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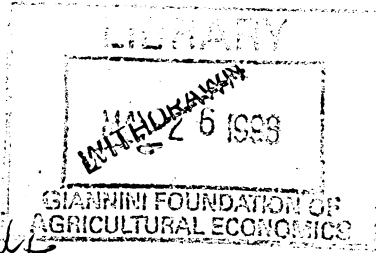
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**LOCAL INSTITUTIONAL LINKAGES IN FARMING  
SYSTEMS RESEARCH AND EXTENSION**

Two Papers by:

G M Heinrich and E Modiakgotla

and

J Uquillas and B Navas

G M Heinrich and E Modiakgotla are FSR/E adviser and Productions Systems Programme Leader respectively, Department of Agricultural Research (DAR), Botswana. G Heinrich can be contacted at:

*5411 Neargate Drive, Huntington Beach, Ca 92649, USA*

E Modiakgotla can be contacted at:

*Department of Agricultural Research, Private Bag 0033, Gaborone, Botswana*

Jorge Uquillas and Bolivar Navas are specialist in Sociology and Evaluation and Specialist in Extension-Education respectively, and can be contacted at:

*FUNDAGRO, The Foundation for Agricultural Development, PO Box 17-16-219 CEQ, Quito, Ecuador*

***Network Personnel:***

Coordinator:	Anthony Bebbington
Assistant Coordinator:	John Farrington
Secretary:	Alison Saxby

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94 Victoria Street, London SW1E 5JL

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# LINKING FSR, EXTENSION AND OTHER DEVELOPMENT ORGANIZATIONS AT THE LOCAL LEVEL: SOME APPROACHES USED IN BOTSWANA

G.M. Heinrich and E. Modiakgotla

## ABSTRACT

The purpose of this paper is to present an approach for improving local level linkages among research and extension institutions in Botswana. The approach is used to strengthen the impact of FSR specifically<sup>1</sup> and agricultural development in general. The primary linkage mechanism has been the Regional Coordinating Committee (RCC), an informal body composed of representatives from a wide range of agricultural development oriented institutions. The paper discusses how these committees function, and type of research-extension collaboration that have stemmed from their work. The RCCs have also improved government-NGO collaboration and coordination, and most importantly a more effective delivery of information and services to farmers. An important factor explaining the RCCs' success is their bottom-up approach to coordination, which stands in contrast with largely unsuccessful efforts to mandate coordination from the centre.

## INTRODUCTION<sup>1</sup>

### Country Location and Environment

Botswana is located in Southern Africa, immediately north of South Africa and west of Zimbabwe. The majority of the population of 1.35 million people is concentrated along the eastern side of the country where the average annual rainfall is about 450 mm. Soils are generally shallow, sandy and low in fertility. The environment could be described as "difficult" for agricultural production.

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<sup>1</sup> FSR/E Adviser and Productions Systems Programme Leader respectively, Department of Agricultural Research (DAR), Botswana. This paper presents the views of the authors, and does not necessarily reflect the views of the DAR.

As a consequence, farmers try to spread their risks by investing in a range of enterprises including livestock, crops and off-farm employment. Roughly 70 percent of the population live in the rural areas.

### **Research Structure**

The great majority of agricultural research activities are conducted by the Ministry of Agriculture, through the Department of Agricultural Research (DAR). The DAR is divided into livestock and crops research divisions and organised through multi-disciplinary research programmes (e.g. the Cereals Research Programme, the Legume and Oil Seeds Research Programme, etc).

Each research programme has a Programme Leader and a programme management committee. These programme committees decide on research directions and priorities and review annual work plans and results. At present, all Farming Systems Research (FSR) in the country is done through the Production Systems Research Programme (PSP). Currently there are PSPs for both crops and livestock divisions, but these are expected to merge.

In the crops research division, PSP teams are located at four regional centres across the country. (None are located at the main national research station near the capital, Gaborone). These teams are responsible for FSR within their regions, and for establishing linkages with extension at the regional level. Each regional team is represented on the PSP programme committee at the national level.

### **Extension Structure**

Extension activities are spread among two departments of the Ministry of Agriculture. These are the departments of Crop Production and Forestry (DCPF), and Animal Health and Production (DAHP). For each of these departments there is a Director at the national level, a Regional Officer in charge of all activities and personnel at the regional level, district supervisors, and an officer appointed for each extension area. An extension area may include well over 500 farm families, so it is often difficult for extension officers to address the needs of all the potential clients in a given extension area.

## **Rationale for Linkages**

The rationale for linkages between various organisations and individuals (e.g. farmers) concerned with agricultural development at the local level, is generally well understood and accepted by FSR practitioners. It stems from the fact that adoption of new technologies and increasing productivity usually requires a broad range of supporting interactions. For example, the adoption of an improved crop genotype requires the development or identification of the genotype (often research), a system to disseminate information about the genotype (often extension), seed producers and suppliers, a transport and communications infrastructure, perhaps a marketing system to handle excess production beyond household needs, etc. In general, no single organisation encompasses all of these different aspects of the development process. Thus it stands to reason that the development process can proceed more rapidly when the organisations involved can act in a coordinated and mutually supportive way. This requires good linkages between the various organisations. Strong linkage systems between research, extension and farmers are particularly important for the development, dissemination and adoption of improved technologies. However, their impact will be increased by linkages with an even broader spectrum of participants in the agricultural development process.

## **Purpose of Paper**

The purpose of this paper is to present a linkage approach now being used at the regional level in Botswana. The approach is used to strengthen the impact of FSR specifically, and agricultural development efforts in general. Examples of how the approach has led to greater interaction among various organisations, the integration of NGOs into government development efforts, and better services for farmers, are presented. The paper concludes with some observations on the effectiveness of the approach and issues related to maintaining strong linkages between participants in agricultural development.

