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THE ROLE OF AGRICULTURAL EDUCATION AND TRAINING IN IMPROVING THE PERFORMANCE OF SUPPORT SERVICES FOR THE RENEWABLE NATURAL RESOURCES SECTOR

Ian Wallace and Esse Nilsson

Whilst recent research (mainly in sub-Saharan Africa) has indicated a number of successful innovations in agricultural education and training (AET), it has generally been unresponsive to changing patterns of demand for trainees, which are influenced by the changing roles of public and private sectors. Much can be done to improve the design and management of AET, and to strengthen the policy framework through which support and direction are channelled. There is also a need to enhance the interactions between AET institutions and the formal schools sector, as well as AET institutions' linkages with local communities, NGOs and other intermediary organisations. The low level of dissemination of the results of research or of successful innovations has meant that too few new ideas have been flowing into AET.

Policy conclusions

- Clearer policy frameworks for AET are needed in most countries, to provide for coherence between government bodies (including the various NR and Education ministries), donors, NGOs, training institutions and community organisations.
- Investment in AET support should be over sufficient time to permit the innovations introduced and new learning from staff development to become embedded in recipient organisations.
- AET support needs to include measures which build the capacity of organisations to provide leadership and a supportive environment for innovation and introduction of new skills. This will include training in the management of change.
- Acceptance of new learning paradigms is essential to permit the incorporation of indigenous knowledge, more holistic and multidisciplinary approaches to problem solving and greater emphasis on experiential learning.
- Existing/new curricula need to be reformed through involvement of all the key stakeholders, including 'client' groups, and by embracing issues such as gender, environment, sustainability and participatory development.
- Links should be developed between AET institutions or programmes and local resources, including NGOs and CBOs, primary and secondary schools and the

rural communities themselves.

- AET can be strengthened by the adoption of new learning modes and mechanisms, including various forms of distance learning, reformed library services and applications of IT. The results of research also need to be fed more strongly into AET institutions.

Role and importance of agricultural education and training (AET)

AET provides a range of educational activities with the primary aim of achieving human resource development throughout the rural economies of almost all nations. It covers the learning needs of all parts of the renewable natural resources (RNR) sector, including e.g. forestry, fisheries, wildlife and land use management. Typically it has been funded as a public good by the various ministries concerned with RNR and education. Recently there has also been an increasing involvement of private sector training providers: NGOs, parastatals, agribusiness, etc. Donor agencies have seen the support of AET organisations (particularly formal, post-secondary institutions: universities, colleges, institutes) as a key instrument in the strengthening of RNR support services, particularly research and extension. As indicated in Box 1, there are many wider aspects to AET, but the present paper is focused upon the formal pre- and in-service training.

Poor response of formal AET institutions

Recent research, largely restricted to sub-Saharan Africa, has highlighted a number of innovative AET programmes (Wallace and Nilsson, 1997). On the whole, however, the sector is proving slow to respond to the rapid changes occurring in rural economies, resulting from structural adjustment, market liberalisation, new policy initiatives to tackle declining productivity, environmental degradation or demographic changes. Particular challenges for existing AET institutions include the reduction in public sector support services in many countries, combined with the need to meet the new opportunities arising through growth in the private sector (including NGO) involvement in research and extension provision. These changes are accompanied by falling donor and government support for AET institutions, with disruption of training programmes and loss of experienced teaching staff. A further challenge is the low recruitment of women as both teachers and trainees in AET institutions.

Ian Wallace and Esse Nilsson work at the Agricultural Extension and Rural Development Department (AERDD) of the University of Reading, PO Box 258, Reading RG6 6AL, UK.

Tel: + 44 (0)118 9318119

Fax: + 44 (0)118 926 1244

Email: i.r.wallace@reading.ac.uk

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Few institutions have met emerging requirements for:

- offering more transferable skills in preparation for increasingly uncertain and flexible career paths;
- catering for 'niches' such as part-time farming and small-scale rural enterprises;
- incorporating new perspectives, e.g. on sustainability, environment, gender, participatory development and the role of rural people's organisations;
- reaching more vulnerable audiences: the resource poor, women, young farmers, disabled or displaced people.

