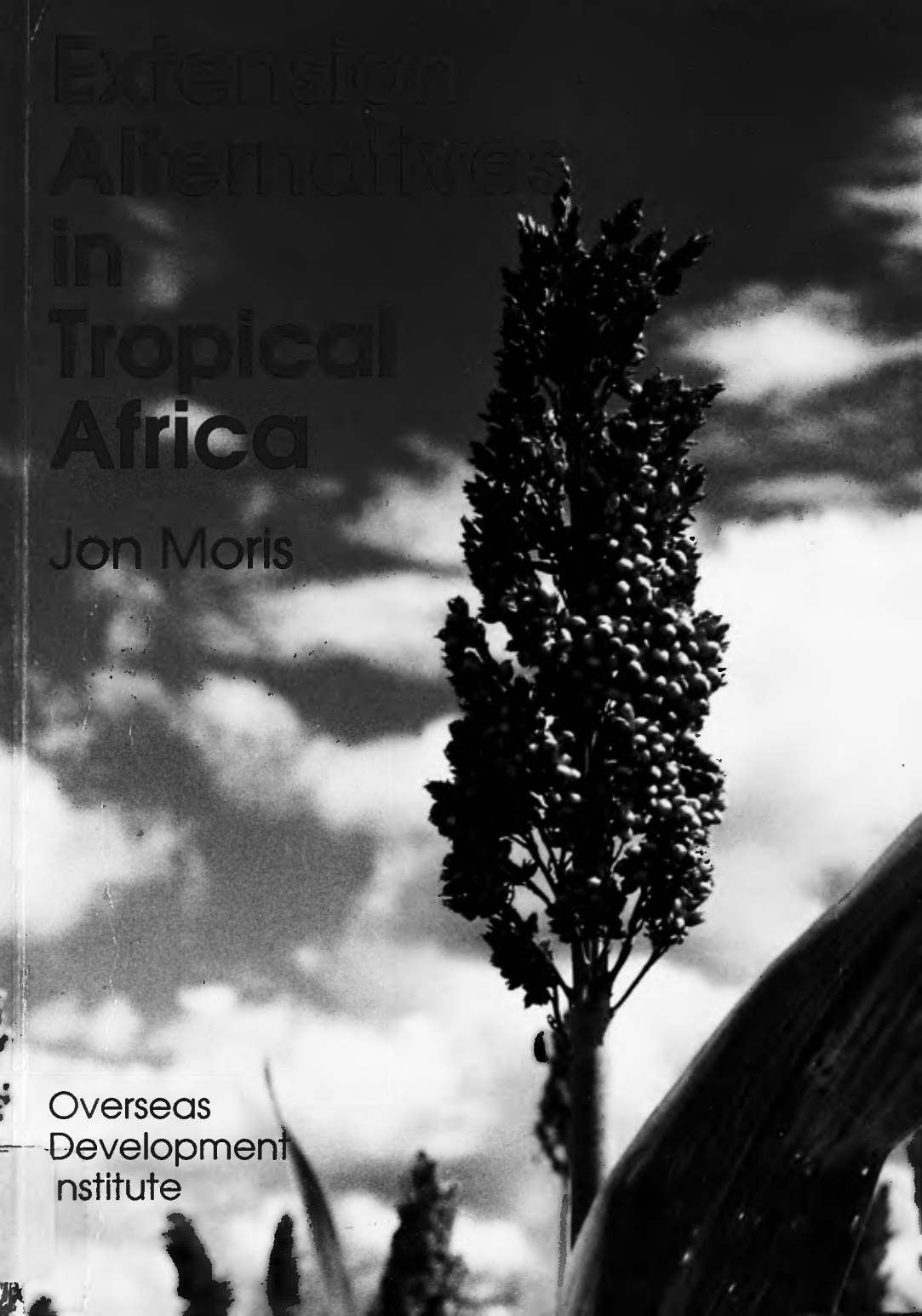
Extension Alternatives in Tropical Africa

Jon Moris



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Agricultural Administration Unit

Occasional Paper 7

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British Library Cataloguing in Publication Data:

Morris, Jon, 1939-
Extension alternatives in tropical Africa.
1. Tropical regions. Agriculture
I. Title
630.913

ISBN 0-85003-105-2

Published by the Overseas Development Institute, Regent's College, Inner Circle, Regent's Park, London NW1 4NS

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Dedication

To Guy Hunter
in appreciation

Preface

This paper originated from a review of African extension based on field visits in 1983-4 to Kenya, Sudan, Malawi, Somalia and Tanzania, and supplemented by other visits to Mali, Niger, Nigeria, Zambia, and Zimbabwe. At earlier periods I was a project manager of the Maasai Range Development Project (1973-6) under the Tanzania Ministry of Agriculture, and also Professor and Head of the Department of Agricultural Education and Extension in Tanzania's Faculty of Agriculture at Morogoro, Tanzania (1976-9). A first draft report was presented at an FAO expert consultation held at CIRDAFRICA, Arusha (6-10 October 1986), but has been completely revised for publication.

In the years since 1984, the questions examined in the original FAO paper have become even more salient for African governments. Western donors continue to press for a restructuring of field services through privatisation and greater NGO involvement. Field agencies, for their part, discover that virtually all their resources are absorbed into the payment of staff salaries, which in many countries no longer provide a living wage because of rampant inflation. This context leaves little scope for conventional reforms, unless they are fully underwritten by external donors (e.g. the World Bank's 'training and visit' system). The debate has been dominated by financial considerations without regard for how extension systems really work in an African context. This book explores how a knowledge of field constraints should inform and guide the policy choice between alternative institutional structures in contemporary Africa.

It is not intended as a substitute for a general review of rural extension, of which there are several excellent texts (Adams 1982, Hawkins et al. 1982, Roling 1988, Swanson 1984, van den Ban and Hawkins 1988). Instead it draws on my own experience during twenty-five years spent either in Africa or in close association with

African development projects and programmes. While as a consequence the examples tend towards Eastern Africa, they have been chosen to represent problems encountered throughout the continent. Any quotations are approximations of longer conversations held with personnel actually working in the field.

Finally, an apology is owed to those who have waited for this publication during the past three years. The delay has been my own responsibility, brought about because of more pressing commitments; I believe, however, it has resulted in a better paper than the one I wrote in 1986. Special thanks are owed to Jane Horsfield, Marcia Mickelsen and Margaret Cornell for the huge amount of work in getting this account ready for publication.

Acronyms

AAU	Agricultural Administration Unit, ODI, London
BAT	British American Tobacco Company, Kenya
CFA	The common currency used in Francophone countries
CFDT	Compagnie Française pour le Développement des Fibres Textiles
CGIAR	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Centre, Mexico
CIP	International Potato Centre, Peru
DAO	District Agricultural Officer
FAO	Food and Agricultural Organisation of the United Nations
FSR	Farming systems research
FTC	Farmer training centre
HYV	High yielding varieties
ICRAF	International Council for Research in Agroforestry, Nairobi
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics, India
IDRC	International Development Research Centre, Ottawa, Canada
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development, London
IITA	International Institute for Tropical Agriculture, Ibadan
ILCA	International Livestock Centre for Africa, Addis Ababa
ILRAD	International Laboratory for Research on Animal Diseases, Nairobi
IMF	International Monetary Fund
IRD	Integrated rural development

IRDP	Integrated rural development programme/project
IRRI	International Rice Research Institute, Philippines
ISNAR	International Service for National Agricultural Research, Holland
KTDA	Kenya Tea Development Authority
MOA	Ministry of Agriculture
MSU	Michigan State University, USA
NARS	National agricultural research service
NGO	Non-Governmental Organisation
ODA	Overseas Development Administration, Great Britain
ODI	Overseas Development Institute, London
OFCOR	On-farm Client-oriented Research (ISNAR)
OFR	On-farm research
ONAHA	Office National des Aménagements Hydro-Agricoles, Niger
RTC	Rural training centre
SAED	Société d'Aménagement et d'Exploitation des Terres du Delta, Senegal
SEMRY	Société d'Expansion et Modernisation de la Riziculture de Yagoua, Cameroun
SIDA	Swedish Agency for International Development, Stockholm
SMS	Subject matter specialist in the T & V system
T&V	Training and Visit extension system
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development.

1
Why Alternatives?

The traditional concept of agricultural extension sees it primarily as a means of information delivery to farmers, a function related to the transfer of officially sponsored technologies being promoted by a commercial firm or a government ministry. Twenty years ago anyone writing about 'extension alternatives' would have dealt mainly with questions of *methods:* mass media vs farm visits, individual vs group approaches, and so forth. Today, however, 'alternatives' are understood to relate to more fundamental matters such as the functions of agricultural extension, the type of agency established to carry out these functions, the task environment, the resources provided, and the linkages to other units within a common process for deriving, adapting, and diffusing new technologies.

The need to take a broader view derives from the many institutional options now related in one way or another to 'agricultural extension'. In the countryside one finds integrated rural development projects, functional literacy campaigns, 'animation' teams (in francophone Africa), promotion of technical packages by ministries of agriculture, crop authorities, district decentralisation and planning, village governments, rinderpest campaigns, food-for-work programmes, agricultural service centres, appropriate technology projects, and various other specialised programmes. Most countries promote between ten and twenty major types of rural enterprise (crops, livestock, and natural resources) and receive help from 20-30 various donors. Indeed, the African institutional environment is usually highly differentiated even in quite small countries like, say, Malawi or Senegal. There are thus many organisational alternatives vying for public funds and farmers' attention — probably more than one would encounter within most developed economies. The paradox is that basically poor countries have been helped to establish complex networks of

service institutions which exceed what the local economy can sustain.

The current crisis

Decision theorists have coined the term a 'zero sum game' to refer to situations where what one party wins must be balanced by others' losses. The message of this chapter is that the 1970s saw many African regimes enter a 'zero sum' situation in regard to bureaucratic employment. The euphoric growth in the numbers of training institutions and the overall government establishment which characterised the 1960s came to an end. Deficit financing coupled with a fall-off in export earnings and the energy crisis led to escalating inflation and persistent budgetary deficits. While African countries continue to add institutions and projects, in a 'zero sum' situation this means that existing institutions and projects will be deprived of support and recurrent funds.

Until Africa's current economic crisis, health care, security, primary education and agricultural extension were the four basic functions which citizens had come to expect from the modern state, the 'fruits of independence' (as they were termed in East Africa). When advisers from FAO or other international agencies dealt with agricultural extension, they usually took for granted that the focus would be upon the government's own service, which in many countries offers farmers subsidised technical services meant to promote 'modern farming'. These twin features, public funding and a focus on modern practices, have predominated in African agricultural extension since independence. However, in the interim major changes in the larger environment have forced many countries to re-examine their commitment to publicly funded extension activities.

The most challenging internal shift has been the emergent budgetary crisis which many African public services now face. The post-independence 'boom' period of untrammelled institutional growth is now over: further programme development will require hard choices — between activities, crops, regions, and rival extension approaches. This requirement is reinforced by external pressure from lending agencies like the World Bank, the IMF, and the major bilateral donors for 'structural adjustment': a change in policies towards how revenues are generated and where they are spent. It has become part of the received wisdom that poor countries in economic difficulty should reduce the demands put upon their

public sector. Cost-covering commercial services are seen as more efficient and more appropriate than subsidised public services. It might be noted that this prescription is founded upon deductive arguments rather than upon comparative research, but nonetheless has become part of donors' standard approach to nearly all African countries.

Another aspect of the current crisis has been the poor performance of 'technical packages' which were supposed to generate agricultural growth, and with it a higher standard of living for farm households or, at a minimum, greater food security, under the many loan-financed development projects which African countries have implemented. In many of these projects *these anticipated farm benefits have not materialised.* Repeatedly, farmers have found themselves unable to repay their loan obligations. That this should be so represents a challenge to the entire system of agricultural extension, since clearly a repetition of past development efforts will only accelerate farmers' indebtedness and, in aggregate, national insolvency. While observers disagree in explaining why the shortfall has occurred, a rethinking of the entire commitment to agricultural extension is clearly timely. Consequently, Chapter 2 of this book reviews in detail how African technical packages have been and might be chosen. Loan financing for agricultural development is simply not advisable until the extension system has viable technical packages on offer.

Finally, there are new concepts for analysing 'extension' as part of a service delivery *system.* Earlier approaches to extension treated it normatively, as an activity which *ought* to be done without considering costs or alternatives. External advisers took for granted that whatever types of extension institution had evolved in their own countries were desirable for Africa as well, while national policy-makers thought that farming modernity should be encouraged irrespective of the obstacles. An analytical understanding of agricultural administration can help us to visualise the different technical functions which can become part of a national extension system (see below), just as it can illuminate the major organisational options for providing such assistance. When funds are scarce and new projects can be adopted only at the expense of existing ones, it becomes imperative to develop a basis for systematic comparison between types of agricultural extension. The available institutional options differ greatly in cost-effectiveness and appropriateness within diverse African environments.

Extension functions

Some authors use the term 'extension' to refer to all human and organisational contexts associated with the spread of agricultural technologies; others employ the concept more narrowly to refer mainly to information delivery and training (neglecting the fact that promotion can take other forms and is often most effective when coupled with group interaction). As usually employed, the concept of 'agricultural extension' refers to promoting something: essentially, it means getting farmers to do something which they would otherwise neglect. Implicit in this notion, however, are two invisible elements: i) the partner, prompter or promoter who works with farmers and thereby induces a change in their behaviour, and ii) the innovation being promoted. In its simplest form, extension may depend upon only mass media contact — perhaps a radio broadcast warning farmers of a change in prices or a disease outbreak. But often it also involves establishing an intermediary presence within farmers' communities, either through salaried staff (extension agents, village level workers, etc.) or through co-operatives, committees, and farmers' associations. If we lump all of these types together (they are reviewed separately in Chapter 4), it can be seen that what they share is the *promotion of agricultural technology to meet farmers' needs.*

Table 1.1 lists the various technical functions sometimes included under a broad definition of agricultural extension. By conceptualising technology development as a process, one highlights the interrelationships between potential extension functions. Agricultural extension can then refer to the promotion of any aspect of technology development: how people acquire the necessary resources, how new technologies are evolved, what influences their choice, the kinds of support a given technology requires, how its adoption can be financed and encouraged, and the kinds of protection it entails.

This definition expands upon the American view of agricultural extension, where these days it is often identified mainly with technology transfer.[1] The advantage of an inclusive definition is that it applies to all types of technology and all types of support.

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1. See, for example, the USAID-funded Interpaks project in the University of Illinois, which equates extension with 'technology development and transfer systems'.

Table 1.1 Extension in the Technology Development Process

Aspect of Technology	*Related Extension Functions*
Resource entitlement	Farm organisation, land & water rights
Technology demand	Commercialisation, economic demand & market organisation
Technology development	Agricultural research & planning, adaptive trials
Technology choice	Target domains, needs articulation, on-farm diagnosis
Technology transfer	Information & training
Technology financing	Purchasing organisation, farm credit, insurance
Technology support	Protection, quarantine, disease control, storage, input supplies, transport & servicing

Any technology can become the object of promotional activity, whether supplied by a public firm, a business, or by satisfied users. Furthermore, items of agricultural technology differ greatly in their complexity and in the degree of support they require from the larger institutional system. The delivery of information about technologies is obviously one precondition for the diffusion of innovations, but it is not the only one. Depending upon varying systemic contexts, extension staff may be called upon to supply a range of related technical functions.

From this we can see that even if agricultural extension is conceptualised as being for the support of new farm technologies, *the functions to be emphasised change over time.* This is true in both a 'micro' and a more aggregate sense. Individual farmers starting out — acquiring land, establishing their water supply, or first growing a new crop — have quite different needs from mature and fully commercialised operations. In the same way, as a community's economy evolves its requirements for support and assistance also change. Today's farmers in Europe and America are far more concerned with the economic aspects of extension (price information, economies of scale in storage and processing, and the financing of inputs) than they are with the traditional extension concerns of technology choice and transfer.

Extension demand

The need for extension is inversely related to the degree of direct control which professional staff exercise over production. Promotional activities only come to the fore in those fields of agriculture where technical experts do *not* directly control

production. Fisheries experts, for example, are not themselves fishermen, just as veterinarians are not beef ranchers or goat raisers. There is a general failure to distinguish clearly between the direct use of technologies applied by an operator (farmer, bee-keeper, fisherman) and the general management of technological support (termed here 'extension functions').

The two sets of skills are quite different, though obviously interlinked. A forester in charge of tree harvesting or a ranch manager producing beef are nevertheless primary producers. The 'management' they exert is like that of the farmer working in his or her fields. However, the technologies which primary producers employ have aggregate support needs: input supplies, a system for storage and transport, a purchasing organisation, disease and pest protection, price information, and so forth — what we have called 'extension functions', since those managing such activities deal mainly with other people even when the purpose is to facilitate the transfer and use of new technologies. The expert in such settings becomes effective by influencing other people; his or her impact upon primary output is indirect and requires social, political, and communicative skills. Unfortunately, the professionals being prepared for work in natural resource fields such as agronomy, forestry, range development and fisheries are mainly trained in primary production skills, but they take up positions requiring extension skills.

The aspect of scale also determines support requirements. In a large farm, many technical functions are supplied by the operator directly and do not require public assistance. In most of Africa, however, production will entail grouping hundreds of smallholders into a common perimeter, and then helping organise the supply of a whole range of additional technical functions, which are difficult to provide unless there is substantial local demand for them. Smallholder farming poses particular problems, affecting commercial as well as public extension activities. Its characteristics often include:

- a scattered clientele living in remote areas
- variegated crops grown in diverse ecological settings
- the crop-specific nature of much agricultural advice
- pronounced resource constraints of individual farmers
- the highly seasonal and risky character of much agriculture
- low reliability of many official services
- multi-task and multi-functional scope of assistance

- high levels of diagnostic skill required.

Where people rely on hand cultivation, their farms tend to be very small: on average, two hectares or less over much of the more densely settled parts of Africa. Any service agency (whether public or private) must therefore deal with hundreds of smallholders scattered over the landscape. The small size of individual holdings and transport economics make it unlikely that individual farmers will constitute an attractive prospect for commercial suppliers. Moreover, the highly risky nature of production means that, even when farmers follow instructions, they may lose their entire crop and be unable to repay farm loans.

It is also clear that our 'extension functions' need not be confined to crop production as such. Horticulture, bee-keeping, fisheries, livestock production, social forestry, irrigation, nutrition, and even small industries all share a need for organised promotion and support. This commonality is *not*, however, reflected in how most ministries define 'agricultural extension'. Within Africa, the extension services are more likely to deal with crops than livestock, and within crop science with the major export and food grain crops (maize, rice, wheat and sorghum) rather than with supposedly 'minor' crops like cassava, bananas, plantains and yams. Thus while the extension services are usually three or four decades old, they in fact address only a restricted domain within the much larger universe of technologies required for agricultural development. A basic question facing many African regimes is whether to extend the coverage of agricultural extension into new areas such as livestock extension, irrigation and social forestry (see Chapter 3).

We can safely conclude therefore that the content of extension activities is very much *phase-governed*, depending upon the evolution of the larger farming system and the corresponding degree of elaboration in support services (Byerlee 1988). Extension needs consequently vary greatly between crops, communities, and regions, and they change over time.

The necessity of choice

The principal message in the chapters to follow is that Africa's extension planners *must* begin making hard choices. This necessity would exist even if the continent were not experiencing acute economic and political crises. For example, as long as agricultural extension was viewed in simplistic terms as a 'good thing' to be provided everywhere without attention to contexts, many expensive

mistakes occurred. Training institutes have been established in remote districts which lacked commercial crops and where farmers knew more than the ministry about producing what they were already growing. School leavers have been enrolled in specialised training to receive skills they are unable to put into effect until many years later, when they acquire land of their own. Extension staff have been posted to work in communities for which few relevant technical recommendations existed — a situation noted some years ago for Rungwe District of southern Tanzania by a Dutch team, who recommended that the extension service be shut down until it had something to extend (Luning and Venema 1969). The first step in designing extension interventions should always be to assess the degree of evolution in local farming systems, so that the skills, information and services which will have the greatest impact can be pinpointed for priority attention.

However, the 'alternatives' in our title concern more fundamental choices, between entire institutional options as listed in Table 1.1. If other as yet unserviced enterprises such as livestock production or fisheries need similar forms of assistance, 'extension' soon grows to encompass a vast range of activities. The conventional approach adopted by most government departments has been to lobby for adding specialised units to carry out each kind of extension which the evolving agricultural economy might require.

Generally this means hiring professional staff, adding various cadres of low level employees (drivers, clerks, etc.), and then establishing field offices in places where a given type of production will be encouraged. The resulting organisations replicate the general features found in a typical ministry of agriculture (which often serves as their parent bureaucracy). They are strongly hierarchical; they employ salaried professionals; they recruit various technical experts (provided initially by external donors); and they employ a large number of administrators and support staff. The ballooning of service units seems constrained only by financial limitation.

We began this chapter by stating that this kind of professionalisation of all rural services is simply not economically sustainable in a poor economy where farmers cannot yet support user charges. Africa's peasant agricultural production is especially demanding of external assistance, while paradoxically providing only a weak revenue base to support the activities required. Ultimately, extension planners must begin to balance the desirability of aggregating smallholders' service needs against the

high transaction costs which a bureaucratised service delivery system will entail. At what point in a given area or with regard to given crops does the assistance merit the employment of salaried expertise? This is the key unresolved question which will surface again and again throughout these chapters.

Continued support for agricultural extension will require that greater attention be directed towards six policy issues:

Which functions and tasks should receive organised assistance?

How should existing systems be changed to increase their impact?

Should different and less expensive approaches be adopted?

What measures might increase cost recovery?

What linkages between organisations are necessary?

How can farmer participation be encouraged?

Essentially, these issues comprise the agenda around which the discussion in this book will be organised (though presented in a different order). The aim is to provide a stronger analytical foundation for choosing reform measures and for deciding when and where to offer particular types of agricultural extension. This review should prove useful to most Third World ministries of agriculture, but is addressed particularly to the poorer African countries where the low institutional performance of extension services has become an overriding national concern.

2
What To Extend

Approaches to agricultural extension can be categorised into two broad types: those based on 'push', where the system itself targets innovations which it tries to promote among farmers, and those based on 'pull', where the service organisation responds to the demands of those seeking help.[1]

There are numerous structural reasons why demand-led extension of the second type (exemplified by the commercial delivery of producer services) is rarely seen in Africa. Instead, we have a 'bureaucracy-led' extension which, often in advance of farming system demand, promotes technical innovations which scientists believe will meet farmers' needs. For the most part, this approach has not been successful beyond encouraging fairly simple changes like planting in rows or keeping introduced types of poultry. And yet 'getting it right' is absolutely crucial in bureaucracy-led extension. Unless recommended technical packages perform locally as expected, farmers will not experience genuine benefits to offset the costs incurred. Why, for the most part, have the technical packages recommended in formal extension performed so poorly? In this chapter we explore this question in relation to five topics.