## **LINKAGES AT THE REGIONAL LEVEL**

### **Regional Coordinating Committees**

The primary mechanism for linking FSR and extension activities at the regional level (i.e. regions within the country) is the Regional Coordinating Committee (RCC). An RCC is an informal body composed of representatives from a wide



range of agricultural development oriented organisations. Composition varies between regions, but in the Francistown region for example, the RCC includes representatives from the DAR, DCPF, DAHP, the Botswana Agricultural Marketing Board, the Rural Training Centre, the Department of Cooperatives, the Botswana Cooperative Union, and two community-based Non-governmental Organisations (NGOs). Participants from the DCPF include the Regional Agricultural Officer, District Agricultural Officers, and a representative of a major government equipment-subsidy programme (ALDEP). The RCC is co-chaired by senior representatives from DAR and extension, and a secretary from DAR keeps the minutes. In Francistown the participants decided that quarterly meetings would be appropriate.

The purpose of the RCCs is to develop strong linkages between research and extension at the regional level, and to help ensure that agricultural development within the region proceeds in a coordinated and focused fashion. (Production System Programme, 1991). In general, RCC meetings provide a forum for discussion of annual work plans, progress and results, and to jointly address any major development issues arising in the region. Agenda items are solicited from the participants prior to the meetings. Though informal, the RCCs provide a strong channel of communication between government departments, and allow NGOs to make a more coherent contribution to wider development efforts. The meetings allow participants to identify areas of common interest, avoid duplication of efforts, and to develop mutually supportive activities. At present, where RCCs are operating, most joint activities between government departments and with NGOs at the regional and district levels are initiated through the RCCs.

Government departments commonly have vertical linkages going from the district to the regional to the national level. While the RCCs provide a forum for horizontal linkages across departments at the regional level, they can also take advantage of these vertical linkages. For example, if the RCC identifies a development constraint within the region that requires assistance from a particular department at a higher level, the regional representative of that department may be requested to take the issue to their superiors. This is an additional strength of the RCCs.

#### **Current Level of RCC Activity**

Across Botswana, PSP staff are operating in four regions. They are based in the communities of Pelotshetlha, Mahalapye, Francistown and Maun. The PSP

leader (national level) is stationed in Mahalapye and runs that regional research programme. RCCs have been operating in both Mahalapye and Francistown for some time, but the approach was formally adopted by the PSP committee in April 1991 (Production Systems Programme, 1991). The PSP committee has recommended that they also be started in Pelotshetlha and Maun. Initiatives are now underway in both of these locations.

The RCCs in both Mahalapye and Francistown have led to numerous collaborative activities in both locations, and some examples of these are presented below.

### **Examples of three types of research-extension collaboration stemming from RCCs**

1. One of the main purposes of the RCCs is to allow for the joint identification of priority production constraints within a region. In the Mahalapye region, one of the district extension officers noted that there was a major problem with high soil pH in his district. Though the district (Letlhakane) was a considerable distance from Mahalapye, PSP team members were able to visit the area and help in assessing the situation. Then, together with local extension staff, they devised a farmer-managed, farmer-implemented trials programme to test various ways of addressing the problem. Because of the distance from Mahalapye, the testing programme is supervised by district extension staff, and monitored at intervals by research staff.
2. Another important function of the RCCs is to seek ways in which different departments can collaborate to strengthen each others' programmes. Thus, in the Francistown region, discussions in the RCC have led to considerable research-extension collaboration on in-service training for village level extension staff. In 1991 such training courses covered the topics of: the use of and management of extension oriented farmer groups (EOFGs); soil fertility and soil sampling procedures; and weed control options.
3. The combined use of both horizontal and vertical linkages to address regional production constraints can also be very helpful. For example, in the Francistown region, the district level extension staff noted that farmers were complaining that they could not obtain cowpea seed. Both the Botswana Agricultural Marketing Board and the Department of Cooperatives representatives noted that they were having difficult obtaining

seed from the main government suppliers in the DAR. PSP staff were then requested to approach the relevant persons in the DAR to try and obtain more seed. Though stocks were in short supply in DAR, a small amount of additional seed was obtained.

In a similar case, district extension staff noted that farmers often had difficulty obtaining spare parts for agricultural equipment, and requested the cooperative representative to make greater efforts to ensure that these were more readily available. However, the cooperative representative noted that they were aware of the problem, but that the local equipment manufacturers often did not produce many spare parts after the production of the complete machines. Thus spares were also difficult for cooperatives to obtain. Eventually the Regional ALDEP Officer (in charge of the government equipment-subsidy scheme) was requested to approach her superiors and ask them to bring this problem to the attention of the equipment suppliers.

In both of these cases, the RCC forum allowed local production constraints to be addressed through a combination of both horizontal and vertical linkages.

### **Integrating NGOs in Government Development Efforts**

NGOs can contribute significantly to government development efforts. NGOs are often community based, and have good linkages with farmers. They have access to funds other than from government sources, trained and well motivated personnel, and generally have more flexibility in their activities than government departments. Thus they may have the potential to contribute both human and financial resources to the development process in flexible ways that can focus on the gaps in government programmes. This may be particularly useful in areas where government programmes and departments are resource-limited.

However, to ensure their effective participation at the local level, a system needs to exist which allows NGO activities to be consistent with and, if both sides agree, integrated into government efforts. In Botswana, the RCCs can serve this function. In the Francistown region, two NGOs participate in the RCC. (i.e. The Tutume Brigades in Tutume district, and the Zwenshambe Brigades Development Trust (ZBDT) in the North East district.) The ZBDT has been particularly active, and participation in the RCC has allowed it to become closely involved with research, extension and farmers, to the benefit of

agricultural development in the district. Some examples of collaborative activities are presented below:

1. District extension personnel noted that the lack of an agricultural supplies outlet was preventing farmers from taking full advantage of a government equipment subsidy scheme. The ZBDT, which was already marketing some agricultural inputs, was assisted (by extension personnel) to become a recognised supplier of government subsidised equipment packages.
2. When farmers in an area distant from the ZBDT headquarters complained that they still had no local access to agricultural inputs and supplies, the ZBDT undertook to develop an outlet in a second village. PSP staff assisted the ZBDT to identify donor-funding to build the store. The ZBDT proposal was supported by both research and extension staff in the region, funding was obtained, and the store is now nearing completion.
3. As a community-based organisation, the ZBDT was interested in intensifying agricultural extension efforts in its catchment area. Since village level extension agents are responsible to more farmers than they can reasonably address, it was decided that the ZBDT could usefully assist in the extension process. The ZBDT selected the most resource-limited farmers and female headed households as their target group, and selected the EOFG approach as their extension method.<sup>2</sup>