Factors which inhibit AET performance

- Within many countries there is a lack of a clear policy framework for AET, and inadequate mechanisms to coordinate the several agencies involved, particularly the ministries responsible for RNR training and for education.
- AET institutions are often isolated from extension and research services, and from rural communities themselves.
- Identification of training needs (including rural labour market studies) is often lacking, or the results are not fed into curriculum design processes.
- Curricula rarely adjust to emerging issues (e.g. sustainability, gender, farmer participation in research and extension, changing career patterns), or to local variability. Participation in curriculum review and the evaluation of training by key stakeholders (including researchers and extension workers, farmers, agribusinesses) is still uncommon.
- Many institutions lack the entrepreneurial leadership necessary for e.g. the development of networks and outreach programmes, and the creation of a learning organisation through changes in style, structure and linkages.
- Past support for AET programmes often failed to enhance sustainability and lacked coordination between donors. A clear strategy is needed for capacity building and rationalisation of programmes to meet new opportunities and create new revenue generation capacity (Wallace *et al.*, 1996).

Box 1. AET audiences

- Professionals and sub-professionals who service the rural sector through, for instance, research, extension, agricultural teaching, NGO management, banking, cooperatives.
- Rural producers and their household members.
- Adults in the 'off-farm' sector who support primary production through rural craft skills, small-scale enterprises or marketing.
- Young people receiving vocational education in the RNR sector through e.g. vocational streaming in high schools, youth training centres, national youth services, apprenticeships.
- Children in primary and secondary schools who either learn 'about' agriculture or take subjects such as agricultural, rural or environmental sciences for prevocational preparation.

Contemporary agenda for a responsive AET

The policy framework for AET

A clearer policy framework for AET will improve its responsiveness (see Box 2).

Prior studies are needed of the environment of AET systems, with special attention to areas of integration and communication between ministries involved in the AET on the one hand (Agriculture, other NR, Education) and universities and research institutes on the other. Bureaucratic and hierarchical traditions contribute to the reluctance to change and special emphasis needs to be put on strategies of converting vertical top-down relationships into more horizontal ones. This can be done by:

- introducing people-centred approaches both within training organisations and in outreach programmes;
- training staff in participatory approaches and allowing time for this complex process;
- providing the training managers with improved skills in implementation, monitoring and evaluation, and in communication with other bureaucracies, with employees and with trainees and rural client groups;
- creating a 'critical mass' of change-oriented staff that can contribute to sustainable innovation.

It is necessary to have a clear understanding of the local policy environment within which any investment in AET support is to be located. This includes the need for clarity about national and local aspirations and the prevailing attitudes of the key public sector organisations (e.g. implementing ministries and other agencies) towards the RNR sector. A common difficulty is the mismatch of perceptions about the importance of small-scale semi-subsistence farmers as against modern, commercial farmers. Senior civil servants often equate agricultural education with the creation of a small elite of advanced, export-oriented medium- to large-scale farmers. Further, poor AET project performance is often attributable to inadequate understanding of the needs and perceptions of local communities and institutional target audiences.

Creating the right learning environment

The learning environment is under much scrutiny in AET as in many other sectors. Apart from being dominated by Western concepts of learning and by Western science, AET still suffers from rigid patterns and structures, some of which were laid down in the pre-independence era. It is therefore believed that AET would benefit greatly from introducing more participatory pedagogical approaches. Recent

Box 2. Key policy and strategic issues in AET

- The policy framework for ministries and agencies involved in AET needs restructuring towards more horizontal relationships with clearer people-centred and participatory approaches. There is also a need for improved consonance between donor-funded projects and the local policy environment.
- The learning environment needs to put a stronger focus on participatory and interactive learning styles where indigenous knowledge systems and local values play significant roles. Innovation in educational delivery looks particularly promising.
- Curriculum development needs to involve a wider spectrum of stakeholders and to include more transferable skills as well as gender and environmental education.

alternative learning approaches are also gaining recognition in the sector. These approaches are characterised by readiness to:

- recognise indigenous knowledge systems;
- include local values in the development of curricula;
- link academia and the people more closely;
- allow sufficient time for deeper learning;
- follow an open-ended learning process that can be adapted and improved as experience demands;
- encourage holistic interdisciplinary approaches.

The recognition of indigenous knowledge systems and local values in itself promotes the local capacity and institution building (in ways which resources such as experts, books, computers or scholarships do not). This will in turn add value to local experience and indigenous knowledge, build up confidence in local education systems and thus result in long-term sustainability of institutions in the developing world.

Alternative learning progresses from experimentation and innovation, changing from the traditional classroom approach to interactive and participatory, people-focused methods, but above all it is *learning to be innovative* which represents the central change. A variety of learning approaches, which governments and educational institutions will have to invest in, are therefore needed to create an 'innovative' professional equipped with problem-solving skills and independent thinking to assist and provide services for the whole spectrum of the rural community. Other themes of innovative learning include: developing reflective capacity; networking and interactive communication; experimentation, risk-taking and seeking alternative solutions.