(i) Simple solutions for complex problems?

The outstanding success which plant breeders experienced when developing high yielding varieties for Asian agriculture encouraged a hope that similar breakthroughs might be achieved in Africa. International CGIAR centres such as ICRISAT and IITA have carried out two decades of work looking for promising Asian cultivars which might achieve an African 'green revolution'. What they

1. A distinction originating in a DPMC (1976) project manual, cited in Garcia-Zamor (1985), p.4.

discovered, instead, was that African conditions are by and large more demanding than those in the Asian success stories. For example, when ICRISAT screened some 7,000 sorghum cultivars for promotion in Burkina Faso, only two proved generally superior to existing varieties; of some 3,000 millet entries so screened, none were superior when grown under on-farm conditions (Matlon 1985). Compared with the Asian situation, African crop varieties must perform well despite:

- higher levels of pest challenge
- very strong competition from weeds
- the possibility of back-crossing with wild varieties
- higher degrees of moisture and temperature stress
- nutrient-depleted and eroded soils
- basically unreliable input delivery.

Obviously, regional and local variations affect the degree of stress which introduced varieties face. The highland areas of Africa, particularly where nutrient-rich volcanic soils are found, do allow HYVs, particularly of maize, to show their potential. However, over large parts of the rest of Africa subject to drought and with very ancient, impoverished soils, the above constraints jointly constitute a challenging environment. Farmers encounter a synergistic interaction between negative pressures sufficiently strong for many varieties which seem promising in South Asia nevertheless not to outperform the best African varieties when grown under typical African conditions. There is also, in Africa, much less prospect that irrigation can be used to boost the yield of input-dependent 'green revolution' varieties (Moris and Thom 1990).

In Africa, simplistic technical and organisational solutions rarely pay off. These days the gloom over Africa's slide into economic and administrative chaos is so deep that analysts have been sent out to search for successes; see the writings of Leach and Mearns (1988) on the woodfuel crisis, of Harrison (1987) on agricultural modernisation, and of Pradervaud (1989) on local group organisation. This 'literature of hope' is worth reading, and gives a much needed boost to African morale: some projects, particularly local ones that do not rely on the larger system, are succeeding. Unfortunately, however, the nature of agricultural projects means that often both producers and their service agency staff must rely on the larger national system. This subjects them to adverse trends of a systemic nature (see Chapter 5). Almost always African 'successes' come to international attention after three or four years,

when projects have the glowing assurance of early maturity but are not yet expected to show demonstrated results. Long-term, demonstrated successes are few, and tend to come from certain favoured countries like Kenya, Zimbabwe or Senegal.

(ii) Cases in unsuccessful technology transfer

Let us then examine briefly a few well documented cases of attempted technology transfer within Africa — not the easiest targets, like the absurd Nordic frozen fish factory in Kenya's Turkana or the northern Nigeria irrigation schemes, but on the contrary, those which seemed to technical experts with considerable African experience, novel and useful solutions especially suited to African needs.

(a) Swamp rice in West Africa

The rolling topography of Sierra Leone and other coastal areas of West Africa, with clay-filled valley bottoms containing thousands of small swamps, offers a unique opportunity for swamp rice cultivation. Sierra Leone farmers already grow both 'wet' and 'dry' rice varieties. Technicians decided that with perimeter bunds, levelled fields and a central drainage canal, coupled with newer high yielding Asian wet rice varieties double cropped, farmers could achieve greatly increased yields. Such 'improved' swamp systems built with loans from the World Bank can be contrasted with farmers' own practices generally combining roughly two-thirds upland (rainfed) rice with one-third indigenous swamp cultivation (Richards 1986:25). The two indigenous versions, upland valley farming and coastal mangrove clearing, have been matched by modern adaptations which entail increased physical construction and more labour-intensive rice varieties. Richards (1985, 1986) points out that the rationale for extending loan financing to the 'improved' versions rested on two false assumptions: i) that land was a more limiting factor than labour, and ii) that the intensive, valley bottom production of wet rice was more efficient and profitable.

There are excellent analyses of this attempted intervention (Richards 1985, 1986). Johnny, Karima and Richards (1981) point out that among Sierra Leone's farmers the advantages of swamp cultivation are known, but weighed against an accurate perception of the associated costs. On the positive side, swamp rice is obviously less subject to rainfall uncertainty, and farmers are less tightly

bound by timing decisions (an advantage to traders or teachers who are short of labour). On the negative side, swamp cultivation requires a high initial labour input; the rice varieties are less palatable and harder to sell; sickness is greater; and the work itself is harder and occurs in undesirable conditions. More seriously, swamp farming obligates households to specialised monocropping of rice.

Now that the World Bank's improved systems have been in operation for some time, their problems have become clearer (Moris and Thom 1990:174-5):

- Differences in mean yields were less than projected because traditional production was underestimated
- There has been a high failure rate of supposedly more secure 'improved' swamps
- Swamps with insufficient water flow have major soil management problems, including iron toxicity
- On some swamps, attempts at levelling led to a loss of all water retention
- Swamp rice was traditionally a woman's crop; few of the men given loans had cultivated swamps before (Dey 1984)
- Swamp cultivation exposes farmers to heavy weed infestation, the main reasons for abandonment of traditional swamp cultivation (Owen 1973).

(b) Water harvesting for African drylands

The equivalent to swamp rice schemes found in Africa's drylands has been water harvesting, a technology introduced from Israel where expensive physical works are constructed to trap surface water. After a severe drought in 1979-80 affecting Kenya's Turkana people, those receiving food aid were required to build massive earth diversion bunds designed to concentrate run-off sufficiently to permit crop production. The participants in these 'food-for-work' schemes were usually women, stranded without herds by the deaths of their husbands or by the drought. However, the large earthworks they constructed had no relation to their own farming, based on goats and camels and a little sorghum. Intense tropical rainstorms, found even in very dry areas like Turkana, created flows of water sufficient to breach the unconsolidated new structures, leading to their catastrophic failure, while, if effective, the earth bunds denied water to important forage trees and other users downslope. Today,

few of the bunds remain intact despite the huge effort made to construct them (Hogg 1988).

We can contrast this situation with the smaller but more effective rock terrace lines found in Yatenga in northern Burkina Faso (Harrison, 1987). Such retaining structures, built and kept in repair by the owners of the land where they are situated, are loosely built, and allow excess flow in heavy storms to proceed downslope.

(c) Developing Maasai range production

The Maasai people of southern Kenya and northern Tanzania have received many externally designed interventions over the years, notably Kenya's Group Ranches (Galaty et al. 1981, Evangelou 1984), the Ngorongoro Conservatory Authority (Arhem 1985), and the USAID assisted Maasai Range Project (Moris 1981, Moris and Hatfield 1982).

As a participating 'expert', I can describe the little known Maasai Range Project (1970-79) from firsthand experience. The project was meant as USAID's response to the Tanzanian Government's desire to modernise the traditional, semi-nomadic production of Maasai pastoralists. As late as the early 1970s, the Maasai still appeared to follow their ancient way of life, based on 'transhumance': a movement between wet and dry season pastures, with livestock, consisting of cattle, donkeys, sheep, and goats, owned by households (under the senior male's control), but grass and water approximating 'open range' conditions.

USAID's willingness to support a major multi-disciplinary team project was based on the assumption that cattlemen's associations (like those found in Nevada) coupled with planned control of grazing on public lands (like those managed by the Bureau of Land Management in the US West) could serve as a model for transforming Maasai pastoralism. Experienced USAID range scientists helped design the Maasai Project, with Ranching Associations (covering about 200 ha each), and Management Plans (a five-block rotational grazing system to be implemented on each Association's lands). The objective was to stimulate commercial beef offtake to pay for range improvements, coupled with the provision of modern veterinary services, water development, and livestock marketing. Sociologists were included as insurance, to help identify and eliminate anticipated social obstacles.

The points of divergence between these official objectives and the actualities of the highly successful indigenous system can be

summarised as follows:

- Under a highly uncertain bimodal rainfall regime, rotational grazing showed no demonstrable improvement over existing practice
- Ranching Associations, while initially popular, corresponded to no indigenous decision-making unit with enforcement power, nor to the Tanzanian Government's system for territorial administration
- The project's technical goals were all framed on the assumption that the Maasai were beef producers eager to sell cattle commercially, while they were mainly milk producers who kept smallstock (unmentioned in project documents) for food and sale
- The project straddled the Livestock and Water Development Departments, which came under different ministries not accustomed to dealing with each other
- The 'improved' breeding bulls introduced during a time of drought required extra water and forage, were unable to trek alongside Maasai cows, and showed no interest in cows (having been raised on Veterinary Stations without access to cows). In any case, many soon died from endemic East Coast fever.

(d) Improved maize for smallholders

As East and Southern Africa's primary food staple, maize has received a good deal of attention from analysts and sporadic support from scientists (see Anthony 1988 and 1979, Blackie 1984, FAO 1986a,b,c, Francis and Rawlins-Branan 1987, Franzel 1984, Gathee 1982, Gerhart 1975 and Kydd 1989). It is usually not realised by younger Africans, for whom maize is now their 'traditional' food, that this is a recent development; fifty years ago the staple crops were varieties of millet and sorghum. The present preference for maize actually increases farmers' risks, since maize is less drought-tolerant than the crops it has replaced (Moris 1989b).

However, farmers' preferred varieties of white maize, originally derived in colonial times from the American South, are no longer those used in developed countries where maize is fed to livestock. The African 'flint' varieties are very hard, and are traditionally left by farmers on the cob to dry in the field. If stored in containers, flint kernels are much more resistant to weevils than the soft 'dent' varieties preferred by US farmers (field interviews from Malawi and Tanzania). Kydd (1989) provides another classic case, one which should be required reading (alongside Haugerud 1988) for all

neophyte plant breeders in Africa. Basically, the mistake made in Malawi was to decide that progress would be easier if maize breeders switched to the 'dent' varieties, which are easier to grind mechanically, and were considered (perhaps wrongly) to be more nutritious.

In other respects, Malawi's plant breeders (who had come from Kenya's highly successful programme with flint composites and synthetics) made sensible choices, trying to develop a composite variety (which can be replanted by farmers and improved by their own efforts) rather than the pure hybrids found among Zimbabwe's commercial farmers (which must be planted with fertiliser — a problem for Malawi's poor subsistence producers, many of them women — and cannot for technical reasons be re-used as seed for the next crop). However, Malawi's smallholders refused to make the transition to the yellow 'dent' varieties developed by the researchers. Instead, by 1984 (when I visited Malawi), the Ministry had reverted to promoting Zimbabwean hybrid maize varieties. When social scientists from a local FSR team protested, explaining the strong reasons behind farmers' preferences, they were eliminated from the FSR programme (see Spring 1988b).

(iii) Why good research produces bad packages

The foregoing cases demonstrate how well-intended scientists using the best conventional methods can nevertheless produce highly inappropriate technical recommendations. Most natural scientists simply do not believe that this occurs very often, and would regard these cases as untypical aberrations. On the contrary, there are numerous structural reasons why conventional methods, when employed in Africa, *typically* give bad extension recommendations.

(a) How science handles variability

African rural environments can be astonishingly variegated and complex, though perhaps more so in East and Southern Africa than in the vast plains of West Africa. Africa's complex soils are often encountered in catenary sequences, so that a given area displays an array of soil types (Ahn 1977). Similarly, where soils are impoverished many nutrients are carried within living systems, a complex assemblage of species quite different from the monospecies stands seen in temperate zones. In scientific research, the investigator typically seeks to remove tangential variability and interactions from the research design so that they do not confound

the interpretation of experimental results. However, in highly variable production systems the scientist's simplifying assumptions have the unrecognised effect of making experimental outcomes *unsuited for the direct derivation of extension recommendations.* Furthermore, research stations are usually not heavily cropped in the way that farmers' fields are; even the 'controls' may represent what are in fact 'elite' conditions. The many complications which arise in tropical environments when trying to generalise from small experimental plots were recognised two decades ago. Belshaw and Hall (1972) explain why field practitioners have become so wary about employing station-derived research recommendations as a basis for extension advice. Multilocation field trials of the type advocated by Denning (1985) are not only desirable; they become mandatory.

(b) Generalising from sites to domains

Where local site conditions are so variable, accidents of season and of topography can have a large influence on results; they make it extremely difficult to determine which seasons and places are *representative.* In the drier lands of Africa, for instance, many places seldom receive an 'average' rainfall (which is a statistical artefact) or experience an average season. Livestock researchers perhaps face the most severe technical problems in this regard, because their large animals are so expensive and slow to reproduce, and because on-station conditions differ so markedly from those of producers (Moris 1988b). Studies indicate that more work is needed to find valid and operationally feasible ways of relating local, point-derived data to spatial domains (Bunting 1987).

(c) Deciding which constraints to relax

Most researchers on peasant farming systems eventually come to recognise that *under existing constraints* it is difficult to improve markedly upon smallholder production (Greyseels et al. 1986, Zandstra et al. 1979). This observation directly contradicts the notion often expressed by external scientists, that there is a large backlog of promising innovations if only peasant farmers would adopt them (Merrill Sands 1986).

Under 'yield gap' analysis pioneered at IRRI, the difference between experimental station yields and actual farm yields can be interpreted as comprising two constituent 'gaps', the first measuring non-transferable and environmental differences and the second

biological and social constraints (Denning 1985). Where (as in Africa) the combined 'gap' is large, deciding which constraints can be relaxed becomes an act of faith.

External scientists have tended to favour high input farming because in their home environments such systems are ecologically and economically sustainable. Here common sense plays an important but unrecognised role. At home, they know from earlier experience which production possibilities are feasible. In foreign environments, however, they no longer enjoy access to this intuitive sense. It is ironic that these same scientists (cf. Simmonds' disdain for non-economists within FSR) dismiss institutional and social analysis as an unnecessary luxury, while choosing which constraints to relax on the basis of mere hunches.

(d) Short- vs long-run output

Another judgemental matter is the choice of timeframe for evaluating agronomic success. Experimental science frequently confines analysis to the outcomes of individual trials, without examining the long-run implications when the same land will be re-used time and again. For example, the main reason why the 'green revolution' HYVs must have an accompanying injection of chemical fertilisers is their heavy nutrient demands. African peasant farmers, on the other hand, expect to replant the same fields season after season, sometimes (for poorer farmers) with the same food staple. Here a low yielding but hardy 'traditional' cereal interplanted with a legume (as Kikuyu farmers do) may be the desirable option in a longer-term evaluative perspective. The same issue arises in connection with certain very nutrient-demanding export crops like tobacco. For poor African farmers, long-run sustainability is a better guide than short-run yield optimisation.

(e) Analysing farm decision-making

Conventional farm economics adopts a budgeting approach to analysing farm decision-making (Perrin et al. 1976, Upton 1987), i.e. an individual farm operator is seen as allocating various inputs (land, labour, seed, etc.) over the whole of the farm at the start of each season, with in-season variations catered for by application rates, represented as totals budgeted for each month. While there are additional refinements (Upton 1987), the approach essentially seeks to determine the balance between summed inputs (costs) and summed returns (output minus costs).

This budgetary approach is taken for granted in virtually all the agronomic experiments used to derive extension recommendations. It depends upon an underlying input-output model, which portrays decision-making in a time-sliced, tidy fashion quite different from the way farmers behave in real life. Actual African farmers respond to an unfolding scenario of changing opportunities and constraints (e.g. wet vs dry years, early vs late onset of the rains, pest outbreaks in a particular crop, unplanned labour shortages, and so forth). They have varying degrees of control over the farming done by different members of the household (Moock 1986), and they frequently go off the farm to expand their options in an unfavourable season, perhaps working for other farmers, or cropping the commons to expand a threatened food reserve. They bring to their farming an accustomed 'script' (Vierich 1987), modified as the season unfolds in a manner Richards (1989) likens to a musical performance, or which Stewart (1986) describes as 'response farming'. This sequential pattern of 'yes/no' and 'maybe' decision-making within a highly uncertain environment is entirely missed in conventional analysis. We might term it a 'process' model in contrast to the 'gate measurement' fixation of input-output analysis, which, while useful *after the fact* to judge the efficiencies attained, is a poor guide to actual decision-making *within* the season.

(f) Seasonality and its implications

In contrast to Asian irrigated farming, African farming is especially subject to strong seasonality (Sahn 1989, Chambers et al. 1981). This helps to explain why even in settings characterised by widespread underemployment, farmers put a high priority upon their labour at peak periods (Moris 1989b, Moris and Thom 1990). Several researchers have found that supposedly 'low-yielding' traditional practices favoured by farmers give a higher return per day of labour input than do 'high-yielding' improved practices (here see Alverson 1984 on Botswana and Gathee 1982 on Kenya). Station-based scientists have been slow to realise that the returns to labour at peak periods may be an even more important evaluative criterion than yield per hectare. (On some stations, no record is kept of daily labour inputs within particular trials.) When, as in Gathee's example, we get diametrically opposite weightings from these rival criteria across a range of production options, it is time to take seasonality seriously.

(g) Valuing subsistence production

Most African subsistence farmers plant certain varieties for the specific reason that they mature early or in other ways circumvent the 'hunger period' when labour demands are highest and purchased food most expensive (Moris 1989b). It therefore becomes very important to value home consumed production in a way which corresponds to farmers' own preferences. Unfortunately, as Behnke (1985) shows using livestock examples, the conventional assumptions followed in project appraisal yield nonconforming valuations and hence bad results when used for predictive purposes. Subsistence production tends to show the simultaneous presence of several valuations which are not consolidated around a single farm-gate price. Effective estimation must therefore draw more upon behavioural knowledge within a system, and employ less deductive imputation of costs and benefits from a distance. Behnke's article should be required reading, supplemented by Ellis (1988) on household economics.

(h) The neglect of risk

McPherson (1986) asks why researchers continue to ignore risk when evaluating peasant production. Economists familiar with current practice may find his complaint unjustified; these days one of the last steps in an appraisal is to subject the results to sensitivity analysis as a precaution against issuing non-robust recommendations (Upton 1987). However, there *is* a real problem here.

Economists recognise a distinction between 'risk' and 'uncertainty' (the former being subject to estimation). African producers experience great *uncertainty*, much of it man-made. In some countries, peasants have experienced at short notice the total invalidation of the national currency (a measure intended to penalise currency smugglers, but which also tremendously affects remote rural producers who keep savings as hard cash), huge price shifts (on the order of 400% over a season), scavenging soldiers, locust outbreaks, unexplained plant and animal viruses — these are all common. Mace (1989) finds that the proximate risks experienced by smallstock producers in northern Kenya were sufficient in the late 1980s to completely mask *any* differences in household managerial ability. The high riskiness of production *and* of reliance on the market virtually forces poorer producers to adopt

subsistence-oriented production strategies (Swanberg and Hogan 1981, Lang and Cantrell 1982, Glaeser 1984). Furthermore, even commercial farmers (who must pay their workers) are at a marked disadvantage when risk levels are high.

(i) Single vs multiple species

It has often been noted that peasant farmers in the tropics prefer to grow many crops and varieties of the same crop (Ruthenberg 1968 and 1980, Bernard 1972, Lagemann 1977). Diversifying production is one obvious hedge against uncertainty, since disasters tend to be enterprise-specific. There are many varieties of African root crops, each with its specific uses; one survey among the Shambaa of Tanzania found they keep ten varieties of bananas alone. Haugerud (1988) points out that Rwandan farmers prefer to have several cultivars in one field:

> A potato field that contains five different cultivars with different maturity and harvest dates, and different phenotypic traits such as tuber colour and shape, would be a nightmare for a Western, commercial mechanized farmer. In Africa's tropical highlands, however, maintenance of such diversity is an important means of managing risk, environmental hazards, and resource limitations; and a means of meeting varied production goals (e.g. home consumption, sale in different types of markets).

Bernard counts sixteen food crops typically grown by the Meru of Kenya, and several non-food ones as well (1972:52). In nearby Embu, I found field enumerators soon lost patience and simply stopped recording these 'minor' or 'women's' crops. Lagemann (1977:41) shows, however, that the mixture of 13 crops common to Nigeria's forest zone is deliberately planned to ensure that several yield food in each month. Even worse, from the researcher's standpoint, *most* of Africa's forest zone crops are interplanted (and some grown amongst standing trees).

Yet again, this diverges greatly from what one sees on researcher-managed field trials. To give agronomists their due, in much of Africa trials now concentrate upon intercropping of 2 or 3 species rather than the pure stands formerly seen (Gathee 1982, Keswani and Ndunguru 1982). Few, however, also look at small ruminants simultaneously or document the complex movements of crop by-products and residues between enterprises. In the dry zone of Africa, once researchers measured all inputs (using an energy flow model and measurements of total biomass), they discovered

that existing 'traditional' systems are more productive than modern mono-enterprise alternatives like ranching under similar constraints (Coughenour et al. 1985, Behnke 1985).

(j) Embedded models and privileged solutions

In a larger perspective, these difficulties arise because analysts and practitioners bring to their tasks preferred modes of analysis as well as preferred solutions to problems. For example, there is a deeply embedded notion that scientific development of technology proceeds in an orderly and linear sequence, from *basic* (or 'components') research, which is then taken into variable field sites as *applied* research, and lastly fine-tuned in collaboration with clients through *adaptive* research. This idealised model is brought to the situation rather than growing out of examination of how technologies evolve in the real world.

Similarly, there are in African rural development what I term 'privileged solutions' (Moris 1987). Examples have already been given of professionals bringing in technologies developed elsewhere which they were certain would be more effective than local alternatives. 'Privileged' status exempts such 'solutions' from critical review and the necessary adaptation which would make them successful (Quick 1977). In the field of extension, the World Bank's T & V system is simply the latest example.

Unfortunately, the causes of bias are cumulative; their aggregate effect greatly exceeds the distortions caused by each considered individually. All in all, I would guess that research station findings apply well to large farms and ranches exhibiting 'elite' conditions (as might be predicted), and are partly transferable to the cash crop portion of commercially oriented producers' farms. But by and large they are misleading and even plain wrong for the guidance of poor or subsistence-oriented producers. And, of course, if an extension service's recommendations do not confer perceived benefits this undermines its own local influence (Moris 1987).

(iv) Successful technology choice

To identify promising interventions correctly is perhaps the single most important step in the technology development process. Korten (1980) points out that most successful projects go through an initial learning phase before stumbling on a particular package of measures which yields the desired results and can be replicated more widely. And yet this initial discovery phase is largely taken

for granted in formal project appraisal. About how to discover and refine the initial innovation little is said.