Both research and extension personnel provided technical advice and assistance in the initial phases of this activity. The ZBDT hired a private extension agent. Though the ZBDT expects eventually to be able to fund the extension exercise through other agricultural enterprises (e.g. a sorghum mill, a tractor hire scheme and the agricultural supplies store), they needed start-up funds to get the programme going. Research personnel assisted in identifying a possible funding source, and in drafting the grant proposal. The ZBDT was awarded a grant of approximately US\$20,000 to start up the project in April 1992. At present the ZBDT is operating four EOFGs, with about 100 farmers. By 1995 they expect to be operating 12 groups with about 360 farmers (Anonymous, 1992).

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<sup>2</sup> EOFG is an extension approach that uses farmer groups as a central focus. The method was developed by research and extension personnel in the Francistown region and is currently in a pilot testing phase in the North East district. It has been described previously in Heinrich *et al.* 1990, and Heinrich *et al.* 1991.

Because the work of the ZBDT has been done in close collaboration with government research and extension programmes, their activities strengthen government efforts, and do not compete with, or duplicate them. The degree of integration is such that farmers' plots from the ZBDT-run groups have been included in extension field-tour programmes, ZBDT staff have assisted in training government extension personnel in the EOFG approach, and the ZBDT extension staff have attended regional in-service extension courses to improve their own agricultural skills.

## DISCUSSION AND OBSERVATIONS

### RCCs as a Catalyst for Linkage Activities

It is common for government departments to have strong vertical linkages from the national to regional to district level. It is much less common for strong horizontal linkages to exist between departments at the regional or district level. The RCCs provide a mechanism for the development of horizontal linkages and act as a catalyst for collaborative activities. As different organisations come to understand what others are doing, areas of commonality and or complementarity are identified. (e.g. one department may be able to assist another with special skills training, etc.). The needs for collaborative action are first identified in the RCCs, and this can lead to planning of joint activities. It is through this process of identifying needs and opportunities that the RCCs act as a catalyst for collaborative action.

### A Bottom-Up Approach

The idea of linking various departments and organisations at the regional level is not new. For example, a similar activity was described recently in Morocco (Elmzouri and Edwards, 1991). In Botswana, early attempts at fostering research-extension linkages took a "top-down" approach. The idea was that once linkages were established at the national level, linkages at the regional level would naturally follow (or could at least be imposed). These attempts, which included establishing a Research-Extension Coordinating Unit (RECU) were not particularly successful. (The RECU no longer exists.) In contrast, though the RCCs were only recently established, they are already having an impact on the level of research-extension interaction, on the orientation of research programmes, and on a range of other activities at the regional and district level. This may be partly due to the fact that regional and district level

officers are operating closer to the front lines of development work. Faced daily with a host of practical problems, the need for collaborative action is readily apparent. In any case, the RCCs represent a "bottom-up" approach, with linkages developing first at the local level, where they are possibly most needed.

### **Informal Versus Institutionalised Linkages**

It is difficult to develop good linkages between separate departments simply by administrative fiat. This is because lines of responsibility are vertical within departments, and the authority of one department does not usually extend to other departments. Hence good linkages will always depend to some extent on the fact that all parties involved perceive it as being in their interests to interact. The approach employed by the RCCs starts with the identification of areas where collaborative activities would be beneficial, and then proceeds with the development of linkages. This approach has been informal, and does not require an "institutional" structure. The question that arises, however, is whether the RCCs are sustainable as a linkage catalyst if they do not have official status as an institution. Our belief is that they are sustainable. This belief is based on several factors. First, regional PSP leaders have been requested to form RCCs by the national PSP committee. Thus regional PSP leaders have a mandate to call such meetings. Secondly, once the RCCs are formed the senior PSP and extension officers, at the regional level, act as co-chairs. Thereafter, meetings may be called by either research or extension personnel. Hence RCC meetings are not solely dependent on the interests of a single officer or department. Lastly, the RCCs do indeed provide a useful forum for addressing local development problems, and in which one department can get assistance from another department or organisation. The fact that they are perceived as a useful activity bodes well for their continuation.

### **RCCs and Research Extension Liaison Officers**

The research-extension liaison officer (RELO) is a linkage mechanism that has been used effectively in some countries (e.g. Zambia. Merrill-Sands, ISNAR, personal communications). In other countries they have not worked well (e.g. Botswana, where the RELO position and RECU have been phased out). While there is much useful work that RELOs can do, problems can easily arise because of institutional arrangements. That is, RELOs are usually members of a particular government department. However, they have the responsibility to work with members of other departments, over whom they have no authority.

Thus they are usually in a position where they have the responsibility to perform certain tasks, but lack the authority. This is a recognised recipe for producing stress.

In some ways, a RELO can also have the effect of making research and extension personnel more distant from each other. If communications between research and extension are largely channelled through the RELO, the communication becomes less direct, with more opportunities for misunderstandings.

The advantages of using RCCs, (in addition to, or in place of, RELOs) are that: (1) once the RCCs are formed, communication between departments is direct; and (2) communication takes place between regional leaders. So, when decisions are taken, the people involved have the authority to implement them within the region.

### **The Net Effects of RCCs**

The initial effect of the RCCs has been to strengthen communication and understanding between the different participants in agricultural development at the regional and district level. They have also provided a format for facilitating links between NGOs and government development efforts.

Products of these effects have been: (1) better linkages and more collaborative activities between research and extension; (2) an enhanced capacity for the delivery of research products to the farm; (3) a more integrated approach to agricultural development at the regional level; and (4) perhaps most important, there has been an improvement in the delivery of information and services to the farmers themselves.

### **REFERENCES**

Anonymous. (1992) *Progress report on the agricultural extension project of the Zwenshambe Brigades Development Trust*. Unpublished report. ZBDT, Private Bag 10, Zwenshambe, Botswana.