Currently, many alternative strategies are being tried in innovative educational delivery forms throughout the AET sector. The more promising forms include:

- in-service and continuous training for extensionists;
- transfer of higher education from North to South;
- networking and regional workshops;
- learning from and working with NGOs;
- sandwich or split-site training and linkages;
- distance learning;
- part-time courses including elements of distance learning;
- linking educational institutions with rural communities;
- reformed library and information technology services.

Box 3. AET innovations in sub-Saharan Africa

Traditional Techniques of Microclimate Improvement

Funded by the Netherlands government, this programme aims to build the capacity and client-focus of young scientists from national agricultural research services and international agricultural research centres in Africa through supporting split-site PhDs and Masters' programmes with teams of local co-supervisors. The researchers work

on jointly identified problems of low external input farmers to develop their management of micro-climate, described as an 'ethnoscience' approach to the solution of local problems.

Rockefeller Foundation (RF) Forum on Agricultural Resource Husbandry

RF offers competitive grants to staff and graduate students of faculties of agriculture in Kenya, Malawi, Mozambique, Uganda and Zimbabwe to strengthen effective ties between university researchers, government policies and national and international science.

Ghana: Wenchi Farming Systems Development and Training Project

Funded by DFID, this project has involved local trainers in stakeholder analysis, farming systems research and development, use of PRA and participatory curriculum development aiming to incorporate new information from field studies and to broaden the Institute's aims to meet the needs of aspiring farmers and those entering the private sector, as well as future public sector workers. Amongst its achievements are: increased demand from community livestock workers for training; enhanced abilities to communicate with farmers; more demand for short courses and for the one-year certificate course; formation of an effective district agricultural coordination committee.

Namibia: Kavango Farming Systems Research and Extension Project

The main aim of this DFID-supported project is to provide training that will help create the institutional capacity to improve food security and rural living standards, whilst reducing environmental damage. Based on Mashare College, it concentrates on field-based, farming systems R&E, and the training necessary to support them. It seeks to build the abilities of R&E staff and to maximise the involvement of farmers. Successes noted by the mid-term review included: strong farmer participation; women's involvement in selecting collaborating groups and case-study households; increased confidence amongst both women and men farmers; on-farm trials with resource-poor farmers. A reported area of difficulty (common to many AET projects) is that of recruiting and retaining suitable staff.

Botswana College of Agriculture: Centre for In-Service and Continuing Education

This Netherlands-supported project enabled the College to diversify its staff training in response to changing demand patterns. Its mission includes the strengthening of linkages between agricultural research and extension services and training, and the upgrading of all staff from the Ministry headquarters down to the village level. College lecturing staff are required to allocate 20% of their contact time to teaching in CICE on a range of in-service training courses. As well as extension staff, college lecturers and schools' agriculture teachers also receive training in teaching methods. Other departments and agencies also make use of the Centre's facilities.

Curriculum development and participation

If curricula are to be responsive to the changing demands of the market and are to deliver relevant and up-to-date knowledge, as well as a broad range of skills, it is clear that the process of curriculum development should become participatory,

involving all the key stakeholders, including local agro-industry and farming communities. Indeed, the starting point for curriculum development should be stakeholder analysis, in order to identify those who need to be included. Curriculum development should be viewed as an ongoing process, with regular evaluation and feedback from ex-trainees and other stakeholders, and periodic reviews. To include transferable skills such as entrepreneurial ability, language competence, use of computers and IT, communication, PRA/PLA, and management in the curriculum, would benefit trainees and enable them to enter self-employment in farming, or other agriculturally related occupations, either in private commerce or in the growing NGO sector.

Gender is another priority that needs to be included in curricula reforms. Women are under-represented in AET and extension, particularly in proportion to their wide responsibilities in farming. Also there are no guarantees that men transfer agricultural information to their female relatives and it is therefore necessary to train and recruit more women in agricultural extension, who can approach women agricultural producers directly. In order to address the gender imbalance, curricula need to be gender-sensitised and more targeted recruitment policies should be developed to reach women. Some suggestions include special quota systems for women, recruiting the wives of male extension workers (as a means of ensuring continuity of employment when their husbands are sent on transfer), recruiting more women into agricultural research, extension, training and policy making, and training existing staff at all levels in gender analysis and planning.

Another increasingly important area to be included in curricula is environmental education in terms of ecological sustainability, natural resource management, common property management and environmental protection. To make this meaningful, it is necessary for curricula to be based on holistic and interdisciplinary approaches. **Innovative approaches to AET in Africa**

Against this background of weak AET responsiveness, there are an increasing number of examples of innovation which appear to be successful in terms of achieving project objectives and outputs. (To date, impact studies are rare, and there is little measurable impact on broader RNR key indicators.) DFID and other donors have moved away from support of traditional links between institutions in the 'North' and those in the 'South' into more integrated projects which include elements of participatory research and extension, a valuing of traditional knowledge and production systems, the development of networks and more open learning approaches. A number of innovations are outlined in Box 3.