Recent African experience suggests that neither 'system-describing' nor basic 'components research' will generate the technical solutions which many poorer farmers need. We have already noted the cluster of reasons why basic research results have produced so few improvements suited to farmers' actual production situation. Because of the problems with the 'transfer of technology' paradigm, in the early and mid-1970s many research scientists turned eagerly to systems analysis as a means of finding more effective interventions (Greyseels et al. 1986). But research on African farming systems, pioneered by Ruthenberg (1968), was not initially much more successful (see the discussion of FSR in Chapter 8). The high variability in key factors, the many potentially significant variables, the masking effects of zonation, seasonality and impoverished soils, the large degrees of institutional uncertainty, and the many species and associated technical options must all be dealt with simultaneously. Unless given clear structure and direction, systems-describing research (which *is* research, albeit not experimental research) can dissipate scientific resources over a huge array of complex and interesting factors. It, too, lacks a methodology for identifying priorities and thus soon degenerates into the segmented 'multi-disciplinary' research which has been so expensive and inconclusive in Africa to date (Savory 1989).

ILCA's experience with technology choice is illustrative. Among the CGIAR centres working in Africa, it was ILCA which first oriented its research towards systems-describing objectives. Africa was divided into major livestock production zones, and a field multi-disciplinary team was introduced into each to describe what was there as a preliminary stage before addressing particular interventions (Jahnke 1982, Greyseels et al. 1986). There was one exception: in Kenya, ILCA concentrated on the performance of an institutional innovation, the Maasai group ranges, and after five years of team research, decided that it did not bring the expected benefits (Evangelou 1984). In the other zones — the Ethiopian rangelands, the semi-arid Sahel, the sub-humid zone, and the West African humid zone — there were no commitments initially to particular interventions and by 1986 none had emerged for the Sahel programme centred in Mali and Niger (Wilson 1986).

In Nigeria, however, ILCA's two field teams started at what would be the middle stage if they had followed the usual linear

sequence. While beginning to describe their respective zones, the research staff also undertook rapid, on-site screening of possible interventions which farmers found attractive (von Kaufmann 1983, Sumberg and Okali 1988). Without a formal methodology, they nonetheless explored the issues that would be used in Hildebrand's 'sondeo method' (1981), or Crouch's 'problem census' (1984): rapid rural appraisal (RRA) rather than verification oriented research.

What emerged in the North was the concept of 'fodder banks', a fenced area near the home compound where forage was reserved to support a few key animals during the long dry season (von Kaufmann 1983). This innovation appealed to itinerant Fulani herders who had stopped moving seasonally and needed both better forage and a means of staking out a secure land claim. In the South, ILCA took over a minor innovation already studied by IlTA, the use of rows of within-field fast growing trees which could be browsed by goats even as crops were grown between them (technically called 'alley farming' and described by Sumberg 1984). IITA had simply focused on the yield impact upon associated crops, failing to see that for farmers growing both crops and goats there was an emerging shortage of small ruminant fodder. (My own impression was that farmers welcomed the browse species within their fields because they could be used as yam stakes.) In any event, once these locally popular interventions had been identified, ILCA and IITA researchers were able to isolate the key technical factors and begin creating an associated base of empirically tested information. ILCA's Nigeria teams were thus simultaneously pursuing research 'backwards' to look at individual components and 'forwards' to anticipate possible application problems as the new technologies spread.

The advantage conferred by starting in the middle is the possibility of using information feedback from farmers to prioritise expensive experimental research. This RRA procedure gives greater weighting to farmers' own experience and technical observations. These two ILCA cases constitute excellent examples of the 'opportunity analysis' which Keller and others at Utah State University have advocated.

Nonetheless, it is essential that the 'backward' and forward' aspects be kept in tandem. ILCA's one Ethiopian intervention, the single ox plough, shows the dangers of promoting an innovation without adequate field testing (Greyseels et al. 1984). Under local conditions, it turned out that poorly nourished Ethiopian oxen were

unable to pull the plough designed by researchers and that farmers were unable to keep a straight furrow. We have heard much less from ILCA about its single ox plough in recent years.[2]

(v) Extension implications

This is not the place for an attempt to overturn the vast bulk of scientific theorising about African agricultural development. The reader should be warned that many scientists do not share the prognosis developed here. However, these same scientists do admit that their record of attainment using orthodox components has been dismal. Perhaps therefore it is time to look at different approaches.

First, most solutions we might suggest are fairly complex and require careful adjustment to suit local conditions. Bureaucracies, on the other hand, excel in delivering simple interventions and are bad at adapting recommendations to suit varying local conditions (as already seen in this chapter). If African governments do decide to continue with publicly supported extension, it should be by means of a professional type of service delivery which puts highly trained staff into direct touch with farmers. The 'machine bureaucracy' model favoured by civil service agencies is *not* what Africa needs.[3]

Second, the scientists themselves should come from a different, more ecologically oriented tradition. They must avoid the simplifying assumptions normally taught within orthodox 'components research', and cannot afford to give priority to disciplinary concerns. Savory (1989) is undoubtedly correct to insist that Africa needs holistic methods for research analysis. It is the critical linkages which connect *between* components — soils, climate, livestock, pests, and plants — which are at the core of new approaches, and which would get downgraded and overlooked if conventional, discipline-grounded perspectives are applied.

Third, the most promising approaches concern different ways of combining multiple species with multiple practices over the course of each season (e.g. *response farming* and *permaculture*). Effective answers are likely to consist of an assemblage of species and practices. Analysts must discover how such interlinked enterprises

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2. These comments derive from several visits to ILCA's major programmes in 1986 and 1988.

3. A term coined by Mintzberg to contrast strongly hierarchical organisations with four other types (Miller and Mintzberg 1983).

jointly safeguard the soil, maintain effective moisture, feed animals, provide household energy, support constituent plant species, and sustain the farm's long-run nutrient status. Longitudinal study must then find how within sustainable limits the components can be added one by one as the system matures. Sometimes scientists may suggest new and more effective combinations, but often the ideas will come from farmers themselves or from interested observers, perhaps working with NGOs or other non-CGIAR institutions. The role of scientists then becomes one of providing an understanding of why an evidently successful system works and of delimiting the boundary conditions pertaining to its various interactions.

Such research is exciting and intellectually demanding, but it starts from different premises from those which have governed much technical research up to now. We saw how adoption of a farming systems perspective led agronomists to analyse intercropping, and thus in turn to discover why Africa's traditional practices were superior to those which scientists were themselves recommending. In much the same way we can expect scientific work to follow from the identification of successful enterprise assemblages, rather than in the first instance suggesting what these combinations will be.

Fourth, the extension system should cultivate bottom-up linkages. Extension field staff must learn how to identify and evaluate farmers' own indigenous technical knowledge. They must encourage farmer-to-farmer information exchanges. They can help scan the larger economic environment to spot any successful technologies which seem to circumvent local production constraints (Ellman 1987). They can alert scientists to such opportunities, and thus help stimulate relevant technical research to backstop interventions identified in the field. This implies having horizontal communication linkages over various networks throughout an area, and encouraging two-way communication between producers and relevant scientific experts. An 'open' system of scientific support oriented towards farm-level opportunities should thus replace the 'top-down' conveyor belt model which has hitherto dominated most analysis of research-extension linkages.

Fifth, our cases of unsuccessful technology transfer highlight the great importance of looking at the procedures for selecting the technical content of extension messages. This means cultivating better linkages to the research services without abdicating to

research scientists the choice of technologies. Linkage problems will emerge again and again throughout this study as a crucial area requiring further organisational innovation (see Denning 1985, Jahnke et al. 1987, Lipton 1989, Lipton and Longhurst 1985 and Richards 1985).

Finally, the various structural reasons why officially promulgated 'technical packages' have been so deficient are also good reason for avoiding loan-financed rural development. Giving loans which do not actually benefit farmers creates many subsequent problems for field extension agents. Indeed, in environments where risks are as high as those described by Mace (1989), field agencies should not

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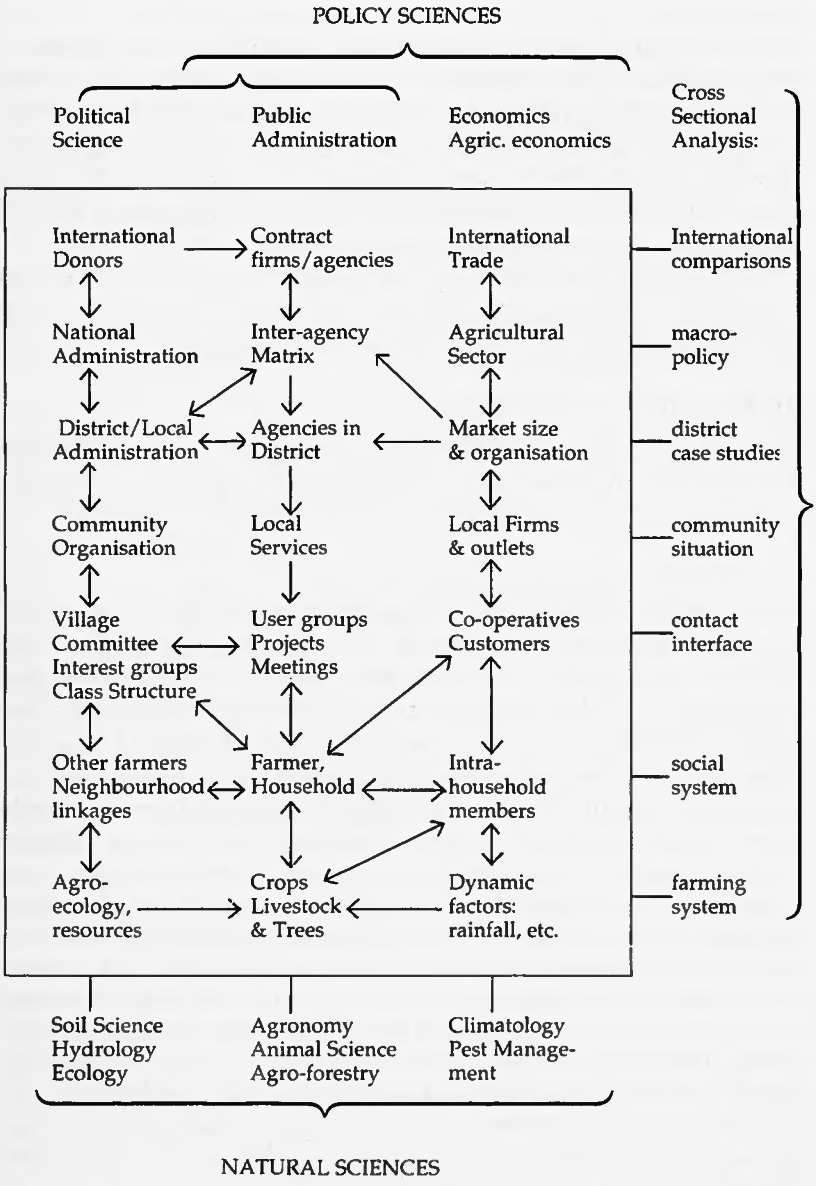
Extension Contexts

A problem which must be faced when analysing the effectiveness of extension services is the complex organisational, economic and ecological setting which impinges upon tropical smallholders (see Figure 3.1). No one profession or academic discipline encompasses all the major components. Those who see 'extension' as technology transfer will focus on communicating information about new varieties and husbandry innovations to farmers; those who deal with community problems will look at local leadership and how individual farmers participate in their communities; while those who analyse environmental trends will adopt a geographical and zonal approach.

The most obvious organisational context will be farmers and their workers (household members and others) who are in direct contact with crops, livestock and trees, and who react to dynamic ecological factors. External organisations may study these same factors, but they do so from a distance and are generally poorly informed about the specific natural constraints which farmers encounter. The failure of natural scientists to recognise this fact explains the poor design of technical packages reviewed in Chapter 2, and is now being overcome by much closer attention to farming systems research and to farmers' participation in guiding technical agricultural research itself. Many field agronomists have come to accept that universalistic models of technology transfer employing powerful simplifying assumptions should be avoided within complex and locally variegated peasant farming systems.

Exactly the same could be said in principle about the institutional contexts which African smallholders experience. There are significant differences in the territorial administration and mode of approach to communities between African countries, just as various agencies have their own modes for local action and farmers participate differently in crop handling activities (involving

Figure 3.1 The Organisational Contexts of Agricultural Extension



commercial firms, co-operatives, or crop authorities). These variations in how farmers are linked into the larger network of support institutions have usually been glossed over in the extension literature.

To improve service delivery we need to learn how to conceptualise these differences, and then undertake actual comparative research and analysis to discover which options perform best in which contexts (see Chapter 4). What Figure 3.1 portrays is basically a 'loosely coupled system' composed of a whole matrix of political, administrative and economic institutions already operating within African rural environments.

In a small book like this, one cannot do justice to the full complexity of the service delivery network. This chapter will therefore highlight three types of extension context.

(i) Regional variations

One of the major difficulties in proposing how extension programmes in Africa can be improved is the great variability between countries and different systems within each country.

(a) Northern Africa

In this review we shall ignore countries north of the Sahara, except insofar as they influence others to the south (e.g. Egypt). Foremost in the zone is Sudan, but much like it are Somalia, Djibouti, and Mauritania, as well as the northern two-thirds of the ex-French Sahel countries (Mali, Niger, and Chad) and parts of lowland Ethiopia. These are all places where the land ranges from semi-arid to true desert. Agriculture in the sense of crop farming depends largely upon irrigation, though there are highland pockets (e.g. Darfur) where rainfed cultivation occurs. The livestock sector was traditionally very important, but comprised goat and camel keeping transhumant herders whose activities were not integrated into the crop sector. Irrigation field units are occupied either by tenants within large-scale schemes or else by small-scale horticulturalists who depend on privately owned pumps along the rivers or at oases. Sharp differences in scale, permanence, and crops grown between these various types of farmers have inhibited the development of a common extension system. Usually the large-scale irrigation areas have developed their own approaches, e.g. the Sudan Gezira Board (a parastatal corporation). National extension systems tend to be

relatively recent — a nucleus of professional staff added to a larger Ministry of Agriculture which had diverse functions.

The Islamic and Arab heritages of inheritance laws, work calendar and the primarily domestic orientation of women, have greatly influenced social patterns at the local level. Until recently, few candidates received westernised education. Thus while these countries do have a few highly trained extension specialists at the national level, we do not find a large pyramid of post-secondary middle-rung staff. The total 'extension service' will usually not exceed a few hundred staff (compared to several thousand in the East African zone).

Throughout this zone Arabic is the main language for technical communication. Thus the de facto centre for scientific learning and manpower training is Egypt, with Pakistan playing a subsidiary role. Command of Arabic provides trained manpower with access to the whole Middle Eastern labour market, resulting in the significant problem of a 'brain drain' of experienced senior staff. On the other hand, they gain training for their own nationals and an expatriate work force fluent in Arabic.

(b) Francophone Africa

There is quite a different situation in the francophone countries. For instance, the Ministry of Agriculture often does not have major implementation responsibilities. Instead, it serves in a technical and advisory capacity, planning the project portfolio for publicly financed activities in the agricultural sector, which, once they have become part of the national plan and subsequently the annual budget, are usually implemented by an array of parastatal institutions dealing with individual export crops (groundnuts, cotton, cereals, and sugarcane). Until quite recently, however, it was common to find expatriate technicians holding the key managerial and supervisory posts in these agencies.

A somewhat different approach has been tried in some countries, where the entire nation is divided into separate development regions, each with its own parastatal agency responsible for implementing projects in its territory, and receiving funding direct from the central government. Obviously, extension will take a different form in such systems from the centrally-planned, monolithic approach found in the typical Ministry of Agriculture. The MOA itself may be grouped with other technical functions into a larger Ministry of Rural Development (as, for example, in Niger).

After Sudan, the francophone countries have the largest irrigation systems in sub-Saharan Africa. Typically there will be a separate agency which handles most aspects of irrigation, such as SAED's role in promoting small-scale irrigation in Senegal, ONAHA in Niger, the Office du Niger in Mali, and SEMRY in Cameroon. Some of these agencies have vigorous programmes for village-level training and involvement.

The Francophone zone has seen much experimentation in how villagers should be taught and mobilised for rural development, sometimes on a community basis, and at other times by loosely organised associations (termed 'pré-coopératives' or 'groupements').[1] Perhaps the best known of these programmes is Senegal's *animation rural*, in which ingredients of a typical extension programme were combined with village selection of leaders and representative farmers (*animateurs*), credit, and co-operative organisation. Even literacy programmes have been linked to the teaching of accountancy and technical skills, as, for example, in Belloncle's work with Niger's co-operatives on ONAHA's irrigation schemes (Belloncle 1985). These approaches, then, combine elements of literacy training, community development, local leadership, and extension in quite different ways from those seen elsewhere (Stevens 1981).

(c) East Africa

In East Africa, 'extension work' is usually seen as the Ministry of Agriculture's *main function*, though also combined with specialised technical and regulatory functions. The extension service in Kenya, Uganda, Tanzania, Malawi, and Zambia will be among the largest in the continent. Tanzania and Kenya each have over 10,000 paid extension employees working in the field (if one counts field staff attached to special crop authorities). As a consequence, postings tend to be parallel to that within the main administration (here Malawi is an exception). If the country has districts, each will have its District Agricultural Officer (or DAO) with a nucleus of lower-level staff below. A large hierarchy is, of course, strongly influenced by the general financial situation. Throughout East Africa there are many complaints about the training, motivation,

1. The term 'pré-coopérative' has been adopted in contradistinction to the earlier 'co-operatives', which became highly unpopular by the end of the colonial period.

and performance of contact staff, who in turn complain about shortages of transport, housing, and allowances to enable them to function effectively.

East African extension services must cope with great environmental variability related to the Rift Valley system and its associated highlands and closed drainages. Whereas in West Africa the ecological zones are usually several hundred kilometres wide, in East Africa they are governed by altitude and orographic aspect and may vary within a few kilometres. The content of technical packages must be adjusted for each community, and even for individual farmers whose farms may have particular soil conditions. As in the Sahel, East Africa has a 'problem climate' with uncertain rainfall and a high element of risk. Yet there are small areas on the higher mountains or near the Rift Valley lakes with high and reliable rainfall (1,000 mm or more annually).

The early spread of westernised schooling throughout the zone made possible an emphasis on post-secondary education as the minimum qualification for middle-rung extension staff. In most countries there will be several Certificate and Diploma Agricultural Colleges (with 2 years post-secondary training for a Certificate and 3 for a Diploma), sometimes still under Ministry control, but others well established, independent institutions with their own Board and even international recognition (e.g. Bunda College in Malawi and Egerton University in Kenya). Faculties of Agriculture exist in each country, and the language of instruction and use is English. The heaviest concentration of scientific resources is in Kenya, which has UNEP and the regional headquarters of various aid organisations (the World Bank, USAID, ILRAD, CIMMYT, and the Rockefeller and Ford Foundations). The potential transferability of extension packages between countries within the zone is high. While all of them once had a significant large-scale farming sector (though less prominent in Uganda and Malawi), Ministries of Agriculture have long since made the transition to concentrating on smallholders' needs.

(d) Southern Africa

The Southern African region overlaps with East Africa; in some respects Malawi and Zambia are more like the other countries to the South. Large-scale farms using modern technology provide a greater share of agricultural output in this region than in the countries further north. This is reflected by a sharp duality in

extension services offered by the Ministry of Agriculture. The large-farming sector usually enjoys good input delivery (seeds, fertilisers, equipment) combined with sophisticated land planning and credit. On-farm water supplies have often been established, accompanied by limited irrigation. The livestock industry is highly organised, and receives major attention from the Department of Veterinary Services. Extension advice is therefore highly individualised and professional, with the private sector quite active (agricultural chemicals, etc.). When breakdowns occur, the farmer will get on the phone and may receive replacement parts the same day (e.g. in Zimbabwe's irrigation schemes).

At the other extreme, the former 'communal' or 'tribal' lands had indigenous livestock, poor yields, and much less scientific attention. Ministry staff in these areas were often based in a chief's or headman's camp, with only a bicycle for covering a large, thinly populated territory. Extension packages for food crops were lacking. A long-standing tradition of labour migration has meant that in many communities people regard agriculture as less rewarding than working in the mines. There is a pronounced ecological, social, and infrastructural difference between the more 'Europeanised' highveld areas — the plateau zone with better soils and cooler climate — and the more typically 'African' lowveld with higher temperature and less amenities.

This background explains why, although Southern Africa has highly developed scientific and educational facilities, concentrated at Harare in Zimbabwe, levels of education, farming and wealth at the local level may nevertheless be disappointing. The initial attempts at raising indigenous farm productivity were often channelled into settlement schemes. With their planned rotations, supervised credit, and dense staffing, these represented a 'mini' version of organisational forms in the large-farming sector. While some projects of this nature continue — mainly to safeguard irrigation investments — their high cost limits further expansion.

Instead, the Southern African countries are struggling to upgrade staff resources within the traditional small-scale sector while absorbing the high standard research and advisory services into a common national system. Where the private sector is still vigorous (as in Zimbabwe, Botswana or Swaziland) there are some losses of senior ministry staff into private employment. For countries in this zone, a collapse of the large-scale sector would be disastrous economically; nevertheless, a rationalisation and integration of

functions must be achieved so that smallholders share more of the fruits of national development.

(ii) Task domains

For the most part, African Ministries of Agriculture have developed their extension services to promote officially recognised crops: cotton, coffee, tea, rubber, tobacco, maize and sorghum. Other crops and enterprises of significant importance to African households, such as yams, bananas, plantains, sweet potatoes, arrowroot, amaryths, goats, donkeys and honeybees, may receive little or no attention. While the rhetoric used when justifying extension talks about general goals — helping to safeguard food supplies, protecting crops, and raising incomes — in practice formal agricultural extension has been directed towards support of a much narrower range of farm activities. Basically, 'extension' in most of Africa means *crop extension* related to a few major export and staple crops (e.g. maize, beans and coffee in upland Kenya).

After four decades of effort, no doubt Ministries of Agriculture have become reasonably proficient in assisting their self-chosen priority crops. Nevertheless, in a situation of stringent budgetary constraints, the question arises of how other crops and emphases of equal economic importance to farmers should be dealt with. There are at least six additional domains which require 'extension' support in one form or another, as detailed below.

(a) Nutrition extension

Most Ministries of Agriculture have tucked away at some place in their bureaucracy a section which deals with human nutrition, often linked to women's clubs and home gardening. These topics represent a continuation of what used to be called 'home economics' (in the USA) or 'domestic science' (in the UK). They are rarely given much priority by the parent ministry, but continue in operation because they can tap funds from NGOs, donors and international organisations like UNICEF.

In fact, gardens around and in the home compound are very important nutritionally in African agriculture. (The homesite may be for 'landless' households their only 'farm', from which the whole family must be fed.) They are usually under a woman's control, and will contain diverse crops such as passion fruit, guava (a rich source of Vitamin C), oil palms, yams, sweet potatoes, amaranths, beans, a few stalks of maize, sorghum or millet, bananas, plantains, and

various 'European' vegetables like carrots and cabbages. Homesite agriculture is by definition highly intensive, and employs a wide range of 'minor' crops, to support both the family and their livestock. As a source of nutrients, it can be very important even though little attention is given it within official extension packages.