Heinrich, G.M. (1989) *Farmer innovation and technology testing for the Gambia*. GARD Report No.50. Department of Agricultural Research, Banjul, The Gambia. USAID Project 635-0219.

Heinrich, G.M., S. Masikara, S. Magalela and G. Moremedi. (1990) *Testing an accelerated extension approach in north east district: the case of extension-oriented farmer groups*. ATIP WP 25, Department of Agricultural Research, Private Bag 0033, Gaborone, Botswana.

Heinrich, G.M., F. Worman and C. Keketso. (1991) *Integrating FPR with conventional on-farm research programmes; one example from Botswana*. JFSR/E: 2(2) 1-15.

Production Systems Programme. (1991) *Production Systems (PSC) meeting. April 10th 1991 Maun*. Unpublished minutes. Production Systems Programme, Department of Agricultural Research, Private Bag 0033, Gaborone.



**LINKING RESEARCH, EXTENSION AND AGRICULTURAL  
EDUCATION: AN EXPERIENCE IN ECUADOR**

**Jorge E Uquillas and Bolivar G Navas**

**GLOSSARY**

<b>AGSO</b>	Asociación de Ganaderos de la Sierra y Oriente <i>Livestock Association of the Highlands and Amazon</i>
<b>CIID</b>	Centro Internacional de Investigaciones para el Desarrollo <i>International Development Research Centre</i>
<b>CIAT</b>	Centro Internacional de Agricultura Tropical <i>International Center for Tropical Agriculture</i>
<b>CIP</b>	Centro Internacional de la Papa <i>International Potato Center</i>
<b>ECAE</b>	Equipo de Capacitación Agrícola de Esmeraldas <i>Agricultural Training Team of Esmeraldas</i>
<b>ESPOCH</b>	Escuela Superior Politécnica de Chimborazo <i>Politechnic School of Chimborazo</i>
<b>FENACAFE</b>	Federación Nacional de Cooperativas Cafetaleras <i>National Federation of Coffee Producing Cooperatives</i>
<b>FUNDAGRO</b>	Fundación para el Desarrollo Agropecuario <i>Foundation for Agricultural Development</i>
<b>INIAP</b>	Instituto Nacional de Investigaciones Agropecuarias <i>National Institute for Agricultural Research</i>
<b>MAG</b>	Ministerio de Agricultura y Ganadería <i>Ministry of Agriculture and Livestock</i>
<b>PNC</b>	Programa Nacional del Café <i>National Coffee Programme</i>
<b>PROTECA</b>	Programa de Desarrollo Tecnológico Agropecuario <i>Programme for Agricultural Technology Development</i>
<b>RELU</b>	Research Extension Liaison Units
<b>UCIG</b>	Unión de Comunidades Indígenas de Guamote <i>Union of Indigenous Communities of Guamote</i>
<b>UATAPPY</b>	Unión de Asociaciones de Trabajadores Productores y Procesadores de Yuca <i>Union of Cassava Producers', Processors' and Workers' Associations</i>

## ABSTRACT

Poor links between research, extension and education, and the failure of formal research to generate knowledge that is then incorporated into farming practices are serious obstacles to agricultural development in Ecuador. This paper discusses how one organisation - Fundagro - was created in order to address these two problems. In particular the paper concentrates on Fundagro's efforts to improve coordination among different research, extension and education institutions at a local level. Initially, Fundagro aimed to create semi-formal bodies called Research-Extension Liaison Units which allow institutions to coordinate activities and plans. However, these formal committees have not always functioned well, for reasons discussed in the paper - especially inter-institutional competition. The most successful experiences have been where Fundagro has also assisted the emergence of strong farmer organizations which have then taken on a more active role in promoting local institutional coordination. Several experiences are discussed.

## INTRODUCTION: PROBLEMS OF AGRICULTURAL DEVELOPMENT IN ECUADOR

Over recent years a number of studies on the Ecuadorian agricultural sector have argued that one of the causes for stagnation or, at the very best, slow growth is to be found in misdirected policies. These, it is argued, have focused on the expansion of agricultural and livestock area rather than on increases in yields. Several authors have argued that the solution to this problem lies in a strategy of increasing production and raising productivity through the application of science and technology to the solution of agricultural problems and the removal of constraints on production (Joint Ecuadorian North Carolina Subcommittee, 1987; Peterson et al, 1990, Whitaker, Collier and Alzamora 1992). These studies have deemed this scientific capacity weak in Ecuador.

At the same time, these studies have highlighted the lack of linkage among a range of institutions involved in agricultural development as a further constraint on the Ecuadorian agricultural sector. These inter-institutional breaches have been between:

- a) those institutions concerned with agricultural research
- b) those public and private sector institutions which are concerned with extension and

- c) those concerned with higher education in agricultural sciences.

Furthermore, each of these institutions has been isolated from each other with negative effects on agricultural producers who, at best, have only had very incomplete awareness of advances in formal agricultural knowledge (Joint Ecuadorian-North Carolina Subcommittee, 1987).

This lack of linkage has occurred both at a national level as well as locally. Aside from meaning that information fails to move among different institutions, such poor linkages will also mean that any attempt to develop the scientific capacity of the research sector will have little impact on extension or education, and in turn be of little benefit to farmers. Similarly, the lack of linkage between Farming Systems Research (FSR) projects and educational institutions means that the professionals leaving these institutions are not sensitive to systems issues and approaches.

## **FUNDAGRO AND THE PROBLEMS OF ECUADOR'S AGRICULTURAL SECTOR**

Given the problems identified by the studies of Ecuador's agricultural sector noted above, the principal strategies that FUNDAGRO has used to promote higher agricultural production and productivity have been to promote links between research extension and agricultural education, and to enhance the scientific and technological capacity of national institutions. In the process of pursuing these goals, the approach has gone beyond one that focuses simply on production, to include important social and economic components which have been geared towards a more integrated vision of agricultural development. Some of the characteristics of this approach are analysed below, before we focus in particular on the ways in which FUNDAGRO has sought to foster local research-extension linkages.