These examples indicate the possibilities of achieving positive outcomes from AET innovations. Some common factors in successful AET innovation were identified:

- an adequate timescale for the embedding of new learning and innovations;
- clear agreement amongst all concerned from the outset about project objectives;
- the building of good relationships and networks;
- placement of highly skilled technical assistance personnel, preferably with backgrounds in social sciences and education;

- a clear commitment to work with resource-poor, small-scale, subsistence households in a participatory manner;
- a supportive environment in the recipient organisations from the policy level downwards.

Future investment in AET

Targeting specific institutions and audiences

In the light of diminishing aid resources, investment in AET ought to be concentrated in relatively few, carefully targeted institutions, in order to ensure sufficient impact both to enhance sustainability, and to provide a critical mass of staff and other stakeholders able to disseminate innovation more widely. Prerequisites include a moderately supportive policy environment and receptive leadership in the institution. In some cases link programmes may still be the most effective means of supporting development, but should be of sufficient length and continuity to allow change to become institutionalised and to be adequately supported.

A particular form of institutional support is the design of split-site PhD and MPhil programmes, as well as joint research and publication that can help to build up professionals' capacities within the region. These need to be accompanied by institutional capacity building, so that newly trained staff can operate in a supportive and affirming environment.

One important target audience for AET is considered to be the senior policy makers in the sector, who are often overlooked in spite of their crucial influence. This is equally valid for the managers of training institutions and of other organisations, such as accreditation bodies. In many cases the most effective training for managers will be short courses, workshops and study visits having a 'management of change' focus, which may be most beneficial, as well as cost-effective, if offered within the region or even home country.

The purpose of much investment in AET is ultimately to achieve better service delivery to rural people. In many instances this will be achieved second- or third-hand, through the training provided for extension staff, or through indirect support for the capacity building of NGOs and CBOs. Wherever possible, donors should seek to promote learning models which lead to interaction between institutions and rural communities and where participatory approaches are both taught and practised. In order to achieve these ends projects need to be of a process nature, with inbuilt flexibility and long time scales.

Creating excellence

Undoubtedly strategic decisions should be taken on the basis that potential for achieving sustainable excellence does exist at the outset of any project, and can be achieved through replication or adaptation of models of success.

The development of linked (e.g. split-site) degree programmes or collaborative research can help promote excellence, provided that they are accompanied by institutional development and that supportive leadership is in place.

Another possibility is to change the role of training institutions' libraries into 'learning resource centres', as part of a programme of institutional development. This would need intensive training for librarians to become 'learning consultants' with a proactive role.

New approaches in teaching and learning

New approaches in teaching and learning is an area of great potential. The adoption of new learning paradigms (interactive learning, the incorporation of ITK, the use of participatory methodologies) has proven successful in the implementation of several recent AET projects. Future investments in AET could usefully be directed towards the creation of 'learning organisations' which adopt these paradigms.

Various forms of educational delivery can be very effective. Distance learning has the advantage of keeping the trainee in the work environment, as does part-time learning. IT can play a significant role in the development of future educational delivery as the expansion of electronic access is spreading rapidly over the world. Already UK institutions, including the Wye external programme, are beginning to offer courses via the World-Wide Web. Donor support in this sector might yield great benefits, provided that a proper framework for an integrated learning system has been put in place.

Linking AET with the formal education sector

Linking pre-service and in-service AET to the school system is an area that has been largely ignored. Communication between agricultural teachers and extensionists can provide a base for interchange of ideas and should be encouraged, as should links between rural schools and local communities. The latter was attempted quite widely in the 1970s and 1980s with limited success, but development of outreach programmes from training institutions could be strengthened by the creation of networks where schools, local NGOs and community-based organisations are involved as intermediaries.

Dissemination and replication

Recent projects have shown the possibilities of 'cascading' AET innovation from pilot schemes to wider application. Dissemination and replication can be enhanced through workshops or the publication of successful project reports. Donors can usefully support regional workshops which enable AET planners and practitioners from different countries to share experiences and research findings. There is a particular case for greater information exchange between Anglophone, Francophone and Lusophone regions in sub-Saharan Africa.

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**Overseas Development
Institute
Portland House
Stag Place
London SW1E 5DP, UK**

**Telephone +44 (0)171 393
1600**

Fax +44 (0)171 393 1699

Email: nrp@odi.org.uk



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