There are, however, excellent general sources which deal with the nutritional aspects of agricultural development (see Pacey and Payne 1985). IITA in Nigeria has for some years had a small programme looking at home compound agriculture in the West African farming zone, and there is an equally important linkage to agro-forestry, a central feature of ICRAF's research in East Africa. What are missing are the important cross-connections to fish farming (for Africa's humid zone) and to small ruminant production (for drier areas). Given the negative impacts on human nutrition which follow from an overemphasis on export crops or even maize (because of its greater susceptibility to drought), the nutritional aspects need to become a central focus within all agricultural extension programming. To do so will necessarily mean giving more attention to women's needs within the farming system.

(b) Livestock

Livestock extension has also been left an orphan within Africa's formal programmes.[2] In many countries, livestock development is the official responsibility either of the Veterinary Department (as it was in colonial days), or of a livestock services section dominated by veterinarians. Usually veterinarians hold clear-cut ideas about how governments should promote livestock development: institute effective disease control (a huge task in tropical Africa), introduce high yielding 'exotic' breeds or upgrade 'improved' local breeds (here livestock experts disagree, some promoting exotic cross-breeds while others try to tap the superior disease resistance of local breeds), promote modern ranching and commercial production, remove tsetse flies, and assist dairy farmers with better pastures and perhaps even artificial insemination (Jahnke 1982). Having virtually

2. Sources dealing with various aspects of African livestock development include Adams (1982), Almond (1987), Anteneh (1985), Behnke (1985), Coughenour (1985), de Haan and Nissen (1985), de Ridder et al. (1982), FAO (1984), Galaty et al. (1981), Goldschmidt (1981), Hill (1985), Jahnke (1982), Leonard (1986), Moris (1986a, 1988b), Sandford (1983), Scoones (1988), Simpson and Evangelou (1984) and Swift (1989).

no contribution from users (Leonard 1986, Anteneh 1985), veterinary departments have tended to rely upon regulatory measures and sporadic inoculation campaigns, their long-run goal being to promote the transfer of ranching and dairying technologies from large farms to widespread use among smallholders. Existing practices have been viewed as far inferior to high yielding introduced technologies (Behnke 1985). Not surprisingly, 'extension' based on these concepts has enjoyed little acceptance among average producers (Goldschmidt 1981, Simpson and Evangelou 1984).

Recent studies have demonstrated that many of the beliefs shared among Africa's animal scientists are technically erroneous when applied to smallholders. In terms of biomass supported per hectare, existing traditional practices give a higher output than modern ranching under similar constraints (Behnke 1985, Coughenour et al. 1985, Hill 1985, Penning de Vries 1983, de Ridder et al. 1982). Rotational grazing, long the linchpin of official programmes for herd improvement, probably does not yield higher returns than existing practices under tropical African conditions (Sandford 1983, Savory 1989). The measures being promoted are often capital-intensive, and increase producers' risks in an already very risky environment (Moris 1988b). The evaluations used in project appraisal have seriously underestimated the value to producers of non-monetised 'subsistence' uses of livestock — a crucial weakness which has caused outsiders persistently to misunderstand the production systems they were trying to modernise (Behnke 1985).

Livestock extension thus inherits the baggage of erroneous assumptions and several decades of coercive regulation. It has also suffered because the technologies being promoted are particularly vulnerable to economic and political dislocations. Improved animals represent a huge financial commitment to a smallholder. When there are multi-year droughts, an absence of commercially available feedstuffs, roaming gangs of bandits, and non-availability of imported drugs, it is hardly surprising that farmers avoid such investments. The persistence of technical packages based on assumed 'elite' conditions under a deteriorating ecological, security, and economic regime is a testament to the wilful blindness of scientists and policy-makers alike. A further, bureaucratic problem is that livestock services in many countries come under a separate and rival ministry from crop extension, making intercommunication even less likely.

Of course, as on so many topics reviewed here, the southern Africa situation represents an exception: here disease control is good, and the access to large urban markets in South Africa (or Europe, for districts free of the dreaded foot and mouth disease) makes commercial ranching a viable proposition. Elsewhere, however, countries are being forced to consider privatising their veterinary services (Leonard 1986 and 1987b, de Haan and Nissen 1985) or even handing over responsibility to NGOs which can work directly with distressed producers (Almond 1987). There is tremendous need for better technical packages which deal with agro-pastoralism, and which can assist ex-nomads once they begin to settle. Underexploited indigenous species (e.g. acacias, camels, and goats) should take precedence over conventional species. Furthermore, some form of local organisation of producers is necessary, so that pastoral peoples can protect their land and water rights and share information about markets and risks (Galaty et al. 1981). This is not how the international research centres like ILCA and ILRAD see their task, however. For the immediate future one can predict that livestock extension will remain unappreciated and ineffective. That this should be so is especially ironic, since African food producers mostly depend upon animal traction for growing the cereals which everyone admits are in short supply.

(c) Irrigation

Irrigation is another area where promoters of the technology have tended to work independently from the extension service. In many African countries, irrigated agriculture has been made the responsibility of separate parastatal organisations, such as Sudan's Gezira Board, Niger's ONAHA, Senegal's SAED, and Kenya's National Irrigation Board (Moris and Thom 1990). These organisations have chosen to involve farmers as tenants on formal irrigation schemes. While the scheme approach is both expensive and relatively ineffective, African policy-makers tend to see irrigation as an automatic answer to the problems of drought and high-risk rainfed cultivation. This 'privileged' status has allowed Africa's formal schemes to persist without much criticism, even though the cost-effectiveness of 'developing' an area under formal schemes is very low (Moris 1987).

Meanwhile, by far the largest share of Africa's irrigated production comes from areas farmed under spontaneously evolving systems for small-scale irrigation (the major exception being Sudan,

where formal schemes predominate). Seasonally flooded wetlands are a prominent feature in many parts of rural Africa (Turner 1986). As population densities continue to rise, farmers are learning to make increasing use of these wetlands. In order to be cropped, vertisols require a mixture of drainage and irrigation techniques carefully adapted to local site characteristics (Jones and Egli 1984). The techniques employed may appear quite simple, but nonetheless effective use of seasonally flooded land requires sophisticated indigenous technical knowledge which has only recently begun to be appreciated by outside observers (Richards 1985, 1986).

(d) Soil and water conservation

In Africa, official attempts at promoting soil and water conservation date back to the colonial era, when misguided terracing campaigns contributed to grass-roots mobilisation against the colonial governments (Young and Fosbrooke 1960:141-67). In the British colonies, the 1945 Commonwealth Development and Welfare Act provided funds for a major attempt to create scientifically based land planning and soil conservation, but to little effect. The measures imposed on peasant farmers were either technically unsound or generated such fierce resistance that they had to be abandoned, while measures aimed at immigrant large farmers became widely accepted.[3] Particularly in Zimbabwe (Cousins 1988), but also in Zambia, northern Tanzania, and highland Kenya, practices were developed which suited large-scale, mixed farming. Even today, these areas show some of the most advanced dryland farming techniques found within 'black' Africa.

This leaves the issue of soil and water conservation for small-scale or 'peasant' farmers in limbo. Compulsory measures such as narrow-based terracing or stock reductions acquired such unpopularity that most African governments have avoided them in the post-Independence period. Meanwhile rising populations and a continuing inflow of migrants from the overcrowded highlands exacerbate land degradation. Outsiders have continued to impose ill-suited technologies upon Africa's drylands, with 'water harvesting' (see Chapter 2) being yet another good idea misapplied into incompatible systemic contexts (Hogg 1988, Reij et al. 1988).

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3. For cases from various parts of Africa, see Anderson and Grove (1987), and Richards (1985).

As Blaikie notes about national soil and pasture conservation policies (1985:43): 'with a few significant exceptions, their results fall far short of their intentions'. Once again proponents of change must learn how to fit interventions into local systems, and should be prepared to find that practices suited to highly mechanised, temperate farming may nonetheless be ineffective in the tropics. Furthermore, persuading people to adopt what are after all quite labour-intensive practices depends crucially on the immediate returns individuals receive — which explains why many so-called conservation practices are evidenced only where local people receive 'food for work' as a reward for constructing them.

(e) Social forestry

Social forestry is relatively new on the African scene, having come to the fore as a result of increasing international concern about deforestation and desertification. Officially managed 'closed forests' are clearly insufficient to supply projected energy needs. Rapid urbanisation has stimulated commercial charcoal production, derived from overstressed marginal lands in places like northern Kenya, central Somalia, or central Sudan. Nobody has yet found an alternative to fuelwood (or charcoal, its derivative) as the source of household energy for Africa's poor. The growing imbalance between production and extraction rates within existing woodlands has become a focus for explicit policy attention.

First-generation efforts aimed at increasing wood production took the form of village nurseries and the promotion of more fuel-efficient cooking stoves. As Gamser (1988) argues relative to Sudan, trying to encourage energy conservation from above by Ministry directives and donor funding did not succeed. There was the perennial 'turf' problem between rival ministries: choice of species and nursery supervision under the Forest Department, environmental monitoring under the Energy Department, technology development under Small Industries, farm development under the Ministry of Agriculture, seedling destruction by goats under Livestock, and research under either a National Council of Research or the universities. Then, too, the foresters' preference for eucalyptus species conflicted with villagers' own preferences; and the initial design of cooking stoves was often faulty. Neither the many seedling nurseries established after the 1970s drought nor the promotion of 'improved' stoves by NGOs have enjoyed the success expected.

Painfully and as yet only partially, forestry experts have been forced to recognise that they cannot simply outlaw goats throughout Africa, and cannot dictate to people which species of trees they should protect. Often the immediate users of African woodlands are women, whose individual situations will dictate which trees are cut and which saved — yet these are the very people who in the past were hardly ever consulted within officially formulated tree nursery projects (Fortmann 1985, Fortmann and Rocheleau 1985). If Africa's woodlands are to survive, this will only be because people themselves value the resource and experience proximate incentives which favour keeping trees alive (Anderson 1987, Leach and Mearns 1988, Fortmann and Bruce 1988).

Foresters must learn to act as catalysts: finding ways to encourage the protection and sustainable use of local species around homesteads and in the 'commons'; stimulating village-level projects maintained by the people themselves; and even working with artisans to devise more fuel-efficient household technologies (Gamser 1988). Thus for most of dryland Africa the *only* forestry which matters is social forestry, and this in turn must assume a collaborative mode of intervention which is strongly at variance with the typical 'top-down' model foresters once employed (Foley and Barnard 1984, Shepherd 1986, Leach and Mearns 1988). It is a lesson which agricultural extensionists could also learn.

(f) School agriculture

Many African countries teach agricultural topics within general education, either as a part of environmental science in the lower levels or as a separate and examinable subject in secondary education. However, despite the large number of students who receive such instruction, it is usually not cross-related to the content of extension education because of the division of responsibilities between government ministries. School agriculture typically falls under the Ministry of Education, while extension education comes under the Ministry of Agriculture.

A strong case can be made for a closer integration between these two types of agricultural training. First, formal instructional materials are expensive to prepare and must be related to local environments. There is every reason to share such materials between different branches of the public service, and, in fact, school programmes often look to the extension service for technical materials needed by the teachers of school agriculture. Second, to

offer effective agricultural education in a school context requires on-going extension support. Schools often have their own production enterprises, such as poultry units or vegetable gardens, which need inputs and expert advice (e.g. if there are disease outbreaks). Field tours for students — always a popular item within school agriculture — must be arranged in conjunction with staff in the areas or institutions visited. Third, if students are taking several years of formal instruction in agriculture they have a right to expect that they will not be required to repeat this instruction if they should be recruited into the Ministry's own programmes for pre-professional training. Formal liaison between school agriculture and extension training is therefore both desirable and necessary (Moris 1976).

(iii) Target groups

With the 'new directions' adopted by USAID, ODA and the World Bank in the early 1970s came increased recognition that to be fully effective service delivery systems must target particular groups of clients. A generalised extension approach conveying uniform recommendations for all may not suit any particular group of clients — a strong possibility in bimodal systems where 'average' farmers are in fact a statistical artefact. Furthermore, there is now firm evidence that, when left to their own devices, extension workers tend to seek out a minority of better-off farmers (Roling 1988). To reach all types of farmers, the service delivery system must learn how to identify and target specific types within the rural system.

(a) Smallholders

It has only been during the last two decades that policy-makers have finally begun to recognise the obvious differences between African smallholders (or what might be termed 'peasant farmers') and commercial producers. Typical traits associated with Africa's smallholdings include:[4]

- very small farm sizes, under 1-2 ha for a combined holding

4. There are sources which discuss this pattern in detail, notably Ruthenberg (1968, 1980), but also some classic case analyses of individual farming systems such as Richards (1948) on the Bemba, De Schlippe (1956) on the Zande, Scudder (1962) on the Tonga, Bernard (1972) on the Meru, Lagemann (1977) on the Ibo, Norman et al. (1982) on the Hausa, Glaeser (1984) on the Usambara, and Richards (1986) on Sierra Leone.

- land fragmentation in densely settled areas
- reliance upon hand cultivation rather than machinery
- minimal use of purchased inputs other than labour
- multiple crops and enterprises as a hedge against risk
- multicropping, staggered planting and relay cropping
- location of crops to match variations in soils
- grouping of enterprises in concentric belts
- livestock enterprises only loosely linked to crops
- a trend towards 'labour involution'.

While some major differences exist within and between these cases, the general pattern they display is strongly at variance with the unified, mixed farming model assumed in agricultural economic analysis. Almost always the riskiness of production is a major worry, and in most cases farmers also devote a large effort to circumventing the strong seasonality they encounter (Swanberg and Hogan 1981, Moris 1989a). Individuals within the 'farm' also typically act independently with regard to their own plots, depending upon their gender, age and social relationship to the compound head (Moock 1986). In particular, to survive smallholders must avoid the cash outlays associated with high-input farming, and must juggle labour availability to compensate for the marked seasonal bottlenecks in labour demand (see the discussion in Chapter 2). Supposedly attractive technical packages which ignore these preferences are often rejected by smallholders even when they appear to give much higher returns in a research station environment.[5] Indeed, many of Africa's research scientists still employ analytical assumptions which fail to recognise smallholders' known constraints.

(b) The poor

Since most smallholders in Africa are poor, when technical packages fail to deal with smallholder constraints they also adversely affect the poor. In each African country there are distinctive terms for the genuine poor, usually applied to those without permanent rights in land, who as a consequence are both seasonal farmers and strangers in the local community. Being poor means having no buffer to tide a household over the annual 'hunger period', and relying on the overstressed commons for wild foods or firewood

5. For examples see Alverson (1984), Belshaw and Hall (1972), Gathee (1982), Glaeser (1984), Kydd (1989), and Richards (1986).

which can be converted into charcoal. Africa's rural poor usually do farm, 'begging' land to grow annual crops, even planting small gardens along the roadsides on public land. Chambers (1983:103-39) argues that we should conceptualise 'integrated rural poverty' to reflect the overlapping impacts of powerlessness, vulnerability, physical weakness, poverty, and isolation.

All five forces impinge upon the poorer households of Africa, where (as we have seen) the environmental and economic constraints are powerful and interactive. Life in the lowland hot tropics is much more demanding physically and of the accompanying support system than external analysts admit. Of the earlier writers, perhaps only Owen (1973) and Kamarck (1976) fully recognise this fact. For Africa's poor, subject to pronounced dry seasons and high levels of uncertainty, as well as to recurrent droughts and perhaps civil war, simply to survive each dry season requires a major effort and an array of coping strategies (Corbett 1988, Watts 1987). The degree of hardship experienced is in part a reflection of their inability to mobilise local support under adverse circumstances. Three categories of people are especially disadvantaged in this regard: nomads, refugees, and women farming alone (discussed in our next section).

Semi-nomadic pastoralists are found right across Africa, usually occupying drier lands where crop farming is too risky to support large agricultural populations (Galaty 1981, Jahnke 1982, Moris 1986b). Almost always they are a minority, having a different language (and sometimes religion) from the numerically dominant agricultural peoples represented in the national government. Thus in times of adversity, they suffer disproportionately. In the extended droughts of the early 1980s, traditional pastoralism in much of Sudan and the Horn of Africa simply collapsed (Moris 1988a). Today many of these ex-pastoralists have still been unable to regain the animals required for using their dry homelands, and remain on famine relief or as squatters outside major cities.

Similar obstacles face the numerous refugees, some created by the extreme drought conditions but many more by ongoing civil wars in places like Somalia, Ethiopia, Chad, Eritrea, Sudan, and Mozambique. Refugees constitute even a majority of the local population in certain border areas (Anderson and Woodrow, 1989). As it happens, the militarisation of the countryside has often taken place in the same lands which are most drought-prone, so that adverse impacts are interactive and cumulative. 'Extension' in such

settings comes after people have been located within camps; it is often organised by NGOs and famine relief organisations and must adapt to the quasi-military style of camp governments.

There is now a huge literature on drought and hunger in Africa.[6] Many countries have large areas which experienced up to three or four dry years in succession during the 1980s, a repeat of the mid-1970s drought. In places like Eritrea and Botswana, there were as many as *six* dry years in succession. Such catastrophes, combined with civil war, have destroyed the life savings of many rural households. And yet, while coping with drought has become an almost universal obsession, most people have received no help at all from formal 'extension' services. The truth is that field extension staff are not in touch with the poorest segments of the local community; they lack suggestions about how to cope with drought; and they are tied to formalistic and unrelated programme emphases dictated from their national headquarters. On crucial issues such as what household survival strategies to recommend, or how to evaluate 'early warning' of drought, Africa's official extension agencies remain silent.

(e) Women

Among technical scientists, the impression is often created that they regard as fundamentally illegitimate the addition of gender as a factor to guide research recommendations. In public they affirm the goal that women farmers need assistance; privately, they consider this a 'political' and ridiculous demand. There are few women farmers (in their view); scientific principles clearly operate the same, irrespective of gender.

Are such views correct? As far back as the 1960s in Eastern Kenya, it was difficult to locate men to interview on the farms which were ostensibly under male control. As one walked about the countryside towards midday, it was women one mainly encountered: in the fields, carrying water, selling beans, harvesting maize. And the men? They were away: sometimes for months at a time, looking for work; away drinking in the bars which clustered around the marketplace; away perhaps doing daily paid labour to raise the cash required in their own farming. The truth is that *on the farm itself* and for the larger part of each day, women are the ones doing farm

6. See Adams (1988), Corbett (1988), De Garine and Harrison (1988) Glantz (1987), Moris (1988a) and Watts (1987).

tasks. Formal surveys in Africa's rural communities find that from 15% to about 30% of all farms are in fact entirely operated by women; if we added those where men are away most of the time it might rise to over 50%.

Clearly, there are cultural and regional variations. In the Islamic areas, men do the fieldwork and women aspire to stay at the homestead (although even then, not universally). In parts of the forest zone in West Africa, men also spend their time in the fields while women do the trading and craftwork. There are parts of East Africa where the men are expert farmers and give priority to their holdings rather than outside pursuits. Nonetheless, these examples are *not* the majority. My guess would be that perhaps half of Africa's smallholdings are operated mainly by women; and the nearer one gets to the mining areas, the lower the participation of men. One reason is that throughout much of sub-Saharan Africa women have the main cultural responsibility for growing food to support their families. Another is that long-distance labour migration has been a male activity — a pronounced pattern in West, East, and Southern Africa. A third is perhaps the instability of many marital unions under adverse economic circumstances, so that women are often left stranded by the fathers of their children.

For whatever reasons, then, women constitute the largest single category of active 'farmers' from the standpoint of actual crop husbandry. There are a growing number of quite carefully documented studies of these farmers, who differ in significant ways from their male counterparts.[7] Usually, they are in charge both of food gardens and of the household. They are extremely short of time, since they must split their attention between field and household tasks (such as carrying water and tending children). They do many of the tasks formerly assigned to men, but in return men still resist doing the jobs seen as 'women's work'. They rarely obtain credit. Most cannot make major on-farm investments without first receiving male approval (Dey 1981, Staudt 1978). Most have less security than men in regard to land rights, being accorded land by virtue of their status as 'daughter','wife' or 'widow'. Many are

7. Dey (1981, 1984, 1985), Due (1988), Due et al. (1987), Ellis (1988), Fortmann and Rocheleau (1985), Jiggins (1986), Jones (1986), Moock (1986), Poats et al. (1988), Richards (1948), Spring (1988a,b), Staudt (1978), Sumberg and Okali (1988), and Wily (1981).

poor; the greater share of Africa's entirely destitute people are women and dependent children. And they receive almost no recognition within the male-dominated systems of village governance.

Do such traits merit special treatment within extension services? I would argue, very definitely, they do. People who have different land rights, different access to labour, different degrees of social support, and who grow different crops for different production reasons are hardly an insignificant category — especially in places where they constitute the actual majority of those operating farm holdings. They are also the ones with accurate knowledge about many traditional crops and their associated processing technologies.

I recall the following incident, which took place during one of our Kenyan surveys:

> We had completed the formal questionnaire when the respondent, an old woman, asked if now could she please tell us some facts. She was, she claimed, the person most knowledgeable about growing yams in that community. She proudly showed us some enormous yams, the size of a child, and explained at length how they should be grown and the particular traits of each variety. These plants, she insisted, were very important for poor women like herself who had only a little land. Now she was old, and would soon die: could we please convey these observations to the Agriculture Department so that other women might be helped?
>
> But agricultural officials had no place in their programme for yams. It was not, they explained, a priority crop. There was nobody to receive the old woman's tape recorded empirical observations, garnered over a lifetime spent growing yams. The extension system was entirely oriented towards receiving messages from its research scientists: there was at that time no means for conveying new observations upwards into the formal system.

Thus natural scientists who gloss over the need for separate attention to Africa's female farmers are getting it wrong in three major respects. First, the majority of those growing food crops are women, not men. Second, the significant share of all households headed by women are very disadvantaged within the existing formal system and clearly differ from male-headed farms in the crops they emphasise and in the production strategies they adopt. And, third, the older women are the main repository for valuable indigenous technical knowledge on topics which are only poorly understood by external scientists.

We can admit these facts, which are becoming less controversial as evidence accumulates. Even so, how does an extension service go about re-orienting its field activities to meet the special needs of female farmers? I have elsewhere itemised ten changes which could be adopted (Moris 1981:85):[8]

- recognise women as heads of household in procedural and legal matters, so that they are more free to make farm investments
- encourage family planning to give women more control over the size of the households they must support
- make a special effort to recruit female extension workers
- design programme content with an eye for low-resource farmers who need adequate family nutrition but lack land
- give extra attention to improving household energy and the efficiency of time-consuming processing and water conveyance tasks
- devote more research to those enterprises which are crucial to women: goats, sweet potatoes, yams, bananas, and various other horticultural crops
- devise an extension package for 'landless' farmers who have only the space around their houses for farming
- include single-parent families as a demographic category for planning rural services
- stop importing capital-intensive equipment to replace the traditional crafts upon which many poor women depend (e.g. basket weaving)
- schedule school vacations and the payment of school fees to the times when labour is short or cash available in the farming system.