First, however, it is necessary to explain the origins of Fundagro as an institution, because they are related to the approach it has taken, and to these diagnoses of the agricultural sector to which that approach is responding.

### **The Origins of Fundagro**

Fundagro was created during the latter part of the 1980s as a result of these diagnoses of the agricultural sector. It was felt that the existence of a private

foundation with funds available to support the work of public and other institutions in the agricultural sector would help foster greater coordination among these institutions. The existence of a relatively well-endowed private foundation would also encourage, it was believed, the development of more innovative approaches to agricultural research, extension and education.

Fundagro was established to be such an organisation capable of stimulating flows of technology, creating linkages and co-ordinating the various agencies involved in the agriculture sector. It was created on the basis of: (i) the inheritance of a large project financed by the United States Agency for International Development (USAID) and (ii) an endowment from USAID. The projects inherited themselves dealt with agricultural research, extension and education, and were already aiming to improve linkages between the different institutions involved in these activities.

Together, the endowment and the projects gave Fundagro a stable income base from which it could launch other initiatives. In subsequent years, this stable basis has allowed FUNDAGRO to gain access to additional financial support. In all cases, however, it is not the intention that this financial support be used by Fundagro so that it itself implements programmes: rather the programmes are implemented by other agencies to whom Fundagro channels these resources. These are intended to be programmes that aim to be:

- agricultural development endeavours
- exercises in strengthening national agricultural institutions
- part of a learning process in which new approaches to agricultural development are elaborated.

At present Fundagro manages research and extension projects in both the highlands and coastal lowlands, and in a range of production systems, including systems based on soft maize, potato, coffee, dairy cattle-potatoes, and cassava.

#### **Fundagro's approach to agricultural research, extension and education**

Among the central pillars of Fundagro's approach to agricultural development have been support for national agricultural research institutions (to develop scientific capacity in Ecuador), the promotion of on-farm and systems approaches to agricultural research extension (as a means of increasing the

relevance to farmers of the results of science), and the elaboration of innovative and participatory approaches to agricultural extension (ensuring that those results find their way to farmers).

## **1. Support to agricultural research institutions**

Given the lack of proven technological solutions to many of the problems of agricultural development in Ecuador, FUNDAGRO has allocated a large part of its technical and financial resources to strengthening agricultural research in the National Institute for Agricultural Research (INIAP). At the same time it has promoted institutional and policy changes in INIAP. On a smaller scale, resources have also been allocated to universities and private research centres.

Support to INIAP has been at several different levels but most significantly in the area of on-farm research or validation trials of technology within the context of a farming systems approach. To this end, teams have been created (where they did not exist) or strengthened where they did exist. Fundagro now supports teams in projects based on maize, potato, cassava, coffee and dairy cattle.

Partly to obtain technical support and partly in pursuit of inter-institutional collaboration FUNDAGRO has also established contacts and, in some cases, formal agreements with a large number of national and international organisations. It has formal collaborative agreements with more than forty organisations. The majority of these are at a national level; in others there are varying degrees of interaction with international research centres, universities in the United States and Europe and international development agencies and foundations. Through these collaborations Fundagro can channel the technical and professional expertise of these institutions to INIAP and other national institutions.

## **2. The transition from a commodity approach to a systems approach**

When FUNDAGRO was first established its strategy was to focus on a number of products or disciplines. Its first large project focused on the improvement of production technology for coffee, dairy cattle and the production and processing of cassava. Nevertheless, after a short time, it began to move towards a farming systems approach.

This shift has been progressive, and as the conception of "system" has widened, so the number and range of institutions that have linked locally. Initially, Fundagro worked with a production systems focus at a farm level, which implied improving links between INIAP's on-farm research programmes, its commodity programmes, and the Ministry of Agriculture's (MAG) extension services. Soon, however, Fundagro began to incorporate nutritional objectives into its programmes, using them as one of the key variables on which the impact of projects are monitored and evaluated (DeWalt and Uquillas, 1989; Leonard et al, 1993). This in turn has led to emerging linkages with university Faculties of Nutrition. It has also encouraged an explicit focus on working with women. Increasing their income generating possibilities - as well as their knowledge of the nutritional qualities of different food crops - is an important means of improving the nutritional impact of Fundagro's technology generation projects.

More recently, Fundagro's projects have begun to incorporate off-farm interventions into their programmes, linking them to research and extension activities. Projects have branched out into seed production, processing, credit systems and marketing. Some of the most notable efforts in this area include the installation of a cheese processing plant in Salcedo, of cassava and coffee processing equipment in Manabí, a farmer managed credit system in Guamote, and of sales facilities for organically produced vegetables in Pichincha. This move towards a regional food systems approach necessitates more within-region linkages between different institutions, and has in some cases led farmers organizations to play an important role in this coordination - a point to which we return.

### **3. Community Participation, Farmer Organisations and Agricultural Extension**

#### **3.1 *Community participation, farmer organisations and targeting extension to small farmers***

Levels of community participation in Fundagro's projects have recently increased substantially. For example, project evaluations have recently included a component of participatory peasant evaluation in which the beneficiaries themselves evaluate the project and the agencies which have implemented and co-ordinated it (Hudgens et al.1991). As a result of community participation of this kind a number of organisations have gradually gained control of the projects in which they participate, and have begun to take decisions about their future (Bebbington, 1993; Poats, 1993).

FUNDAGRO has had considerable success in its work with grass roots organisations both at community level and among organisations of producers, processors and agricultural labourers. It has not been successful when it has aimed to support small farmers via projects with umbrella organisations which nominally represent both small and well-resourced farmers, but which in practice are controlled by larger farmers. A number of USAID funded projects in Ecuador have been similarly unsuccessful in their relations with umbrella organisations (Jones 1985; Hudgens et al.1991). Umbrella organisations at first accept the role of serving as intermediaries for the transfer of resources and technology to small scale producers at the same time as channelling support to larger farmers. Even at this initial stage they have serious limitations - such as the indifference or obstructive behaviour of leaders (Jones, 1985). In the end, however, these umbrellas often simply transfer these resources to a small group of their own large farmer members. Furthermore their economic and political importance gives them the weight to resist supervision and control of their activities by Fundagro - or other funding organisations.