(v) Implications

This is the longest chapter in this book. This was not intended, but as things turned out many of the shortcomings in Africa's current programmes concern either major gaps or a poor fit between present activities and what the context demands. Let us briefly summarise the implications from each of our three major sections.

In regard to national system configurations, clearly countries differ greatly in how support systems are organised. Sometimes

8. For further discussion of interventions to assist women, see Chapter 6 in Moris and Thom (1990), Mutiso (1979), Poats et al. (1988), Spring (1988a,b), and Weidemann (1987).

most services are offered by various types of parastatals; in other cases, large multi-functional Ministries of Agriculture or Rural Development encompass the whole field. There are major differences in the languages used, and in the degree to which 'off-the-shelf' technologies exist suited to smallholder extension. How agricultural research, training, and marketing is organised also differs within and between countries.[9]

Such features must be taken as 'givens', whose prior establishment then defines the 'policy space' governing where interventions should be directed. If a country has a large network of farmer training centres (as Kenya has) or an excellent mid-level Natural Resources College (as Malawi has), the specific measures to be considered should capitalise upon these existing strengths. When resources are scarce, standard solutions imported from abroad which pay no attention to local competences and resources cannot be afforded. Furthermore, there are only a few major centres of professional excellence capable of serving field institutions. More co-operation between countries is an obvious way of avoiding expensive duplication of effort.

In regard to the major subject 'domains', a common pattern has now become evident across the whole spectrum of missing topics. Again and again initial attempts to 'develop' a given field, as in forestry or irrigation, began from technologies and procedures which assumed favourable production environments and a high degree of control over producers. But in Africa one must expect adverse environments and a low degree of control. Almost always, effective solutions require working *with* producers and consumers while developing the technology — the main point Gamser (1988) makes in regard to 'improved' stoves in Sudan, but one which applies to the whole gamut of interventions reviewed here. Livestock scientists, for example, have not even discovered that they are recommending 'elite' packages which assume favourable production environments (Moris 1988b). Indeed, in countries facing severe disruptions conventional 'extension' services cease to be relevant. For them, a linkage between NGOs and local producer groups like the para-vet programme in southern Sudan may be the only viable short-run solution (Almond 1987).

9. In recent years, ISNAR has carried out a series of studies which describe these structures in various African countries.

In field after field, the adoption of 'bottom-up' or 'farmer-first-and-last' extension is an essential change in how *scientists* approach reality (Chambers and Ghildyal 1985, Lightfoot et al. 1988, and Rhoades and Booth 1982). Nobody expects them to relearn their modes of approach easily, but that is precisely what they must do if they desire greater acceptance for their 'technical packages' (Ashby et al. 1987, Belshaw and Hall 1972, Biggs 1984, Chambers et al. 1989, Farrington and Martin 1988).

Furthermore, it is also clear that orthodox 'extension' simply omits the larger problem areas which confront farmers. High input farming of the kind the CGIAR institutions have tried to promote is totally unsuited to high risk farming in an impoverished economy where people will be replanting the same fields year after year and where imported inputs are not available. The topics of livestock development, irrigation, social forestry, and better nutrition are of great potential importance to African producers. Where official extension programmes gloss over these areas, major changes in how programmes operate would seem mandatory. Extension planners may bemoan the increased complexity of the institutional system (Oram 1986), since the network of relevant institutions cannot be controlled from above by Ministry directives. Nevertheless, the transition to a network situation with multiple contributing agencies is in my view necessary and inevitable (see Chapter 6), and we should search for modes of collaborative action which bring the missing domains into 'mainstream' extension.

Finally, extension services must develop targeting systems which circumvent the present 'gatekeepers' who block communication to important groups of potential clients (Cutler et al. 1985, Garrett 1986, Roling 1988). In most rural African communities major sociological and political blockages keep the poor, women, and various other minority groups like pastoralists or landless refugees from participating in formal extension programmes. It is highly unlikely that the official system can reach such clients simply by declaring that they are of priority concern — the mistake donors made in the 1970s. Specific changes in how extension is organised, and in the procedures for selecting and dealing with clients are needed. The institutional options we shall review in Chapter 4 have distinctive ways of targeting and involving potential clients; targeting systems must be devised which are suited both to desired clients and to the delivery organisation. All in all, the conclusion which emerges from this chapter is that organisational issues are

of central importance when reviewing reasons for the low productivity of Africa's present extension services.

4
Organisational Alternatives

Seven main types of alternative structures for providing African farmers with extension advice and agricultural support services will be discussed in this chapter. It usually happens that several approaches are found in one country. While the extremes correspond to the distinction between 'public' and 'private' services, much extension occurs within intermediary, mixed institutional types (parastatals, associations and projects). A parastatal corporation may assist cotton growers, while coffee growers receive their help through co-operatives. Maybe there is an 'integrated rural development' (IRD) project serving one province, even though the Ministry's own 'extension service' promotes increased food production in all provinces. Most countries also support an array of training institutes dealing with rural development. While all these institutional forms rely upon similar extension techniques — farm visits, demonstration plots, short course training, meetings, and extension 'packages' — they differ greatly in how they organise the support and advisory functions, see Table 4.1.

(i) Ministry-operated extension services

This is perhaps the most widely found type, probably just as a matter of administrative convenience. Most African governments moved rapidly to expand publicly funded services once Independence had been attained. In countries with a significant minority of immigrant settler farmers, publicly-financed extension services were provided to the large-farming sector from the start. A multi-functional, ministry-supported service is also well suited to field crops (like maize and legumes) and tends to accompany the expansion of other public services.

In those countries which have opted for a generalised field service linked to the Ministry of Agriculture, such services typically number a thousand or more employees with perhaps 20% being specialists

Table 4.1 Extension System Characteristics

Ministry-based Extension Service	*Commodity Handling Organisation*	*Commercial Input Suppliers*
defined by broad function	defined by crop grown	defined by customer network
follows territorial hierarchy	grouped by crop zones	grouped by company clientele
operated from Ministry office	logistic base from crop processing factory/unit	organised by local suppliers
relies upon resident staff	relies on agency buyers	relies upon salespeople
financed from public funds (mainly staff salaries)	financed by crop handling charges on marketed crop	financed by user charges & input purchases
focus upon annual campaigns recommended practices	focus on increased output use of provided inputs	focus on use of purchased seeds, fertilisers & agrochemicals
technology derived from official research stations	technology derived from industry-based research	technology derived from parent suppliers
vulnerable to bad packages bureaucratic apathy	vulnerable to high overheads monopolistic rigidities	vulnerable to large-farm bias local exploitation
defined by society membership	defined by contact network	defined by geographic area
grouped by community & crop marketing organisation	active membership with local leaders	grouped by community and scheme
run by co-op. officers & society committee	run by local committee and outside organiser	supervised by external experts and project committee
logistic base in co-op. office/crop processing unit	logistic support variably provided: outsider, leaders	project office established with external resources
financed from crop marketing charges, deducted on turnover	financed by member contributions, external grants	financed by donor grants & loans plus public funds
focus on increasing turnover value added crop handling	focus upon community projects, local needs	focus upon acceptance of a given technical package
technology linked to co-op. processing and marketing	technical support variable sometimes problematic	technology from experts & international research
vulnerable to corruption	vulnerable to NGO withdrawal	vulnerable to jealousy and project termination

recruited on the basis of advanced technical or scientific training.[1] Comparative staffing figures available from published sources are of relatively little use because countries differ greatly in how they define membership in the extension service. When all agriculturally-related Ministry employees are included, as in Kenya or Tanzania, the total number may exceed 5,000, which represents a significant staff commitment for a poor country. African countries which have ministry-supported extension services need to pay close attention to increasing the effectiveness of such investments.

Irrespective of size, ministry-operated extension services have certain traits in common. They are generally quite hierarchical, with staff seeing themselves as civil servants rather than farmers' advisers. The hierarchy usually (though not always) follows the territorial sub-divisions of the general administration, so that at each level (ward, division, district, province) there will be a representative of the agriculture department. The scope of activity is defined functionally, and staff recruitment is based in the first instance upon technical and professional qualifications. In addition to the dispensing of agricultural information, staff are frequently engaged in administrative and regulatory duties (collecting statistics, supervising credit, inspecting crops, etc.).

An administrative organisation of this type must deal with many side issues which from a theoretical standpoint have little to do with the educative role usually assigned to 'extension' (see Table 4.2). Much internal friction arises. Staff morale in the field may be low because salary levels and resources are much less than those at 'headquarters'. Extension agents may be forbidden to process and disseminate research results until these have been passed through a cumbersome formal review system. Middle-level supervision tends to be weak, since staff define their duties in terms of administrative routine rather than task accomplishment. Various technical specialities outside the department's main responsibility

1. The best described ministry-based systems are from East Africa. Sources on Kenya include Cohen and Hook (1987), Heyer and Waweru (1976), Institute for Development Studies (1975), Kimani (1989), Leonard (1973, 1977, 1987b, 1988), Moris (1973), Mutiso (1979), Staudt (1978), Trapman (1974), Thirtle (1989b), and the Republic of Kenya (1984). For Zambia, see Burdette (1988), de Jong and van Donge (1983), Due (1988), Francis and Rawlings-Branan (1987), Good (1986), Howell (1988), Quick (1977), and Sutherland (1987). For Zimbabwe, see Cousins (1988), de Jong (1984), de Valk and Sibanda (1986), and Norman (1986).

Table 4.2 Issues in Extension Supply Organization

- Where to locate subject matter specialists
- creation of an information packaging capacity
- How to integrate livestock planning, extension and services
- Where to put various specialised services, e.g. soils survey, machinery testing, mapping and land use, entomology, library and documentation.
- Provision of market information and marketing services
- Liaison with input supplies and credit
- How to offer and support farmer training
- Whether to operate higher level training institutions, and, if so, how to provide curriculum support, inspection, training materials, and examinations.
- How to recruit, evaluate, and promote staff
- How to target 'technical packages'
- How to liaise with or to organize research services
- Whether field agents should run adaptive research trials
- How to select and prepare for new programme emphases
- How to gather planning intelligence on the agricultural sector
- Co-ordination of technical assistance and external projects
- Degree of involvement in sponsorship of farmers' organisations
- Whether to give separate support to women's and youth groups
- Provision of transport and communications to field staff
- Management of Ministry housing, stations and farms
- How to adapt standard budgeting to fit technical needs

Source: Moris (1986b), p.29.

are often neglected.[2] Many ministries still rely upon a confidential supervisor's report as the main basis for staff promotions, leaving individuals unsure why they have been passed over even when they feel they are working hard. There was also in the past a tendency to concentrate upon certain crops: cotton, tobacco, coffee, or maize rather than upon the bananas and legumes which are so crucial to diet in much of Africa. These days perhaps the biggest problem faced by ministry-operated services is financial: how to obtain the vehicles, equipment, and inputs needed for effective operation. An increasing share of the total budget is absorbed into salaries (above 80% in some countries), so that unless a department is lucky enough to have an externally financed project, it will find field staff stranded with very little left for activities once salaries have been paid.

2. Again and again, certain topics (farm planning, soil surveys, bee-keeping, small-scale irrigation, etc.), while represented in the staff establishment, are in effect left 'floating' without a budget or an operational field capability.

Some advisers (Benor et al. 1984) insist that many of the duties typically assigned to ministry officials should not be part of extension responsibility. For African extension personnel, however, the problems are not so easily resolved. Individual officials do not have authority to change the definition of their own duties. Most departments of agriculture will continue to control various subsidiary institutions like research institutes, experimental stations, farmer training centres, and agricultural service centres. Ministry staff will find themselves on occasion organising the supply of fertilisers and seed for communities without input suppliers, approving credit, or carrying out field surveys. Some will be assigned to teach within lower level training institutes, and others may find themselves forced to interact with external agencies such as an irrigation parastatal or a livestock development ministry in order to achieve desired results.

This array of tasks is not covered within 'extension theory' as usually taught to agriculturalists, but also is not well served by standard 'management theory' oriented to office administration. These issues are examined further in Chapters 6, 7 and 8. The main point here is that the difficulties are in large part structurally rooted.

(ii) Export crop parastatals

While the main focus of this book is on government extension services, the bureaucratic problems mentioned above have led many African countries to see the export crop parastatal or commodity board as an alternative. The essential change is to establish the organisation as an independent, cost-recovering entity operating outside civil service regulations, in the hope that it will be more commercially oriented. A second basic characteristic is the vertical linkage of all services concerned with a particular export crop, including adaptive technical research, credit, supply of planting materials and inputs, and single-channel marketing. This highlights the interconnections between different technical services, and facilitates the recovery of costs from growers.

In several cases, marketing boards which had accumulated price stabilisation funds in the 1950s were subsequently reconstituted into crop authorities responsible for supplying all necessary production services to their growers. By offering better salaries and a clearer definition of duties, these parastatals had an initial advantage in recruiting and retaining technical staff. The two best known examples are the CFDT-linked national cotton-growing companies

in francophone countries, and Kenya's Tea Development Authority (the KTDA).[3] However, the British-American Tobacco (BAT) Company's programme in western Kenya has also been highly successful, and while not a public parastatal shares many of the organisational traits of the KTDA and CFDT programmes.

These 'cash crop' extension programmes have certain features in common:

- A clearly demarcated zone of operations
- A system for selection and registration of growers
- Maintenance of a strict ratio between growers and staff
- Clear technical packages developed by the organisation's own adaptive research
- Crop financing for growers, including the supply of inputs
- Controlled, single-channel marketing by the agency
- Target acreages, with provision of staff and funds to match aggregate production
- Field staff provided with all necessary resources (transport, equipment, training, etc.)
- Close supervision of growers and of field staff
- An annual planning cycle for each year's campaign.

These organisational safeguards, if carefully implemented, should have the effect of ensuring relatively high yields and greatly lowered production risks (Blume 1971, Ruthenberg 1968).

The apparent success of the CFDT-linked companies in West Africa and the KTDA in East Africa brought about a rapid increase in the numbers of commodity organisations of this type in the 1970s. In the francophone countries, such agencies became the predominant mode for offering technical extension services to smallholders. Unfortunately, however, they have not experienced the same degree of success as the CFDT and KTDA at first achieved. Their specific weaknesses are now widely recognised:

- Difficulties when international prices fall below local production costs
- Problems when the agency begins to take over general extension
- A tendency to expand processing capacity too rapidly, leading to a large debt burden and high unit costs
- Political pressures to add too many low-level workers

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3. The KTDA model is described in Blume (1971), Lamb and Muller (1982), Paul (1982), and Moris (1973). For the CFDT programmes, see de Wilde (1967), vol. 2) and Mahdavi (1989).

- Rapid growth of middle-level staff without an accompanying increase in productivity ('premature professionalisation')
- Availability of external loans has brought rapid increases in the debt-servicing burden
- Failure to keep staff benefits under control, so that overhead costs rise rapidly
- Frequent accountancy problems, including fraud and the failure to monitor internal cost centres
- Squeezing growers' profit margins to recover higher unit costs without instituting appropriate ceilings on agency costs
- A breakdown in the timely supply of inputs and services
- Long delays in payments to growers for crops received.

These days, many African crop parastatals are insolvent. They have come to depend upon annual subventions from the government in order to remain in operation. The economic and political pressures creating this situation are so powerful that they override most of the advantages which a vertically organised system of producer services might otherwise enjoy.

(iii) Commercial firms

The 'private sector' is in many African countries an especially heterogeneous category. At the top, there are almost always some well established, multinational firms. Then there will be a few politically favoured wealthy traders, sometimes including the wives of ministers and prominent politicians. Next come a motley assortment of contractors and input supply firms, many of them owned by expatriates. There may also be a network of small-scale family businesses trading in livestock, exports, and retail goods, which remain in business by evading many of the formal controls. Locally, traders in Africa are often from a different religion, ethnic group or even nationality from the surrounding farmers.

The kind of commercial infrastructure needed to supply good seeds, store fertilisers, maintain and repair equipment, and purchase crops is easier to develop under open markets dominated by large farmers. It is no accident that in Africa the vigorous input supply services exist in countries which had immigrant 'settler' economies: the Kenya highlands, northern Tanzania, Zimbabwe, and Swaziland. After independence it was fairly easy to extend access to smallholders, whose rapid entry into an already established system of commercial suppliers compensated for the dwindling numbers of large farmers. The 'success' of these commercial services

is, however, a rather special case. The crops grown were either estate crops (tea, coffee or sugar) or else mixed grain and livestock produced on favoured, highland soils. The initial commercial growth took place before currency and import controls were instituted, and the companies involved were seen after independence as protecting a valuable national asset.

Elsewhere, however, the commercial sector remains polarised between a few large firms at the top, with no particular commitment to high-risk agricultural supply ventures, and numerous small trading families at the bottom without the technical skills required for modern agricultural development. The imposition of rigid import controls in many countries creates problems for equipment suppliers and small-scale mechanical services. Traders must also cope with high transport costs and huge storage losses, plus tremendous and unpredictable swings in the volumes of commodities traded. There are movement permits to be obtained, bribes to be paid, and armed bandits to avoid. Those who succeed do so by exploiting their workers, by minimising the employment of salaried professionals, by switching rapidly between commodities, by smuggling, and by monopolising the local supply of credit and transport. No doubt these actions contribute towards economic efficiency, by keeping commercial supply in operation under conditions of high risk and extreme adversity, but they do not result in a form of commercial organisation suited to external support by those promoting rural development.

(iv) Marketing co-operatives

The public sector alternative to the private purchase of farmers' crops is, of course, the marketing co-operative. Many African governments chose to emphasise these in the immediate post-Independence period. By grouping smallholders into co-operatives, it was intended to reach a commercially viable turnover which could justify joint processing and bulk transport arrangements. At the same time the larger number of farmers involved would merit organised supply of inputs, financed through deductions from each grower's crop payments. For coffee, tea or tobacco, the imposition of single-channel marketing left growers with no alternative but to join a co-operative, which undercut the local traders who might otherwise have handled these crops through normal commercial channels.

Marketing co-operatives typically have at least two levels: i) primary societies, which group several hundred local growers into a common association with the responsibility to collect and market members' crops and also sometimes to handle inputs like fertilisers and insecticides; and ii) co-operative unions, which provide primary societies with services like transport, auditing, training, and finance. The unions in turn may report directly to a Co-operative Division within the government, or may come under a tertiary, national level movement. Sometimes there is a national Co-operative Bank. Often unions operate ancillary commercial services like hotels, input purchasing and storage, tractor hire, and crop processing. The basic principle underlying co-operatives is that members exercise equal voting power and enjoy the benefits in proportion to the business they commit to the co-operative. Costs are recovered through fees for services and cesses charged against the crops marketed.

The problems evidenced by African growers' co-operatives have been legion.[4] A number of them are, however, intrinsic to a situation where semi-subsistence farmers are encouraged to pool their economic activities in circumstances characterised by weak institutional support and high risks. The difficulties to be expected include:[5]

- A general inability of illiterate growers to control their society's business through the mechanism of the annual members' meeting
- Poorly designed accountancy systems, making it hard to relate costs to returns or even to prove what has been done in members' names
- Long delays in the submission and approval of accounts, which thereby lose their relevance either for control or for management
- Temptations to staff occasioned by handling of cash in remote areas without adequate banking outlets
- Misuses of transport and equipment by committee members
- Failure to recover costs from growers who can evade the formal marketing machinery
- Involvement with small volume, low-value crops in marginal areas where losses and transport costs are typically high

4. See a useful early report by Kriesel et al. (1970), also Quick (1977) and a case study by Nelson (1967) which indicates how such difficulties can be overcome.

5. From a review of co-operatives in Tanzania, Moris et al. (1985:306). General issues are reviewed in Peterson (1982).

- Lack of trained staff at the village level capable of preparing accounts or managing warehousing
- Competition from local traders in the early years when volumes handled may still be very low
- Negative impacts following 'top-down' attempts to organise growers before there is any local interest or commitment
- Frequent political interventions, e.g. imposing candidates upon local organisations or exempting insolvent societies from loan repayments to the union level
- Increased bureaucratisation at the union level, with a consequent overheads burden on the primary societies
- A continuing loss of better staff to other sectors.

With so many structurally related difficulties, national leaders would do well to avoid imposing further burdens. In particular, primary societies should not handle highly perishable crops, should not be asked to operate retail shops in addition to their agricultural business, and should not be subject to political interference in the choice of their leaders. At the union level, co-operatives would do well to avoid becoming responsible for various ancillary services — bars, hotels, transport businesses, and the like — which can easily become loss-making if not tightly managed. Good management is, in fact, a critical ingredient in co-operative success. In their early years, co-operatives were sometimes the only channel for enterprising young indigenous managers. Today, however, they compete for staff with parastatal corporations and multinational business.

(v) Farmers' and village associations

When extension operates through individual farm visits, certain 'progressive' farmers are inevitably seen as gaining an unfair advantage. Moreover, the small numbers of extension workers make some type of group contact all but unavoidable if the aim is to serve everybody. Thus Africa's socialist countries in particular have emphasised group approaches, based sometimes on farmers' co-operatives but also on village associations or other forms of mass mobilisation. Such approaches have much in common with government-sponsored co-operatives, though they usually entail working with all producers rather than only registered growers.

From the Ethiopian and Tanzanian experiments with village development, the following features seem to be characteristic of a group-based approach:

- Extension workers are often directed to work only with groups
- An initial step taken by the government has often been to require farmers to live in registered villages, the rationale being to achieve economies of scale in provision of services and to stimulate peasant mobilisation
- Villagers are usually required to establish a common farm, in the expectation that this will facilitate tractorised land preparation
- Most villages are also expected to conform to a standard layout, sometimes permitting only uniform sized houseplots
- Each village must have its own internal organisation, which usually consists of a leadership committee and an assembly
- The intention is that villagers will generate their own capital improvements and may eventually employ their own extension agents
- The leadership for planning and co-ordinating rural development comes from the general administration and politicians, not from the Agriculture Department.

The fairly ambitious expectations which national leaders initially held were frustrated by the many practical difficulties encountered. It seems in retrospect that the peasant mobilisation rationale fails to recognise a number of significant obstacles to be found in an African environment:

- Difficulty in actually realising the 'economies of scale' which were supposed to make the new approach profitable and appealing at the local level
- For individual peasants, the loss of their homes (through physical relocation) generated hostility and suspicion about the government's motives
- Tractorised farming has proved difficult to operate profitably, leading to high rates of breakdown and inefficient use of imported equipment
- Extension workers have resisted the instruction to live inside the villages they serve, just as villages have had difficulty in paying workers' salaries
- Financial discipline needed for the operation of common farm enterprises and village shops has been poor. Losses have tended to discredit the whole programme
- Difficulty in allocating work and sharing profits fairly. African peasants are used to private ownership of productive assets other than land
- Times of drought and warfare (encountered by Tanzania,

Ethiopia and Mozambique) have made it very difficult to achieve a well-planned and smooth transition
- In general, the high levels of risk in African farming make it much harder to realise profits from group farms and other village enterprises.