### *3.2 From participation to active beneficiary involvement*

In some cases where Fundagro has worked directly with small farmer organisations, those organisations have become increasingly active participants. Peasant self-determination has been particularly strong among federations or associations of grass roots organisations such as for example UATAPPY (the Union of Cassava Producers', Workers' and Processors' Associations) and UCIG (the Union of Indigenous Communities of Guamote).

Over time the leaders of these federations have exerted increasing control over their own organizations, and over the technical and administrative aspects of project management. This active involvement has greatly facilitated extension work, with peasants playing a pro-active role in problem identification, the preparation of annual work plans and the implementation and evaluation of the various project activities. This experience has convinced FUNDAGRO that projects with a high degree of peasant participation have been the more successful.

There seem to be several reasons for this. Active involvement is stronger where Fundagro has worked with existing organizations (rather than creating new ones), and has benefitted from the provision of training support tailored to suit the requirements of farmers, the staff of the organizations and the peasant extensionists (*promotores*) drawn from the peasant community. Training has

dealt not only with agricultural technology, but also farmer organisation and marketing of selected products.

### 3.3 *Credit, extension and organisations*

As part of the emerging regional food systems focus in Fundagro, some projects have begun to link research and extension in particular crops with the availability of credit - both in kind and in cash. In the case of UCIG, this credit in kind scheme (in potato seed, inputs, guinea pigs) is now largely administered by the peasant organization, and has become part of the process of organizational strengthening.

## 4. Links between research and extension

### 4.1 *Inter-institutional co-ordination committees*

As noted, a central objective to FUNDAGRO's agricultural development projects has been the integration of research, extension and agricultural education. FUNDAGRO essentially acts as a catalyst, identifying opportunities for integration of different institutions. Its role is then to ensure that the collaborating institutes address specific aspects of the projects. Formal agreements are signed to underpin inter-institutional co-operation as also are letters of intent in relation to specific projects.

In the original projects inherited from USAID it was envisaged that this integration would be pursued through local inter-institutional committees for coordinating between research and extension. These coordinating committees were titled Research Extension Liaison Units, or RELUs (Figure 1). Although research extension liaison units have been widely used in other countries, in Ecuador they have come to be regarded as a substantial innovation. The idea behind them is to facilitate inter-institutional collaboration within projects.

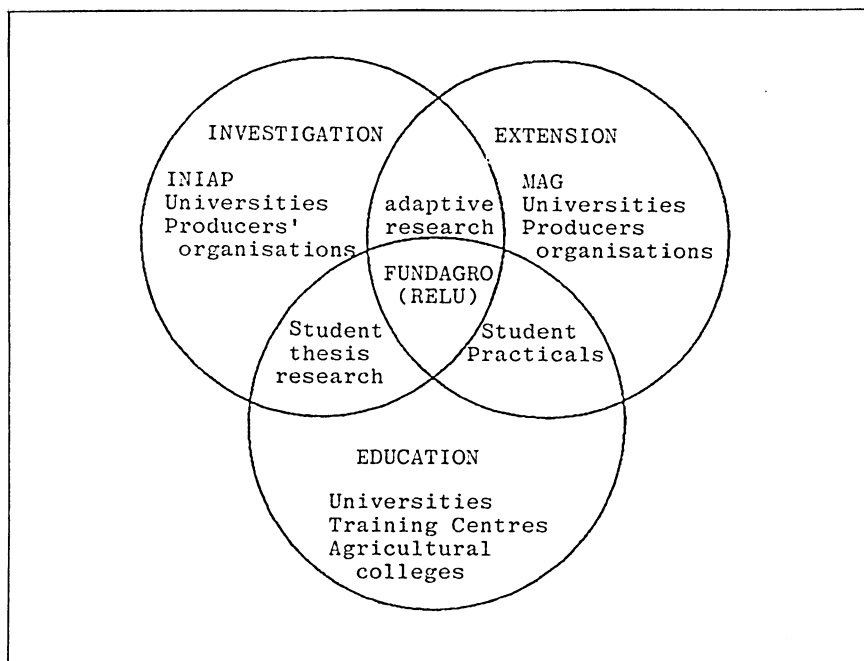
Adopting this model, FUNDAGRO has used these RELUs in all its programmes. While the RELU had something of a blueprint in its initial conception, the experience has been that the final form taken in such coordination units has varied among projects. The quality of that coordination has also been variable.

In the blueprint for the RELU, the principal collaborating agencies would be represented, and would represent particular functions or interests. Thus, RELUs have typically brought together INIAP (research), the Ministry of Agriculture



(extension), Integrated Rural Development Projects (extension), local universities (education and extension), and farmer organizations. The representative of FUNDAGRO serves as project co-ordinator and as secretary to the RELU and the presidency rotates among its members.

Figure 1: The model for linking research/extension/education in FUNDAGRO



Source: Hudgens, *et al.* 1991.

The mandate of the RELU covers the identification of problems and of appropriate technologies, the search for technological solutions, planning, project preparation, the promotion of technical training, co-ordination of research, extension and agricultural education among the participating institutes (Dousdebés *et al.*, 1988). The RELU is also intended to be a forum in which the different institutions can discuss their work and how best to respond to emerging farmer and project problems. Crucially, the RELU would allow coordination and forward planning of field activities.

For this to occur, the coordinating committee must, however, meet regularly, and the institutions involved must all wish to continue coordinating. They must also be coordinating with the same ultimate goal in mind. It is also clear that the professional and personal skills of the Fundagro coordinator are of paramount importance (see below).

In two cases (coffee and cassava projects), the committees have operated relatively well. Projects co-ordination committees have met on a regular three monthly basis or whenever the president or secretary has called extraordinary meetings. The relatively effective functioning of the cassava committee reflects the success of the project, and the strong commitment of Fundagro to this particular project.