These lessons are tentative. Aside from the well-documented Tanzanian experience, not much is yet known about how extension reforms in Ethiopia and Mozambique have fared.[6] Any fundamental reorganisation of the fabric of rural life is bound to take longer to achieve increased output. However, there is sufficient evidence to warn that one cannot assume that villagisation will be sufficient by itself to generate substantial increases. Close attention to the adequacy of technical services and extension packages therefore becomes critical.

(vi) Project-based extension

There are numerous examples of technical assistance projects which include a formal commitment to strengthening agricultural extension, such as Ethiopia's package programme of the 1960s, Malawi's World Bank-assisted Lilongwe Project in the 1970s, or Tanzania's GTZ (German)-assisted coconut project in the 1980s. Because of the involvement of an outside donor, such projects typically enjoy better resources and more expatriate staff than the ministry-operated services outside the project area.

Some characteristic features include:
- Confinement of extension activities to a delimited project area
- A large role given to expatriate 'experts'
- Financing often includes a commitment to a particular institutional or technical innovation
- The field team is typically provided with its own logistics and perhaps an entire base of operations
- Some donors insist upon a separate 'project management unit' in charge of supervision and accounting for the project
- Outside 'experts' are supposed to be given 'local counterparts'

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6. Published sources describing the Ethiopian system since the revolution include FAO (1983a), Cohen (1987), Stavis (1977), and Rahmato (1984). Main sources on Tanzanian villagisation include Maeda (1981), Mwansasu and Pratt (1979), McHenry (1979), von Freyhold (1979) and Kjaerby (1989); on extension, see Hansel et al. (1975), Moris et al. (1985) Sudad (1980), and ILO (1982).

to carry on activities after project funding comes to an end
- Activities are often justified as being part of a 'pilot project' intended for wider replication and adoption.

Project-based extension typically goes through a development cycle. It usually begins slowly, with genuine field extension only in the third or fourth year of a project's life. Then, once project termination looms, there is a running down as staff leave and the field unit struggles to become reintegrated into the larger national system. Not surprisingly, instances of 'success' often come just before this point. A much less optimistic view of project achievements would be obtained if they were measured several years after a project ends.

The main problems field staff are likely to encounter are:
- The higher resource intensities make subsequent replication within the general extension service very unlikely
- A tendency to consume a large proportion of resources on baseline surveys and the establishment of a temporary logistic base
- Staff, both local and expatriate, tend to become the immediate (unintended) beneficiaries
- The role of the 'counterpart' is inherently frustrating, with consequent friction
- Pressure to show immediate results, leading to fictitious reporting
- Often the equipment introduced cannot be serviced or replaced locally
- Innovations introduced under an external project will be seen by the host government as the outsider's responsibility, and often are quickly abandoned once external funding ceases
- When the project team is disbanded, its equipment and resources are often given out to less favoured areas.

Improvements which do occur are usually short-lived. They depend heavily upon the enthusiasm of a few key individuals, as well as on the extra financing and resources supplied from outside. In sum, these tendencies explain why few donor-assisted 'pilot projects' actually achieve a lasting impact on the local system.

(vii) Training institutions

Developing countries are these days endowed with a fairly complete set of training institutions. In addition to those under the Ministry of Education (such as higher education and perhaps school

agriculture), most Ministries of Agriculture have several institutions of their own, providing:

- Sub-professional Certificate and Diploma technical training, usually at residential colleges
- Some sort of in-service upgrading facility, perhaps called a Centre for Continuing Education
- An agricultural information service with its own library and audio-visual production capacity
- Various farm-level institutes (run either as farming training centres or under community development)
- Cross-linkages to university training, teacher training, co-operative training, and various research institutes.

These activities clearly overlap with those of the general extension service, to which they provide staffing and a skill-deepening capacity.

The diversity and number of such institutions can be explained on several grounds unrelated to their actual impact. To civil servants, training is often accepted as the essential component in modernisation, irrespective of an organisation's immediate constraints. There is also a tendency for each ministry to believe it must possess its own training college and subsidiary institutions. The manpower shortages in the immediate post-Independence decade made it easy to argue for additional facilities, and these were attractive to donors looking for high visibility projects.

In theory, one can make a fairly strong case for agricultural training. As an agricultural system evolves, it demands increasingly more sophisticated skills, which are too complex to be adequately conveyed in a brief extension meeting. Training sessions for staff build up group morale and keep individuals abreast of technical development in their field. Training also provides a welcome break from normal routines. Seminars give an opportunity for highly skilled specialists to meet clients and farmers. And, of course, the teaching modules and demonstrations prepared for formal instruction can also be put to good use outside the classroom.

However, in reality the physical investment dedicated to training often outruns local support capacities. Effective training, especially in agriculture, requires a great deal of organisational 'software': teachers, trainee selection, instructional modules, demonstration sites, follow-up, and the like. In practice, agricultural training often leaves much to be desired:

- Excessive duplication is common between institutions, with each

ministry trying to operate its own underfunded programmes
- Formal, in-class instructional methods predominate, even for subjects and skills which should be practically based
- The content of the lectures and practicals often bears little relationship to learners' actual needs
- Most topics are broken down for presentation into their disciplinary components, even though the major problems are often of an interdisciplinary nature
- Teachers frequently feel disadvantaged, trapped into low visibility assignments where even if they do a good job there are few opportunities for promotion.

The key point is that these disabilities are organisationally unnecessary. There are well recognised tactics for alleviating most of the training problems, provided that unit managers are willing to go beyond the formalised conventions they have inherited (Honadle and Hannah 1982, Peuse and Mbaga 1987).

Conclusion

The organisational options reviewed here are all in touch with farmers, and all offer types of rural development support. They are, then, in some degree service delivery systems — particularly the first four types, which can 'stand alone' as relatively complete support systems. Community groups, field projects and training tend to be an adjunct to buttress the overall impact of a 'stand-alone' comprehensive delivery system.

For each of these types, some outstandingly successful cases do exist. However, the *average performance* will be much lower. It seems to be a characteristic of rural development organisations that within each category one finds a wide range of performance: one or two successes, but many failures. This suggests that having a good model is not necessarily sufficient to ensure good programme performance. The KTDA, for example, was outstandingly successful in Kenya, but when copied in Uganda and Tanzania yielded very disappointing results.

The quality of internal management remains a significant reason for the outstanding instances of programme success. In African agricultural development, the influence of key individuals seems to be greater than elsewhere or in other sectors. There appear to be several reasons for this. Most of the field programmes evidence a relatively poor fit between organisational requirements and what the environment can supply, thus requiring a great deal of

management intervention. Where services are part of a network (with multiple agencies serving a given crop industry), their effectiveness depends in part upon the output of other units which they do not control. This necessarily involves managers in bargaining and mutual accommodation, to ensure the minimum conditions for success. And, of course, the high salience of unpredictable environmental variables in African agriculture imposes considerable tension upon the managerial system.

The features summarised in Table 4.1 suggest that the immediate choices facing managers vary a great deal between organisational types. The variations include how activities are financed; whether managers are full-time, salaried staff or voluntary; the quality and numbers of staff deployed; linkages to sources of technological support; whether the system brings professionals into direct contact with farmers; which services are bundled together under one organisation; and the degree of upward influence allowed to the clients themselves. To the extent that management differs according to its task environment, then, we would expect organisations to show quite distinctive managerial patterns. Management of a growers' co-operative is not the same as management of a commercial input supplier, even though both organisations may be performing a similar service.

There would seem to be considerable scope for identifying how effective managers operate in each of these contexts, looking at the interaction between task demands, organisational setting, and managerial tactics. Few extension analysts employ an organisational and managerial perspective. Consequently most prescriptions for improving performance reflect analysts' normative ideals rather than being based on knowledge of the competences field organisations actually possess. Adoption of a 'contingency' perspective towards extension administration is long overdue within extension science.

5
What Goes Wrong?

Throughout Africa field staff in the lower levels of agricultural bureaucracies often encounter very difficult working conditions (Moris 1981, 1987; Wiggins 1988). However, the degree of potential difficulty is frequently not immediately apparent because the field bureaucracy has accommodated itself to immediate constraints by reducing output to a level which appears to meet its own demands. Evidence that all is not well at a deeper level abounds on every side: vehicles lie scattered around the compound because nobody has been able to obtain spare parts; professional staff spend long stretches immobilised because of shortages of fuel or transport; crises which threaten the entire local economy develop but nobody acts; the accounts and annual reports may be years in arrears, so that when they are published they have lost all operational significance; and many experiments are simply not completed because of various easily anticipated operational problems.

And yet, on a day-to-day basis life seems reasonably tolerable. At least salaries get paid and people appear in their offices; *bureaucratically* the system is treated as if it were fully operational. In Africa, we often face the paradox that extension systems which one would expect to be severely overstrained appear on a short visit to be nearly somnolent. Let us examine this paradox in regard to three factors.

(i) Structural reasons for tension

Policy-makers need to give greater recognition to the underlying structural reasons why agricultural management is almost always more difficult than other types of public service. Any bureaucrat in charge of agricultural activities can quickly itemise them. First, of course, is the fact that plants and animals have continuous requirements. This means working after official hours and over the weekends, and being responsible even while on leave or during

official holidays. Second, many agricultural activities are highly seasonal. The amount and nature of support they require can fluctuate enormously over the season. Third, agricultural production in the tropics is typically subject to high levels of uncertainty: floods, disease outbreaks, locust invasions, drought, price fluctuations, and input shortages, any of which trigger an organised response from the agricultural service system. Fourth, there is the unavoidable fact that negative influences upon production accumulate over the season; a slip-up anywhere along the chain contributes to an overall reduction in output, while with some crops (like cotton or tobacco) problems at the very end may nullify all previous efforts no matter how efficiently they were performed.

However, it is true that the particular sources of tension vary between jobs directly responsible for production and those which manage the delivery of services to farmers, as the following lists demonstrate.

Production management
(e.g. a research station farm)

- animals must be fed and watered on weekends and over holidays
- water pumps must be kept in operation, even after hours
- security must be maintained at all times
- specialised veterinary and disease control expertise may be required
- inputs must be stored on-farm
- dangerous chemicals are in use
- transport may be required at short notice
- activities are seasonally variable but unpredictable
- money must be held on-farm
- petty cash expenditures occur throughout the season

Service delivery management
(e.g. a district office)

- different zones and crops must be served
- the clientele is scattered and hard to locate
- staff must be posted to work in remote and inaccessible places
- specialised help may be required at short notice
- bulk purchasing of inputs for farmers may be necessary
- quarantine arrangements must be kept operational
- sometimes salaries must be delivered to staff
- a rapid response must be organised if there are outbreaks of disease
- the work programme must be capable of modification at short notice

The key point is that agricultural managers must be prepared to act in ways which a bureaucratic system has difficulty in countenancing. Anywhere in the world, bureaucratic units have difficulty running farms; and some argue that they are not much better in offering agricultural services. Thus, in developed countries, the usual approach has been to move towards a professional mode of field organisation with highly skilled field staff who can act at their own discretion. It becomes acceptable for the organisation to provide a vehicle and expensive equipment to a field professional.

The greatest tensions arise in organisations which are instead organised like a 'machine bureaucracy' but which continue to hold major agricultural responsibilities. The typical civil service organisation concentrates on offering routine services, and hence defines its task as 'agricultural administration'. Often the field staff in contact with farmers are poorly trained, poorly supported, and poorly paid. Those with specialised training gravitate into mid-management administrative positions or into research and training institutions separate from the extension service. The weaknesses characteristic of this type of institution were itemised in Chapter 4, so at this point we simply emphasise the pronounced difficulties 'public servants' face when trying to meet agricultural service needs.

Take an example from the mid-1970s in northern Tanzania. Two crates of day-old chicks are delivered to the local airways office, on a Saturday afternoon when the office is closed for the day. Consigned to the local veterinary office, they should have arrived on a 9:30 am flight, but actually arrived at 2:00 pm after the veterinary offices also closed for the weekend. Some are dead already. Yet each participant can blame somebody else: the veterinary department will blame the local airline office, the airline office will blame the late arrival of the flight, the airplane staff will blame the sending agent for having put live chicks on a weekend flight (which is often overbooked and late), and so it goes up the chain. What might seem a routine transaction actually requires a great deal of extra effort which managerial staff must contribute on their own initiative. Much of the time the effort is not forthcoming, so that (as in this case) planned activities are simply not carried through to effective completion.

The structural explanation is, then, that a 'machine bureaucracy' which conforms to the ideal of an African Ministry of Agriculture is not able to respond in ways required by the associated agricultural systems. Field staff lack the commitment, authority, and resources

to act in resolving local problems; by the time they can organise necessary support 'from above', the opportunity will have passed. This is, I believe, the main reason why so often in Africa public agencies responsible for agriculture are given parastatal status, allowing them to evade cumbersome and ineffectual civil service routines.

(ii) Typical field problems

The many project evaluations and case studies of African agricultural development throw up a long list of implementation difficulties (Moris 1981:24, Morss and Gow 1988), more than can be explained by reference to structural tension alone. It seems that African environments contain additional features which augment the difficulties facing field managers. There are many 'proximate' causes of increased tensions: the extreme poverty of African countries, their large debt burden and associated economic distortions, the militarisation of the countryside, drought and locusts, and the rivalry between social groups. Beneath these obvious points of tension are five underlying factors, often themselves only symptoms of still deeper, unresolved tensions.[1] If so, major improvements in performance cannot be achieved over the longer run until the structural causes are dealt with — an observation we take up in the third section on 'systemic interlock'.

(a) Low staff morale

Low staff morale comes first on our list, because it has become endemic in contemporary Africa and if allowed to persist lowers the productivity of the entire system. There are a few exceptions: staff in externally supported projects have less to complain about than those in resource-starved mainline ministries. And, of course, some countries have managed their economies more successfully or enjoy access to a convertible currency (like the CFA in francophone West Africa) so that local commercial services still function and official programmes remain operational. However, in many other countries the rural areas have been afflicted by drought, locusts, warfare, and inflation to such an extent that few district staff have any substantial resources left for carrying out field activities.

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1. For extended reviews of this topic see Hyden (1983) and Moris (1976, 1977, 1983b).

Nevertheless, low morale was a major problem even before Africa's economic difficulties became so overwhelming. One reason can be related to the sociologist's concept of *relative deprivation*. For example, field surveys sometimes show that the better educated young male extension workers have lower morale; they are often the rejects from an educational system where those with only slightly better secondary school results have gone on into higher education and much better career prospects. The young extension worker is thus somebody who failed science and mathematics (key subjects needed as a background for agriculture!), and who continues to hope he or she can somehow get back into higher education or at least an urban assignment where promotion prospects are better.

Another reason is the widespread perception that agricultural assignments require harder work and provide less chance for official recognition than other similar civil service jobs. In agricultural extension, much of what one does will be invisible to those who may influence one's career advancement. Working with farmers means risking being away from post when there is an unannounced official visit from ministry superiors, and, similarly, missing district and party meetings. Working to impress district officials and leaders will cause conflict with an extensionist's own ministry's programme, and will mean spending much time at headquarters or on official reports while the field programme suffers. Particularly in extensive areas like those served in rangeland development, even when an extensionist is doing a good job, only a small proportion of this activity will have visible results to his superiors. Thus, the extensionist's job assignment is subject to far more *structured misperception* than other rural service occupations. Field staff who realise this are bound to show lower morale even if for other reasons they continue to work energetically.

These intrinsic causes of low field morale become amplified once the economic system begins to fall apart, as it did over much of rural Africa in the late 1970s and early 1980s. One of the first components to suffer is the budgetary support required for the operation of field projects: initially, a lack of development finance, but subsequently also shortage of recurrent funds. Since supervisors try to safeguard payment of salaries, as a department's revenue base shrinks relative to demand it is common that all field allowances and discretionary payments are cancelled. This takes away the incentive to carry out work away from post, and affects those in the more difficult

locations who might otherwise enjoy hardship allowances of one kind or another (African countries differ greatly in the allowances they offer).

A more serious stage is entered when there are no longer the resources to keep staff mobile: a lack of vehicles, spare parts, and fuel throughout the field service. Such shortages have severe impacts in any arm of government, but for agriculturalists to be confined to office means that supplies cannot be delivered to villages, and field staff are rendered ignorant of what is happening at the local level. Within the Ministry, supervisors who no longer travel fail to observe the actual performance of field cadres. Staff and equipment are forced to spend much of their time in a state of lethargy and enforced idleness.

The disincentives to adequate task performance become even greater when inflation reduces fixed salary levels below a living wage, or when, ultimately, a government may fail to meet its salary commitments. Currently in Sudan, for example, comparisons of actual purchasing power suggest that middle-level civil servants earn about a third of what their salaries would have purchased in the early 1970s. In several African countries, the monthly wages received by extension workers barely cover a week's expenses. Wiggins' study in Sierra Leone found that the failure to pay salaries due to field staff was the biggest single problem agricultural managers had to deal with (Wiggins 1988).

Why, then, do field staff bother to stay in post under such conditions? One reason is that when an economy deteriorates so markedly, a rural posting may be more tolerable than an urban assignment. In some countries field staff still qualify for housing — a scarce and expensive commodity. Then, too, agriculturalists are able to acquire limited stocks of seeds, fertilisers, and other inputs if and when these do arrive within the local system. Most agricultural stations have extra land which staff members farm and which can provide a real income substantially greater than the regular salary. Often higher-level officials enjoy access to more ample station electricity, water, and perhaps fuel than they could otherwise expect even though supplies are uncertain and erratic. And, finally, the hope of obtaining further training as a route out of immediate difficulties can be a potent incentive for staying in those projects which enjoy external support.

Nonetheless, the fact remains that for a large amount of the

existing labour force, morale has sunk to very low levels. There are three consequences which affect extension management.

First, extension planners need to recognise that the causes of low morale are cumulative and mutually reinforcing. Over time, the system becomes nearly impervious to reform by the usual array of policy instruments, which might have been effective if implemented at an earlier stage before the negative tendencies became so highly interconnected.

Second, low morale within an administrative system has a pervasive negative impact across the whole spectrum of departmental activities. People at all levels become less flexible and less effective in dealing with day-to-day problems. The organisation as a whole ceases to learn from its mistakes, since staff at any level can point to external obstacles as the cause of their own lower performance. Thus problems which could have been resolved by determined action will be left to fester for months on end. These tendencies become an enormous, invisible load which further depresses the output which an already overstrained agency can achieve under difficult working conditions. Unfortunately, the most demoralised staff tend to be those in direct contact with farmers.

Third, the causes of low morale associated with economic distortions lie outside the control of field extension managers. While training in teamwork, leadership, employee evaluation and other skills might improve a manager's ability to raise morale in developed countries, these same skills are insufficient as remedies in most African contexts. The things making the most difference to employee morale are structurally constrained by a deteriorating national economy, and cannot be improved by individual field managers.

One wonders how such situations can continue much longer. Indeed, civil servants are beginning to 'vote with their feet' by taking employment with NGOs or by joining strikes (cf. a nation-wide strike of all Sudan's agricultural graduates in July of 1988). Outside advisers from donors like USAID or the World Bank have relatively little to say about such problems, which are rarely encountered in the professional services of a developed country.

(b) Bureaucratic stasis

Bureaucratic 'stasis' can be viewed as the ultimate result of bureaucratic inertia, and is probably similar the world over. What varies, however, is the effort needed from individuals to make their

systems work. Most hierarchical agencies require that administrative actions go through several steps before being finally approved, and, even then, may require further actions before the anticipated result occurs. For example, in Tanzania during the early 1970s it took 22 steps to get an officially backed housing loan. Thus the complexity of actions can be a major obstacle for external clients who are trying to obtain a given official service. However, it can be just as difficult to obtain action from within by 'access bureaucrats'. At this same period in Tanzania it could take more than 40 separate administrative actions to get a damaged vehicle 'written off' from the departmental register. As a consequence, many African field stations are ringed by rusting wrecks of Land Rovers, tractors, and other inoperable equipment.

The difficulties become compounded under Africa's current economic distortions, and to the internal frictions must be added further layers of obstacles and complications often found within rural development because several different agencies and departments must co-operate. The problem exists vertically, because funding requests must go through a long chain of approving and review meetings, and horizontally, where governments have tried to impose territorially based councils and committees which are meant in theory to improve interdepartmental co-ordination. Every layer added means another opportunity for somebody to veto or delay some aspect of a field programme. Again and again one finds that things are allowed to drift because nobody feels directly impelled to take the initiative. Actions which are launched require a huge lobbying effort to ensure that they are eventually put into effect.[2]

These obstacles explain why energetic officials try to circumvent the system, perhaps by seeking presidential or ministerial backing to impose 'high priority' initiatives from above. This tactic succeeds in obtaining a quick response, but at the cost of isolating sponsors from having to accommodate to field constraints. It also cuts them off from negative feedback on programme performance (note the mistakes experienced by co-operatives in Zambia when implemented in this fashion, described in Quick 1977). Another ploy adopted unsuccessfully by Sudan, Tanzania, and Zambia in

2. Three excellent case studies illustrating these points are given by de Valk and Sibanda (1986) on Zimbabwe, and Good (1986) and de Jong and van Donge (1983) on Zambia.

the early 1970s and more successfully by Kenya in recent years has been to decentralise funding to the district level.[3] If the district administration can itself give approval to new initiatives on the spot, there is much better prospect for individual departments to act in a timely and effective manner.

(c) Personalismo[4]

The term 'personalismo' came into the international literature from Latin America, where it refers to the necessity when dealing with any bureaucratic matter of gaining the personal support of some senior official as the first step. North Americans and North Europeans are often uncomfortable with this approach to organisational transactions, which violates the formal division of tasks and leads to constant meddling from above in routine administrative matters. It is, however, a way of getting action which increases the apparent power of senior officials, allowing them to reward clansmen and to channel benefits to their own supporters.

It is a mistake to think of 'personalismo' simply as *corruption*. Essentially, it transforms routine administrative matters into an expression of patron-client relationships. To get action on any particular matter one must seek out a sufficiently influential 'patron' who will champion the request to ensure that it gets carried out. Obviously, it is only a small additional step to begin paying for such assistance, transforming 'personalismo' into outright bribery. While systems which depend upon 'personalismo' are easily corrupted, patron-client relationships occur in many systems and are not necessarily corrupt in the legal sense. Anywhere that resources are in very short supply, there will be an arbitrariness in deciding who gets what; senior officials practising 'personalismo' may feel that they are interjecting humane considerations by seeing that only the most needy people profit from distribution of benefits.

The effects of 'personalismo' are pervasive, but difficult to document. It affects many aspects of the field programme: whether an individual can make commitments which are binding upon his or her organisation; who controls the use of equipment on a day-to-day basis; who spends money, and which authorisations are

3. For analysis of this African decentralisation experience, see Rondinelli (1981a,b), Conyers (1981, 1983), and Cohen and Hook (1987).

4. Political scientists writing about Africa use the term 'patrimonialism' in much the same sense, see Crook (1988).

necessary; and whether one must obtain prior permission for travel or to change one's work schedule. If one's operational arrangements can be overturned without notice by a superior officer, and if the head of an organisation treats its resources as being under *personal* command, then obviously field cadres will see themselves as being only partly in control of their own activities. This, in turn, becomes a disincentive to their learning from mistakes.

Why does a personalised style of organisational control seem to emerge spontaneously within Third World administration? One explanation may be that managers feel they are forced to intervene by the circumstances of their job assignment. If, in addition, there are many field activities to be carried out by relatively untrained staff, the manager must supply many special skills directly. This means he will become too preoccupied to train his subordinates into more complex mid-management roles. Instead, the person at the 'hub' will divide complex jobs into simple tasks which are then handed out to a ring of subordinates, each of whom does only one or two things in a more complex process controlled by the manager directly. As long as the manager has a good grasp of detail and works energetically, quite remarkable results can be achieved. However, the co-ordinating and planning skills remain personal to the individual at the top; without the manager, the organisation is paralysed.

Field managers who adopt this approach can respond opportunistically to changing external events; however, their subordinates will become demoralised and ineffectual. Effective managers from such systems often complain that they are overworked and that bottom-level staff show low commitment to organisational goals. When the manager leaves, nobody from the field team will have the skills to step into the position (Moris 1976:422-4, 1977).

(d) Corruption

During the troubled 1970s and 1980s, few African regimes were able to avoid an increase in the apparent incidence of corruption. Outsiders often comment on this feature of African administration, and there is a growing literature on the topic.[5] What they mean by

5. General sources on African corruption are Andreski (1968), Ekpo (1979) and Williams (1987). Country cases include Gould (1977, 1980), Schatzberg (1988), and Gran (1983) on Zaire, Price (1978) on Ghana, Eker (1981) on Nigeria, and Wellings (1983) on Lesotho.

'corruption' encompasses an array of unofficial practices, some fairly unobjectionable but others clearly illegal. Those typically encountered in field administration include:

- private uses of official fuel, water and electricity
- purchase of produce or services at very low prices
- private use of government farms and facilities
- appointment of relatives and clansmen to government jobs
- use of official vehicles for private purposes
- diversion of heavy equipment to undertake private jobs
- shakedowns by police or the army at roadblocks
- bribes to obtain trading or movement permits
- selling off public assets to cronies at bargain prices
- giving contracts to shadow partners
- extra payments to clear items from arrival ports
- extra payments to obtain import/export approval
- percentage pay-offs by contractors on government projects.

Some of these practices are extremely common, though Central and West Africa show the more overt forms of corruption. The first five are so common as to be well-nigh universal, having become the expected way of doing business over much of Africa. As a country's economic situation worsens, the extent of openly manifested corruption tends to increase. Public servants may feel justified in capturing extra benefits because under escalating inflation their own salaries no longer cover normal living expenses. Various national disasters such as drought or civil war, overlaid upon an administrative system which is already characterised by 'personalismo' and the 'economy of affection', provide further opportunities.

Corruption when widespread affects agricultural extension services in complex ways. It enormously increases the effort required to carry out routine field activities, where timely access to transport, spare parts, and inputs is crucial to the achievement of official objectives. Up-country stations may find they can no longer make the official system work on their behalf, until they send their own representatives to the capital city or to the port to make the necessary pay-offs. Each station learns to hoard its spare parts, and to keep various commodities in stock for unofficial bartering with other agencies. Supervisors discover that inventory records mean little; when equipment is needed, it will be either broken or away doing some official's private jobs.

On the other hand, this situation appears quite different when seen from the perspective of those trapped within it. Agricultural staff often control tractors, water pumps, spare parts, and input supplies — all items in high local demand. Their stations contain surplus land, which can be given out for private farming. Government farms and experimental plots produce excellent commodities for barter or even outright sale. The agricultural office will have its own lorry or cinema van to be used as a taxi. Donors may contribute scarce, imported items like cassettes, cameras, and film, or just mimeograph ink — all readily sold for private gain.

The paradox is that the very features which make attainment of official goals so difficult at the same time offer gains to individuals which offset to some extent the hardships of agriculturally-related postings. If the system as a whole remains corrupt, to institute stringent controls upon agricultural staff may simply destroy the only incentives left which keep them in post.

(e) Tribalism

The pull of loyalties based on language, clanship or region might seem a holdover from Africa's colonial past. It was widely assumed that tribalism was a dying force; left unmentioned and unexamined, it would gradually disappear. Events during the past three decades in places as far apart as Zaire, Nigeria, Kenya, Sudan, Uganda, Ethiopia, Angola, Zimbabwe, Somalia, Chad, Mauritania, and now most recently — Liberia, show otherwise. Tribalism is in many localities as strong as it ever was traditionally. Social scientists tell us that modern tribal identifications have their roots in the language groupings employed for colonial administration (Goldthorpe 1984, Mazrui 1986). If so, it should not be surprising that people become more 'tribal' when they move out of their home areas — to distant places of work (such as the South African mines), to the shantytowns of the rapidly expanding cities, or into refugee camps. Tribalism flourishes when ethnic and clan affiliations are perceived as giving better access to school places, jobs, and favourable postings. In countries which have been subject to severe drought, civil war, population displacement, economic depression and accelerating urbanisation, these identifications remain important to individuals no matter how they are viewed officially.

We address here the narrower question of how tribalism influences the operation of field programmes, and thereby the choice between institutional options. Why, in particular, do African

officials so often admit that tribalism is a major problem while insisting it has no role within their own actions?

Those who hold civil service positions soon learn that tribal, clan and regional identifications constantly obtrude within the daily business of administration. Often there is a tacit policy to mix ethnic, clan and regional affiliations when making postings, or when recommending trainees for scholarships, selecting members for an investigatory or review body, or staffing a new section or district. It is frequently a policy to avoid posting staff members to work within their home districts. In some countries, even quite junior employees are typically outsiders brought in under national appointment. These practices are deliberately designed to keep employees from cultivating local attachments, an aim reinforced by frequent transfers of staff. They cause enormous problems within extension work, however, at both the district and community levels.

At the district level, those making decisions about agricultural assistance require a great deal of local experience and knowledge, on soil types and potentials, on diagnosing pest and disease outbreaks (which vary by crop and ecological zone), on monitoring trends by means of local indicators within and between seasons, on assessing likely responses from different communities based upon their past history, and on evaluating the potential performance of other agencies operating in the same area. These types of knowledge are site-specific. They explain why local experience is so important to farming success. To be effective, farm advisers must possess similar cognitive skills, acquired over an extended period of time and in the same or equivalent environments. When senior extension staff are rotated in and out of their districts, *they fail to acquire the crucial adaptive understanding which makes their technical knowledge locally effective.*

Contact staff are also greatly disadvantaged when posted to work with unfamiliar communities. In Africa, bottom-level extension agents often cannot speak the local language — making it nearly certain that they will fail to draw upon farmers' indigenous technical knowledge. Some are from urban backgrounds. Most hope somehow to get back into the urban areas where private jobs are concentrated and where advancement will be more rapid. In parts of the Sahel, there are additional religious or historic animosities, so that sometimes contact staff cannot even share food and water with their supposed clients. Here a major advantage enjoyed by commercial firms, co-operatives and NGOs is that these

organisations typically recruit personnel from the areas where they will work — the opposite of public agency policies. Developing and retaining good leadership is undoubtedly facilitated when those in charge are dealing with their own people.

Why, then, is 'tribalism' so often associated with misrule? The answer is undoubtedly that the same ties which assist co-ordination and advancement of one's own people can be used to exclude outsiders within a 'zero-sum' situation, what the anthropologist George Foster has termed 'the peasant view of the limited good' (Foster 1973). Where farmers are poor and opportunities scarce, those who help their own people are automatically excluding others. Throughout Africa, the elites who took power after Independence have continued to exploit this advantage — a stratification so distinct that French analysts have coined the term *encadrement* to describe it.

One sees evidence of *encadrement* on every side throughout Africa. Capable younger professionals are leaving the public service because they see their career prospects blocked by those of the older generation. Sometimes individuals are told quite openly that they are from the wrong group, and so cannot expect promotion. Ministers have been allowed to register companies in their relatives' names, and then to ensure that these businesses get a major share of the government's patronage. National leaders cling to power decade after decade. People from the President's clan, tribe or district have come to predominate within the ruling elite, holding the most powerful positions in the army, in business, and eventually even within the public service.

To answer our earlier question: these widespread tendencies cannot be openly discussed because they are very important, and because those inclined to exert such influence are fully aware they are acting illegitimately. It is no accident that the best analyses of African tribalism come from the pens of novelists, not from the continent's political analysts. Cronyism, clanism, regionalism, and tribalism — whatever we label these mutual support networks — have emerged to become the scourges of contemporary African administration.

(iii) Danger of systemic interlock

The term 'systemic interlock' has been proposed (Moris 1983b) to describe what can happen when problematic trends in a loosely coupled system become interactive and interlinked. These forces

then tend to support and reinforce each other. For example, a bureaucratic system which denies individuals the freedom to act in resolving their own problems, and which makes even routine administration time-consuming and burdensome, will also powerfully depress morale. Workers with low morale then show less willingness to provide the extra effort the formal system requires. Those who are effective will be forced to resort to unofficial channels, giving the appearance of tribalism and corruption even when acting from laudable motives. By using 'personalismo' to gain assistance, they activate patron-client ties to 'big men' within an increasingly moribund formal system. 'Personalismo' in turn reinforces and gives scope for tribalism and corruption. Multiplied in hundreds of seemingly unrelated transactions across a network of bureaucratic decision-making, these tendencies acquire a general momentum throughout the entire system. Field staff experience the result as an enormous difficulty in getting anything positive accomplished, but the causal factors themselves remain largely invisible.

Space does not permit a full defence of this admittedly controversial view (see Moris 1976, 1983b, and Moris et al. 1985). Let us simply note the negative forces which extension supervisors in Africa's poorer countries must struggle to overcome:

- high rates of inflation, frequent devaluations, and a general loss of confidence in the national currency
- low staff salaries (less than half a living wage), so that nearly everyone is engaged in private pursuits even when on official duty
- brain drain among senior professional staff, who seek external appointments in response to the difficulties they experience locally
- emergence of overt and self-sustaining corruption, with entire countries being supplied by parts, vehicles and inputs which move unofficially across national borders
- militarisation of the countryside, with civil war in eight countries
- donor projects come to supply virtually the only new equipment and transport coming into the system
- destruction of two decades' capital investment through under-utilised industrial capacity, poor maintenance, poverty and warfare
- re-emergence of locusts and virulent malaria, overtaken in some places by AIDS

- loss of key commodity markets to Asian and Latin American producers, while commodity prices remain generally low
- erosion of confidence in official institutions, with mass population movements across borders and widespread withdrawal of the 'uncaptured peasantry' from formal markets
- almost complete loss of legitimacy of post-Independence elites who nevertheless keep themselves in power by manipulating state power
- collapse of foreign assistance from major developed countries
- experience of multi-year droughts all around the periphery of Africa.

Obviously, people survive. Few countries have been forced to absorb all these negative impacts simultaneously; there are occasional success stories like the dramatic production increases in Zimbabwean smallholder farming. Elsewhere, Africa's peasants, and many of its civil servants, too, have retreated into semi-subsistence agriculture exchanged through the continent's vigorous parallel markets. Government agencies maintain a semblance of normal operation, but these days take effective action mainly when infused by outside capital from the smaller European nations where sympathy for Africa's plight remains strong. And, of course, African leaders get regular lectures from visiting economists telling them how to run their extension services (the T & V system), and what to do about parastatals, public employment, exchange rates, and market controls.

Whatever one's views about the causes of this distressing complex of external and internal 'shocks', it provides the economic and political context within which extension services must function. Extension planners and supervisors on their own have little ability to control the major sources of tension. In seeking to make agricultural services more effective, this highly constrained 'policy space' must be treated as a reality. The interventions proposed must be ones which extension agents can themselves put into practice. On this basic starting point most analysts can probably agree.

Both Leonard (1987a) and Wiggins (1988, 1989) stress that a certain minimum degree of administrative efficiency is a prerequisite for achieving most organisational goals. This issue is examined in Chapter 6, and again in Chapter 8 when reviewing the T & V system. My own observation is that in many countries Africa now has better trained field personnel in post than it can support

with salaries and transport. The effectiveness of human capital already created through past public investment is thus being destroyed by shortsighted measures to cut public service expenditure further. However, on the positive side this situation also means that the human resources to achieve much more *already exist*.

Unfortunately, once overlapping negative trends become interactive — in the sense that they are caused by locally independent but parallel pressures — their presence can render even quite dramatic policy reforms ineffectual. The situation becomes *dangerous* to a regime when incremental improvements cease to have sufficient leverage to counteract the negative momentum found within the larger system. These days, African governments make painful decisions carrying high political costs only to discover that the problematic features continue because people are responding to overlayered pressures which cause the same unwanted effects. Thus while African regimes got themselves into the present morass step by step, incrementally adopted improvements no longer suffice to get them out. Indeed, in my view externally imposed reforms have sometimes made the situation worse — at least insofar as the performance of extension services is concerned. Most economists would disagree; let us hope they are correct.

6
Management Essentials

This chapter will consider two distinct spheres where discretionary action by managers is required to achieve extension goals. A third will be treated in the following chapter.

(i) Inter-agency network co-ordination of support services

In regard to inter-organisational linkages, any one field agency has relatively little direct control over what other service units do. Co-ordinated action which involves several agencies thus requires much preparation and mutual bargaining. At the district level in present-day Africa, between twenty and thirty different agencies and departments contribute to an extension programme. The most common ones are listed below:

I

- rural water supply
- forestry
- irrigation
- veterinary services
- range development
- livestock marketing
- machinery services
- agricultural credit
- input suppliers
- co-operatives
- crop boards
- state farms
- land registration
- training institutions
- research institutes

II

- rural roads
- national planning
- environmental agencies
- rural energy
- general education
- national parks
- price controls
- central bank (imports)
- ministry of finance
- general adminstration
- community development
- local councils
- donors
- party leaders
- security forces

Of course, agricultural staff do not deal with all of these agencies every week. But even if we concentrate upon those adjunct services directly relevant to agricultural campaigns and projects (listed in column I), there are still more than ten separate functions to consider. In some countries, a large Ministry of Rural Development will encompass many of these technical functions; in others, each will come under a separate ministry or parastatal. In either case, though, one must go out of the extension division as such to obtain bureaucratic assistance. Hierarchical requests can be almost as hard to arrange as inter-ministerial ones, since the staff and resources needed do not come under a single section.

It would be difficult to over-emphasise the enormous tactical importance of having smooth inter-organisational linkages for achieving sustained agricultural development. Some types of field programme are *essentially* inter-organisational, where staff do not actually control the immediate resources they need for routine actions. Good examples include social forestry projects, where staff members from the forest department work directly with village committees and farmers; fish ponds for primary schools; on-farm adaptive field trials sponsored by crop research institutions but operated through the field hierarchy of extensionists; input loans funded by banks but administered through co-operatives or the extension service, and so forth. In Ethiopia, ILCA's attempt to develop a combined research and technology adaptation programme on vertisols found that eight interrelated institutions would need to be interlinked. For such programmes, inter-organisational management is essentially their own programme management.

Again and again in African crop development programmes, the failure of one or another service unit to deliver its agreed contribution on time and at site jeopardises overall programme success. Hybrid maize seed, for example, is of little use if the requested allocation of superphosphate fertiliser arrives weeks after farmers have planted their fields. Loan-financed fertiliser distribution will, for its part, leave farmers worse off if seed supplies fail or if extensionists supply the wrong varieties which prove vulnerable to local pests (an actual example from the mid-1970s in Arusha Region). The linear sequence of agricultural production activities means that the impact of poor linkages is cumulative. Individually, a 5% failure rate does not seem especially worrying, but cumulatively if there are ten or more steps in a linear production

process it can nevertheless mean a negative outcome in many seasons. For rural areas in Africa, one failure in every four attempts would probably represent a 'good' record of organisational service output, and in really remote areas perhaps every other attempt fails. Such lapses accumulate over the entire system to make the risk of institutional failure at least as important as natural risk in explaining poor yields experienced by farmers.

Livestock development programmes face especially severe strains in this regard. Either they deal with only one component in a mixed farming situation, and so must liaise with those responsible for crop extension, drug supplies, breed improvement, quarantine, etc. or they are concerned with extensive pastoralism where the crucial interventions relate to water supplies, roads, security, and the buying policies of distant slaughter houses. Effective rangeland development depends upon being able to exert leverage upon numerous environmental factors: access, stocking rates, the spatial distribution of water, control of fire, maintaining security, keeping down the costs of animal transport, and minimising death losses in adverse seasons. If, as in southern Africa, there is also the objective of keeping whole areas free of major livestock diseases (such as foot-and-mouth, whose incidence would rule out exports to developed countries), then the task itself becomes essentially interdepartmental.

To take two brief illustrations from the Maasai Project. On the demand side, while the Project operated some 60 cattle 'dips' it became apparent that over half were not functioning, most commonly because of a failure of the water supply. Without water, the 'dip' could not be kept in operation; without dipping, better breeding stock would die. But from a ministerial perspective it was not the livestock department's role to establish and maintain rural water supplies. Even when these had been provided when the dip was constructed, they would subsequently fail because they had not been incorporated into the Ministry of Water Development's own field programme. And, of course, in a dry environment any water supplies built would be used by the people for their own domestic needs irrespective of whatever government department did the construction or claimed to provide maintenance.

Another illustration relates to a road grader acquired through donor financing, justified as providing access for heavy equipment to work sites (14 dams in 2 years) and to construct roads within the large ranching associations (each about 200,000 ha in size).

However, once the equipment arrived it became clear that it was the only functioning road grader in the district, an area of 24,000 square miles. Irrespective of the project's needs, it was not politically feasible to deny the District's demands for shared access. The project's heavy equipment specialist insisted that only his own trained staff would operate the grader, on a cost reimbursable basis. This arrangement worked satisfactorily until a visit by the Tanzanian Vice President to a remote part of the project area was announced. The local Party bosses demanded the unit be kept in 24-hour operation to grade over 60 km of dirt track. When an untrained driver ran the grader without oil, both the Project and the District lost the use of the unit for the next six months until a replacement engine could be installed. Any large African field project will experience such pressures, no matter what agreements about equipment use have been reached on paper.

The routine operation of an agricultural extension programme generates many less dramatic examples. Tractors held on station, for example, will be under constant request; so also will lorries and buses. In general, African officials expect that transport will be shared so far as is practicable. The World Bank's T & V system assumes that institutions are willing to lend resource staff to conduct the training seminars. It also insists that the agriculture department lets other agencies carry out input distribution and credit supervision, and forbids staff to take part in agricultural censuses or in any other non-extension functions. How to keep water supplies in operation, whether for livestock or irrigation, is almost always problematic in rural Africa. Even the achievement of necessary linkages between crop and livestock extension can be difficult where these functions have been parcelled out to rival ministries.

Any activities which regularly require inter-agency co-ordination can be expected to become a source of managerial tension. As Chambers (1974) once noted, while many wish to co-ordinate, few are willing to be co-ordinated! There are several structural reasons for this. First, most common activities involve different specialties and professional disciplines. Here the expedient of putting the senior professional in charge breaks down, since professionals will differ in diagnosing the problem and in prescribing solutions. Second, the need for particular linkages between agencies is very much conditional upon their current programmes and will change as these programmes mature. Third, arrangements for joint action are often left until quite late in the planning cycle, being matters of

'implementation' rather than fundamental project purposes. Quite often related agencies are left completely in the dark about their anticipated contribution — a situation which almost guarantees a negative response. Fourth, those who must interact across organisational fences may be of quite different levels of seniority and attachment in the official structure. A young field agronomist may find it necessary to approach the Provincial Water Engineer or even the head of some national agency to obtain assistance. For all these reasons, then, the usual modes for hierarchical decision-making simply do not work well for managing inter-organisational co-ordination.

There is no proven institutional solution for this dilemma. *Major problems and continuing tensions always arise when agencies share their resources and staff within an interdepartmental programme of work,* however well it is organised. These tensions are exacerbated in poor countries where key resources such as transport or fuel are scarce, and where some agricultural staff are typically isolated at remote assignments. Of course, the least well endowed departments may be keen to establish such linkages. District political heads may strongly endorse a pooling of all departmental housing and transport, since they feel specialised agricultural agencies have more than their fair share. In Tanzania's Maasailand, for example, one of the first things which happened after decentralisation in the early 1970s was that the general administration took over the houses and facilities which the veterinary department had established at various isolated field locations. Genuine sharing on the basis of need is extremely difficult to arrive at because every department regards itself as being seriously below what it could properly require to carry out an effective field programme. Agriculturalists have the added disadvantage that because of the marked seasonality of their operations, there will be extended periods when equipment and facilities appear to lie idle.

In the immediate managerial context, these pressures push those in charge towards (a) a centralisation of control under the top official present (leading towards a distinctive mode of personalised management which generates its own problems); (b) an attempt to make the organisation self-sufficient, so that it runs all its own essential services (e.g. vehicle maintenance, fuel storage, electricity supply, construction, and so forth); (c) a proliferation of planning meetings designed to extract commitments from other bureaucratic

actors; and (d) various *ad hoc* exchanges of resources outside the official system (Hyden's 'economy of affection').

The high levels of uncertainty experienced by field managers foster an opportunistic style of day-by-day activity scheduling. Formal plans and agreed schedules become useless after only a few days, since there is always some new crisis coming from above which invalidates or overrides previous commitments. Unofficial exchanges of information become critical in order to anticipate what other officials may do and to lengthen the lead time in adjusting to events not under local control. One also learns to identify all key 'stakeholders' who have an interest in the outcome of a decision, and to lobby for their approval in advance.

These adjustments do not boost long-run systemic capability. In the short run, however, they enable the individual manager to cope. Here a brilliant conceptualisation of managerial environments put forward by a World Bank team provides a better way of looking at how programme managers ought to approach their task. Smith, Lethem and Thoolen (1980) contrast the situation they observed in the World Bank's construction projects, where most components are under managerial control, with that in rural development. They propose that three sets of factors impinging upon managerial choice be distinguished. Around the periphery are various 'appreciated' factors (like rainfall or the national exchange rate) which, while vital, cannot be controlled at all, and are only dealt with by better information, which permits a more relevant and speedy response. Next comes a smaller circle of 'influenceable' factors, such as contributions from other agencies or the support of community leadership; these can be obtained by persuasion, bargaining, and negotiation (but not by command). And, finally, there is a small core of directly controlled elements like transport or support staff.

Our problem arises because commercially derived managerial technologies focus upon this last sphere, taking it for granted that managers control most of the resources needed to accomplish tasks. On the contrary, we suggest here (in support of Smith, Lethem and Thoolen) that in agricultural extension field staff often control very little. Their whole approach needs to be adapted to discover what works within a 'loosely coupled' inter-agency service network — a task which neither civil service practice nor project management technologies address.