However, even in these successful cases, some organizations have ceased to coordinate, and others have been able to offer little to the projects because of their scarce resources. In the coffee programme, extension was initially the responsibility of the large producers' organization, FENACAFE and small producers' organisations such as UOCAM and ECAE. But a combination of weak coffee prices and high wage demands by technical staff meant FENACAFE's could not cover the costs of providing technical assistance and so withdrew from the project to be replaced by a government organisation, the National Coffee Programme. Similarly, whilst the technical universities of Manabí and Babahoyo have continued to coordinate with other institutions, both have played a relatively modest role because of their limited capacity to implement field activities.

In other cases, the RELU has been less successful. At the creation of FUNDAGRO it had been anticipated that the former USAID projects would by 1991 have RELU's functioning as formal organisations under the leadership of specialists charged with maintaining links between research, extension and agricultural education. Yet an evaluation found that inter-institutional co-ordination committees existed more in rhetoric than in reality and had become nothing more than periodic meetings of the principal agencies participating in each project as a forum for exchange of views and the discussion of co-ordination problems. There was no joint planning to address farmer's problems. The effectiveness of the committees depended greatly on the quality of leadership given by the FUNDAGRO co-ordinator, (Hudgens et al.1991). It has become clear that it is less important that these coordinators be specialists in the principal crop or animal elements of the project. Far more important is that they have see their work as one of socio-economic development and not merely agricultural research and extension. Similarly, a good coordinator must have a

personal and social commitment to the rural poor, and be able to establish good working relations with people, and on that basis be able to seek out opportunities for collaboration which promote project goals. A readiness to match project resources with objectives is also essential. Where the coordinators have not been of this nature, the local coordinating committees have not worked well.

A further source of weakness in these committees derives from a certain competitiveness among the institutions involved, poorly defined decision making responsibilities, and unclear project objectives. In one of its highland programmes in the provinces of Chimborazo and Canar, committees functioned well initially, but largely because different institutions saw the project as a means for them to gain access to resources and increase their presence in the countryside. By the second year, however, the committees ceased to function and increasingly Fundagro rather than the institutions became responsible for organizing activities. One reason for this was the uncertainty over whether Fundagro's coordinators or the presidents of the committees were responsible for the management of the project. This created ill feeling, and as Fundagro asserted its control over project management, the committees ceased to function. A second reason was that the participating institutions had understood the prime objective of the project to be the strengthening of their institutions: when they discovered that they were receiving few resources from the project their interest waned and they also felt resentful at what they saw as having been misinformed. Either way, their participation in the committees declined (Bebbington, 1993).

The demise of the RELUs in this project did not mean coordination ceased. However, it became bilateral rather than multi-institutional - Fundagro established separate relationships with particular institutions.

It has also become apparent that the dynamics and strength of the farmer organization involved in the RELU has a significant influence over the effectiveness of inter-institutional linkages. For example in the case of a dairy programme in the Central Highlands, while on-farm research was well supported, it failed to develop strong links to extension because the organization given responsibility, AGSO, was an umbrella organisation representing large scale cattle producers. This led to differences in perception between this and other organisations, which in turn has led to a declining frequency of meetings.

In other cases, a strong peasant organization can significantly improve coordination, though it may cause problems in the short term. In the cassava programme, MAG was initially responsible for extension and the creation of

user groups. Since then its participation has diminished over time to the extent that it no longer takes part in co-ordination meetings. This, however, did not lead to a breakdown of research-extension linkages because the federation of producers' associations, UATAPPY, was strong enough to take on responsibility for extension, providing peasant extension agents.

Similarly in the Chimborazo and Cañar project a strong peasant organization (UCIG) has ultimately led to improved coordination. Initially this was not so, as other institutions resisted the increasing assertiveness of UCIG and its demands to exercise increasing control over the programme. Indeed, when it became clear that Fundagro supported the position of UCIG, the committee began to lose interest and met less and less frequently (Alvarado 1992).. However, in time, as UCIG has taken control of the part of the programme in its own area, it itself has served as the axis through which research and extension are coordinated. It now employs its own extension expert and a team of peasant extensionists, runs credit and marketing programmes to support their work, and established a strong link with INIAP for input on research and seed production. In essence, a strong peasant organization has replaced the RELU - and made the new coordinating mechanism far more participatory (Bebbington, 1993).

#### *4.2 Other integration mechanisms*

While most attention has been paid to the RELU as a means of promoting links between institutions, in addition, and with considerable success, partial linkage mechanisms have also been used between the different components of the system. While the RELU promoted linkages among each of research, extension and education, partial mechanisms have fostered linkages among just two of these areas (Figure 1).

Thus, integration between research and extension has occurred in adaptive trials. Linkages between research and education have been promoted by supporting student thesis work oriented towards particular problems in the projects. Integration between extension and education has also been promoted by taking on students for the one year of practical training they required for their degrees. This exposes these students to the perspectives of more systemic approaches on agricultural development.

Linkage mechanisms frequently encountered at an international level have also been used (Thiele 1992, Bebbington and Thiele, 1993, Merrill-Sands and

Kaimowitz 1989). For example there have been a number of joint inter-institutional studies and publications, and joint work also in planning, project evaluation and training. Research priorities were jointly established and technical staff were involved in exchange visits from one institution to another for up to two years. These joint activities have helped create both formal and informal contacts between research, extension and education institutions that in turn have allowed informal and formalised coordination of activities.

Furthermore the research-extension-education strategy has also adopted other linkage mechanisms between research and extension at field level such as, for example, weekly meetings of technical staff and peasants from participating organisations and joint fieldwork activities in which representatives of the principal development organisations in the area participate.

In the Chimborazo and Cañar project routine co-ordination meetings (as opposed to the planning meetings of the RELU) were held on a weekly basis, providing a forum for discussion of progress on individual project components. In these meetings, institutions were represented not by their senior management but by field staff and peasant leaders. Further effective interaction took place on the farms of producers themselves both in researchers' validation plots and in extensionist demonstration plots and also on the experimental plots of farmers themselves or in training activities conducted as part of the project. These meetings have been a much more effective than the more formalised meetings of the RELU (which involved senior staff) for improving the mutual confidence and commitment of field staff of different institutions.

These more routine and informal linkages between institutions have also been the most effective way of deepening institutional responsiveness to farmers' needs, and respect for their knowledge systems. Perhaps the best illustration of this was in a maize based systems project where researchers and extensionists ended up learning from peasants the value of their traditional technology and above all the properties of native varieties of maize. Researchers and extensionists then sought to complement this indigenous technical knowledge with appropriate technologies from a formal research system - such as the preparation of compost and organic manure, the use of silage, and seed selection and storage.

## CONCLUSIONS

In its efforts to strengthen local linkages among institutions within farming and food systems approaches to agricultural development, FUNDAGRO's first objective has been to strengthen the adaptive and on-farm farming systems research work in INIAP. This has been the basis for other inter-institutional linkages that have brought extension and educational institutions into the project process. On the basis of experience, the remit of these systems approaches, and thus of the linkages, has become broader, as Fundagro has moved towards a focus on on-farm/off-farm linkages, and a different kind of systems approach based on the entire product processing and marketing chain - themes that must be taken into account if rural people are to enhance their capacity for capital accumulation.

The experience with formalised mechanisms for promoting these local linkages has been variable. While these local coordinating committees can make planning more effective across a range of institutions, they have often been weakened by inter-institutional competition. Although these are still early days, it would seem that the deficiencies that result from this can be offset when a strong peasant organization assumes a more proactive and coordinating role. This allows it to replace some of the activities of those institutions that chose to withdraw from the coordinated activities - either through its own work (as in peasant extension agents) or by contracting in particular services. A strong and proactive organization also strengthens peasant participation in the process of agricultural development.

However, although the inter-institutional co-ordination committees have been working only very irregularly and have not fulfilled original expectations, increasing collaboration between research, extension and agricultural education has occurred through other mechanisms. Such mechanisms include adaptive trials and demonstration plots in farmers' fields where researchers, extensionists, university students and farmers themselves have the opportunity to exchange experiences and knowledge.

Overall, the message of Fundagro's experience is twofold: local linkages can increase the relevance and impact of systems oriented projects, but the management of these linkages is not straightforward. It can easily be upset by institutional competition, misunderstandings and insensitive handling of human relations by project coordinators.

## REFERENCES

- Alvarado, F. (1992) *Evaluación de las Cajas de Crédito en Especie en el Proyecto Kellogg-Papa, en las Zonas de Guamote, Colta y Cañar*. Periodico 1989-1992.
- Bebbington, A., M. Praeger, H. Riveros y G. Thiele. (1993) *Generación y Transferencia de Tecnología Agropecuaria: el Papel de las ONG y el Sector Público*. Cali, COL: CELATER, ODI, CIAT.
- Bebbington, A.J. (1993) *Informe de Evaluación Externa del Proyecto de Validación y Transferencia de Tecnología en Sistemas de Producción Alrededor de Papa*.
- Bebbington, A., P. Davies, M. Prager and H. Riveros. (1993) *Non-Governmental Organizations and the State in Latin America: Rethinking Roles in Sustainable Agricultural Development*. London/Routledge.
- Byrnes, K. (1993) *A Case Study on the Organization and Financing of the Agricultural Research Program of the Eduacorian Foundation for Agricultural Development (FUNDAGRO)*. Washington, D.C: USAID.
- De Walt, K. and J. Uquillas. (1989) 'Potato production and consumption in the Sierra of Ecuador: a diagnostic survey conducted by the Nutrition and Agriculture Cooperative Agreement.' *Culture and Agriculture*. 39 (Fall/Winter).
- Dousdebés, T., P. Espinosa, F. Muños, B. Navas, J. O'Donnel and J. Uquillas. (1988) *Research, Extension and Education (REE) Project*. Quito, EC. FUNDAGRO.
- Hudgens, R., L. Van Crowder and D. Bostwick. (1991) *Cross Cutting Evaluation of Research, Extension and Education in Ecuador* Quito, EC: USAID.
- Joint Ecuadorian North Carolina Subcommittee. (1987) *A strategy to accelerate the application of science to increase the productivity of Ecuadorian Agriculture*. Quito, EC.
- Jones, J. (1985). *Five months with the Asociación de Productores de Cultivos de Ciclo Corto (APROCICO) Subproject in Quevedo, Ecuador: A report of experiences*.

Leonard, W., K. De Walt, J. Uquillas and B. De Walt (1993) 'Socioeconomic and ecological determinants of dietary consumption and nutritional status in highland and coastal Ecuador' forthcoming in *Ecology of Food and Nutrition*.

Merrill-Sands, D. and D. Kaimowitz. (1989) *Linking Farmers, Technology Transfer Agents, and Agricultural Researchers*. La Haya, HOL: ISNAR.

Peterson, W., O. Zuloaga, B. Swanson, J. Uquillas and Ch. Crissman. (1988) *The Potato Technology System in Ecuador* INTERPAKS-CIP-FUNDAGRO.

Poats, S. (1993) *Conceptos de género y sistemas agropecuarios*. Presentada en el Simposio Latino-americano sobre Investigación en Sistemas Agropecuarios. Quito, EC: Marzo 3.5.

Thiele, G. (1992) *Mecanismos de enlace para el relacioamiento entre los Servicios Nacionales de Investigación Agropecuaria y las Organizaciones no Gubernamentales* Pages 161-202. In Bebbington, A., M. Praeger, H. Riveros and G. Thiele, *Generación y Transferencia de Tecnología Agropecuaria: el Papel de las ONG y el Sector Público*. Bogotá, COL: CELATER, ODI, CIAT.

Whitaker, M., D. Colyer and J. Alzamora (eds). (1990) *The Role of Agriculture in Ecuador's Aconomic Development: An Assessment of Ecuador's Agricultural Sector* Quito, EC: IDEA.



Overseas Development Institute  
Regent's College  
Inner Circle  
Regent's Park  
London NW1 4NS, UK  
Telephone: +44 71 487 7413  
Fax: +44 71 487 7590  
Telex: 94082191 ODIUK