African countries have adopted several institutional innovations to facilitate the co-ordination of rural services used by farmers:

(a) Establishing a hierarchy of planning committees, to ensure that locational decisions about new investments are co-ordinated.
(b) Establishing Village, Ward, Divisional, and District interdepartmental Committees, often under the Prime Minister's or President's Office, for the purpose of making departmental staff more accountable to the territorial administration and to the people where they work. In some countries, these committees constitute Councils within a parallel structure for local government, and may contain elected councillors.
(c) A radical decentralisation of field services, by putting them under the territorial or local government administration, to which central government funds are channelled instead of being received in the Ministry of Agriculture's budget. This bypassing of the provincial and regional levels may leave them with relatively little to do.
(d) Creation of an over-arching 'integrated rural development project' (IRDP), often with external assistance, and linked to a given territory. IRDPs typically aim to involve poorer communities, to improve territorial co-ordination, and to ensure the inter-sectoral linkages necessary to make field services effective. Often, however, this is not achieved and the IRDP framework instead serves mainly to facilitate budgetary planning involving a major foreign donor.
(e) A grouping of all types of rural services under a single, super-Ministry of Rural Development, the implicit goal being to put all essential services under one bureaucratic umbrella and so in a position to be co-ordinated centrally.
(f) A vertical link-up of all essential services for a crop under its own parastatal or crop board (e.g. Kenya's KTDA and BAT).

None of these options has an unequivocally successful record. Several, such as radical decentralisation, IRDP programmes and multi-service super-ministries, have almost everywhere caused major difficulties for agricultural extensionists (whatever their general merits). Because the need for better functional co-ordination is so obvious, planners have frequently resorted to normative statements when proposing new structures: 'committees *will* co-ordinate...'. However, structural interventions within complex bureaucracies often produce counter-intuitive results. To offset improved performance in certain areas there are usually other costs, many of them unforeseen by the system designers.

What, then, can be recommended to improve liaison within a 'loosely coupled' inter-agency network? My own view is that of the above options (a) and (f) are the most promising. In almost all administrative systems, improved physical planning on an interdepartmental basis makes sense, and can be incorporated within the budgetary process as currently conducted. This is consistent with a mild degree of decentralisation, allowing departments to operate their own field programmes but bringing them together (perhaps quarterly) to review overall district needs. In regard to key export crops, a parastatal or commercial crop handling organisation can ensure better inter-service liaison *provided* great care is taken to ensure accountability and profitability. The many failures in Africa warn that crop authorities have their own problems, but the structure does offer advantages not provided by the other options.

Procedural interventions are also urgently needed to facilitate open exchange of information between field services and to speed bureaucratic responses when some crisis threatens. There is no excuse in the agricultural domain for prohibiting lateral communication across agency boundaries by field extension staff. Copies of correspondence to a supervisor should be enough to protect departmental interests.

(ii) Internal agency management

The second domain for managerial action concerns an agency's own staff and resources, and comes closest to the types of management discussed in textbooks. There are two views about how it should be achieved, indicated by the contrasting terms 'management' and 'administration'. Let us begin by examining these viewpoints, before going on to identify a somewhat different third approach.

(a) Rival concepts of organisational leadership

Unfortunately, while the two concepts overlap, they are not identical. Commercial leaders who tend to describe their role as being 'managers' work in a different environment from public officials, who tend to think of themselves as 'senior administrators'. Company managers must often deal with turbulent commercial environments. They set objectives, choose strategies, hire and fire staff, and in general try to adjust output to meet the organisation's short- and medium-term needs as measured in turnover and various output targets (return on capital, etc.).

Public agency managers, on the contrary, have less discretionary control over objectives, strategies, and staffing, but operate in a more stable institutional environment. They tend to employ a long-term perspective, and are typically less bound by immediate output targets. As a consequence, they see organisational reform as being a search for more efficient *routines*. While business and public affairs both employ complex bureaucratic organisations with similar formal structures, at the extremes the attitudes towards organisational leadership appear almost polar opposites.

Let us look first at the traditional concerns shared among senior administrators in public service agencies, since these are the organisations currently responsible for most agricultural extension within Africa. The reality experienced by senior staff in such organisations is that they must devote much effort to safeguarding 'bureaucratic hygiene'. Studies of African agency managers consistently find that senior staff devote a great deal of time to compensating for the incompetence of lower levels and finding solutions to routine difficulties (Wiggins 1988, 1989, Montgomery 1987, Leonard 1987a). Thus they tend to welcome proposals directed at reforming the efficiency of agency routines.

It should be clear from the discussion in Chapter 5 that the root problems of African management are not so easily resolved. One cannot deny the reality of the symptoms to which Africa's service managers are responding. But we need to recognise that the difficulties are often *symptoms* rather than causes. Dealing with the proximate problems by promoting better 'agricultural administration' is unlikely to be effective over the longer run, although it might produce a temporary boost in productivity.

This is the basic weakness in the viewpoint that Africa's service agencies could greatly improve their performance by tightening up on the controls exercised from above within each organisation. External analysts have tended to promote the classic remedies which might be employed in a developed country: more training, better job specification, participative decision-making, decentralisation, and clear accountability. Daniel Benor's T & V system represents one such approach (reviewed in Chapter 8). It assumes fundamentally that Africa's main problem is to strengthen the quality of its 'bureaucratic hygiene' (see also Dichter 1987).

Those who adopt a commercial management view define the functions of organisational leadership differently. To them, the task of those in charge is *coping with uncertainty*. This reflects the outward

orientation characteristic of successful business leaders, who must monitor prices, competitors' actions, market opportunities, transport and other costs, and even climatic factors. There are analysts who argue that the inward-looking, control orientation of classic public administration is a mistake, since it fails to address the more important external arena where discretionary attention will have the highest pay-off (see Stout 1980). From this perspective, agricultural staff in a highly uncertain environment have much to gain by being termed 'managers' rather than 'administrators'.

A further problem in regard to the concept of commercial management relates to the remedies recommended and the powers which managers are assumed to wield. Ultimately, the commercial model looks to the discipline of the market to counteract lethargy and unnecessary organisational growth. If field agencies must cover costs from user charges, they will obviously prune staff and expenses to levels which the local economy can support. In poorer African districts, however, this means that most services would be shut down (a point taken up in Chapter 8). Where production services can be privatised, as perhaps among Africa's veterinarians (see Leonard 1989), there are bound to be radical changes in how such units operate. This is because commercial managers exercise wide powers over their agency's internal resources: firing staff if prices fall, relocating personnel between divisions and functions, and setting stringent output targets. Such capabilities are the necessary counterpart which makes the 'discipline of the market' effective.

It seems (as outlined in Chapter 5) that agricultural managers experience some features of each system. They often find themselves reacting to external events resembling the situation seen in commercial management. However, they must do so within rigid institutional structures designed only to supply routine services.

I would argue that it is almost impossible to run an African farm or ranch at a profit under typical civil service constraints, where all revenue must be returned to the treasury, where the financial year may come to an end in the midst of each cropping season, and where paper qualifications rather than demonstrated skills determine employment. The crises which have multiplied in recent years simply increase the tensions engendered by a fundamental mismatch between tasks and existing institutional competences.

Extension managers occupy an in-between situation. They do not need to be quite as independent as farm or ranch managers, but

they must still respond to varying rural needs which change over each season and which differ from community to community and farm to farm. There are several distinctive features which strongly influence how extension management occurs:

- field offices often supervise staff located on isolated stations without adequate transport or communications of their own
- officers may be responsible for ordering, storing, and delivering various specialised inputs (seeds, fertilisers, spare parts, live animals, etc.)
- most stations operate their own mixed fleet of lorries, buses, Land Rovers, motorcycles, tractors and bicycles
- the workforce is sharply subdivided by rank, salary levels, and responsibilities so that achieving smooth teamwork becomes difficult
- staff are expected to make regular field visits into inaccessible areas and to keep in touch with clients who are themselves immobile
- there may be subsidiary enterprises (orchards, experiments, livestock demonstrations) to manage and protect
- some stations have linked training centres where residential courses and seminars must be organised.

It can happen, then, that senior staff in the larger extension offices spend much of their time trying to keep the vehicles running or supervising gangs of daily workers. Other stations lack these diversions, but offer few resources other than a locked room and a desk. Both in regard to task demands and the resources which field supervisors control, the situation in agricultural extension differs from what is assumed either in public administration or in commercial management.

(b) Using discretionary leverage

Organisational leadership, whether termed 'administration' or 'management', essentially involves getting people to accomplish organisational objectives while working within existing constraints. It must achieve an accommodation between organisational imperatives and individual needs. As we have seen, the effective manager energises other people to carry out organisational tasks. To do this, leaders typically exert *leverage* on the actions of those around them: defining options, identifying strategies, encouraging those who experience difficulty, supervising on-the-job

performance, and communicating a shared sense of organisational purpose.

When we say that leaders use discretionary leverage, we reaffirm the strategic aspects of management. Individuals in charge have a certain 'decision space' within which they are given the discretion to act. Those who are most effective realise, either by means of formal analysis or intuitively, which actions will have the most synergistic impact upon the functioning of the system. They look for points of leverage where fairly modest inputs from above will tap existing motivations and momentum in such a way as to facilitate high performance from all involved.[1] Sometimes (though rarely in my view) they achieve this by increasing the control they exercise over subordinates. More commonly, however, effective leaders are those who adopt a set of mutually congruent tactics giving mostly positive feedback to those within task groups.

Seen in this light managers can improve extension performance in four ways: they can relax the constraints by acquiring more resources (better facilities, more staff); they can modify the tasks to bring them into line with present resources and competences; or they can stimulate people to work more effectively by finding points of discretionary leverage within the existing system. Sometimes, in special cases, they may also change the system itself.

Existing attempts at extension reform (described in Chapter 8) tend to focus upon the first and last of these tactics, either bringing in donor assistance to augment local resources or changing the entire organisational structure. But such 'solutions' can be applied to relatively few field agencies. Most, instead, have disengaged from meeting genuine client demands while cultivating the appearance of a minimally acceptable level of activity — the bureaucratic 'stasis' described in Chapter 5. Genuine and sustainable improvements in performance will require finding ways to change incentives within field agencies subject to existing constraints.

Across Africa, field extension offices look pretty much the same. Most occupy several adjacent rooms, with the usual minimal equipment, and maybe a lock-up store with weighing scales and some cabinets. Staff will consist of two or three senior professionals, perhaps one with a diploma or degree and the others with specialised certificates, some typists, and a clutch of junior staff

1. The concept of managerial leverage is emphasised in Grove (1983), Chapter 3.

(cartographers, crop inspectors, census enumerators, drivers, messengers, and even a 'tea lady' or two). The available transport will typically include a four-wheel drive vehicle, perhaps a lorry, bus, or cinema van, some motorcycles and a few bicycles. Stations with a linked farm or orchard will have a tractor and water pump, and perhaps there is electricity and a fuel storage tank. All in all, however, this is a modest establishment which constitutes the raw material from which management must extract improved performance.

The next step is to identify the field supervisor's 'decision space': the precise places where there is room for discretionary actions to improve performance. The details will vary between organisations and between countries. In some systems, field managers hire their own junior staff; in others, all appointments must be processed through a manpower ministry or even by the ministry headquarters in the capital city. Nonetheless, field supervisors almost always have some input into the annual budget, to request new equipment and to operate existing facilities and services. They have varying degrees of control over staff recruitment and further training: usually total control over temporary or daily wage workers, some influence over appointment of first echelon 'contact workers' (if these hold their appointments in the district or province), and perhaps a little say in higher level recruitment. They generally have control over their own stations, office equipment, transport, stores, finances, farms, and field equipment. They usually decide the servicing schedule for vehicles, control vehicle movements, and allocate drivers to particular vehicles. They may also control who gets access to which vehicle — a seemingly minor matter, but one with major consequences for morale. In some systems, district staff also determine field postings: almost always for contact workers (the certificated assistant agricultural officers so widely found in Africa), and perhaps also for higher level professionals. (Specialists often have their postings dictated by linked facilities, such as a veterinary investigation centre or a training institute, and tend to operate autonomously.) Field supervisors typically compile annual personnel performance records, though the specific process and the degree of weight given to them differ. Supervisors usually approve leave, and must sanction official travel and absences from post.

These are in all fairly extensive powers, showing a distribution of discretionary control significantly different from the commercial textbook model. There will also be differences according to level

and nature of assignment — usually quite major differences depending upon seniority and position.

What should be emphasised here is the intent: those who design African extension systems need to search out the areas where discretionary actions will have a large impact but where officials at a given level also have freedom to act. In my experience, much of the international writing about extension says sensible things, but gives the kinds of advice that only a President or Minister can implement. For Africa's harried district level staff, our advice should concentrate on interventions which lie within their present decision space.

The following questions may indicate where interventions are feasible:

- Who recruits staff and determines their salary levels?
- Who posts staff once recruited? On what basis?
- How is on-the-job and further training provided?
- Who gets which transport? Is it adequate?
- Who allocates the recurrent budget?
- How are field allowances paid (if at all)?
- Are salaries paid on time?
- Which decisions are jointly taken?
- How much freedom do individuals enjoy to define their work programmes?
- Who allocates office space and resources? Are they adequate?
- Who allocates housing (or housing allowances)? Is it adequate?
- Who institutes disciplinary proceedings? On what basis?
- How is performance measured and rewarded?
- Who recommends for promotions? On what basis?
- Can staff be dismissed? For which offences?

7
Involving Farmers

Earlier chapters have shown that a key feature distinguishing extension work from other forms of professional agriculture is that in the first instance extension deals with people rather than with their crops and animals. Except in rare cases (e.g. in cotton stalk burning campaigns), the people dealt with do not come under the extension workers' direct orders. Here, as in the domains of 'extension management' considered in Chapter 6, civil service norms and project management procedures become counter-productive. Few actions are as likely to generate non-compliance and hostility as the issuing of orders to people who are not themselves agency employees.

An individual's effectiveness when working at the agency/farmer interface will depend upon the nature of the contact he or she establishes with potential clients. 'Managing' in this domain means finding ways to exert leverage on people whose participation and support must be won: through persuasion, obviously, but also through intellectual excitement, the conveyance of valued information, sociability, timely advice, facilities shared, services offered, and an array of further inducements which make it rewarding for clients and agency personnel to co-operate in achieving mutually desired objectives.

In describing the topic of this chapter as 'involving farmers', the point being made is that clients must desire the activities which an extension agency promotes. When they do, contacts across the interface between farmers and the agency become synergistic — they generate additional activity beyond that which the agency itself supports. This must be the goal for public services in a poor country. Otherwise the government's limited resources can be frittered away on various worthy activities which seem rewarding only to the agency's own managers and which have little lasting impact upon local development.

The issue of farmer involvement will be explored here in relation to four aspects.

(i) Is farmer involvement necessary?

The literature on rural development, and most government pronouncements, almost always take for granted the desirability of beneficiary participation. And yet, paradoxically, those carrying out official instructions at the local level often fail to see that farmer participation is necessary, or define this aspect in such a way that it means the exact opposite from what might be supposed. Let us begin by examining the reasons for this paradoxical situation.

(a) The agricultural officer syndrome

Virtually all African governments officially encourage local participation and initiative within field programmes, and yet, within African communities, there is much evidence at the local level that civil servants still rely upon the coercive methods of the colonial period.

To explain this we need to recognise what might be termed the 'agricultural officer syndrome', i.e. the similarities between this approach to dealing with farmers and the style of operations which field professionals often adopted in the later stages of colonial rule. This has several constituent features:

- a role model which sees agricultural professionals as 'officers'
- the idea that field staff mainly act to convey technical recommendations formulated by professionals
- a distrust of farmers' own indigenous technical knowledge
- a preference for arriving at uniform recommendations which can be promoted irrespective of local conditions
- a bias towards influencing farmers by issuing regulations and orders.

These notions are not necessarily irrational. They derive in part from a Western-oriented syllabus adopted in general education and reinforced in professional training, and are confirmed by an awareness that farmers often oppose what staff regard as valid scientific recommendations, thus leading to a categorisation of peasant farmers as being intrinsically 'conservative'. They are congruent with the widespread assumption among agricultural scientists that modern science is something new and superior to local practice. Even the giving of uniform technical recommendations seems more acceptable in circumstances where

civil servants feel unable to offer discretionary treatment to clients — either because this opens the door for corruption or because locally tested research recommendations do not exist.

In some settings coercive and regulatory methods appear cost-effective. Certain agricultural practices do not pay off unless all members of a community adopt them, e.g. quarantine restrictions, the dipping of cattle to remove ticks, or the weeding of irrigation canals. Foresters may regard a prohibition of tree cutting as the only way to safeguard drought-stressed riverine woodlands, e.g. along the rivers in Sahelian West Africa. The district administration may want to impose a blanket requirement that all households must plant cassava as a 'famine reserve', since it then becomes easier to identify violators. Indeed, district officials sometimes appear to hold the view that all households should bear the pain accompanying average solutions, which may suit few actual families but at least apply to everyone equally.

Nevertheless, serious longer-run negative impacts accompany an over-reliance upon regulatory and coercive measures, however well-intended.[1] If the prohibited activities (such as poaching or charcoal production) have a high pay-off, the attempt at imposing restrictions will simply drive the activity 'underground'. Officials allowed to resort to poorly tested, standard recommendations are freed from the necessity of searching for particular solutions to real needs. They will then continue to promote unpopular and inappropriate measures year after year, insulated by their own perception that they are endorsing 'modern agriculture' (in contrast to the supposedly 'primitive' and 'inefficient' existing practices). As the local farmers become more alienated, they cease to give programme planners feedback to indicate where and why things are going wrong. In a larger context where funds are scarce and officials almost immobile, a regulatory orientation leaves decision-makers cacooned in a self-defined world where they blame the low rates of service utilisation upon farmers' apparent apathy and 'conservatism'.

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1. For classic examples see Young and Fosbrooke (1960) on colonial terracing campaigns, Adams's (1981) review of government restrictions on a farmers' federation in Senegal, and Beckman's (1986) horrifying account of irrigation 'development' in Northern Nigeria. Moris (1973) and Liebenow (1971) analyse the colonial origins of the regulatory approach.

Because some regulatory duties remain for extension workers to carry out, extension planners need to recognise the possible impacts of role conflict. When field workers are asked to collect input loans, or to take other punitive actions which depend upon local knowledge, they cannot at the same time retain farmers' trust and co-operation. For example, some years ago it was found that in one particular community the Kenya Veterinary Department staff were detested. There had been a rather unsuccessful artificial insemination programme, not uncommon in Africa. In this case, however, a zealous senior official dictated that all local bulls should be castrated, so that farmers would have no choice but to use the insemination service. While the pregnancy rate remained low, the farmers became so agitated that the Department's field staff found they could no longer visit clients' farms.

Civil servants tend to see 'farmer participation' as a question of determining how clients can share the costs of the services provided, either monetarily (by making contributions) or at least through unpaid labour (as when irrigators keep water furrows maintained). Such contributions may well seem justifiable. Nevertheless, farmers may have quite different views. Often projects and services are sited without local involvement. A few wealthier farmers may monopolise the benefits being delivered. Farmers may prefer to grow different crops. The government's services might themselves fail to yield any genuine benefit because of blockages in other spheres or because delivery is haphazard and poorly organised. In Africa, we cannot plan for meaningful farmer participation until official programmes begin to deliver outputs which farmers genuinely want, and until field agencies find ways of working *with* farmers to address mutually recognised needs. In short, the extension agency must have an explicit strategy for contacting farmers and then for retaining their support.

(b) Lack of strategies for farmer contact

What other approaches beyond simply issuing orders do African agricultural agencies employ when dealing with clients? Numerous field visits in East Africa convince me of two things. First, while existing programmes employ many overlapping approaches to farmers, those in charge do not see these as *options* which compete for the allocation of time and resources. Second, the natural scientists whose views predominate in formulating Ministry of Agriculture programmes often target *crops* rather than people. There

is therefore a marked lack of strategic thinking about how outside agencies might involve farmers — though here the World Bank's 'training and visit' approach, with its stress upon 'contact farmers', is a partial exception (see below).

In Africa, field activities are often carried out season after season without *any* critical attention being given to the when, where, why and with whom issues. Agricultural extension has become something ministry staff do on a normative basis, promoting 'modern farming' in village meetings or by operating a cinema van. In the West African Sahel, the annual crop campaign has become the predominant approach, done automatically by 'functionaries' who see their task as the popularisation of scientific findings. Other staff find themselves assigned to rural training centres, and dutifully organise courses and seminars to fit whatever schedule the Principal or the Ministry lays down. Trainees are subjected to classroom lectures much like those given in secondary school science teaching.

This is not to disparage the motivation and efforts of field staff, who experience great difficulty these days in operating any formal programme. Instead, my point is that those doing extension fail to conceptualise their tasks in a manner which would allow critical and comparative analysis of their cost-effectiveness and local suitability. Senior staff may operate a rural training centre for years without giving serious thought to how trainees are selected, the instructional methods employed, or even the content of particular sessions. Those in field assignments almost always rely upon public meetings which are attended by older men and underemployed school leavers, while women continue to work unnoticed in the fields nearby. Such meetings, which in East Africa derive ultimately from the colonial *'baraza'*, have well understood rituals and conventions: a senior party politician or chief's representative opens the meeting, the ministry civil servant gives his or her speech, and then the audience claps politely. Attending such meetings is a sign of affluence and village solidarity. People do not expect to be asked significant questions. When questions are put to them, they usually wait to hear the politician's view first.

Consequently neither in the classroom nor in the field does genuine communication about technological matters occur. Currently 'extension' happens because all participants feel farm modernisation is in a nebulous way 'good' and because it is a task given to particular salaried occupations. Whether it is effective,

timely, or appropriate, and whether farmers become actively involved, are rarely examined.

At higher levels in Ministries of Agriculture, scientists in turn think of their programme as being the achievement of particular changes ('technical packages') in how given crops are grown, or simply the gross area planted to a given variety. What they fail to see is that this paradigm (what Chambers calls 'normal science') actually targets crops rather than people, and does so in a way which makes many presumptions about the supposed benefits farmers will enjoy if they follow recommendations (a point explored in Chapter 2). *How* farmers are selected, *who* decides on programme content, and *what* organisational context is employed are not explicitly considered.

Belloncle (1989) points out that the usual Ministry of Agriculture's 'top-down' approach to extension strategies is based on five erroneous assumptions, characteristic of the *vulgarisation* approach of much of francophone West Africa but prevalent elsewhere as well (Richards 1985, Chambers, Pacey and Thrupp, 1989):

- the need for close supervision
- the need for pilot farmers
- the need to compartmentalise technical recommendations
- the existence of the model farm
- the representativeness of adult males.

They derive from the basic premise that scientists possess an independently derived technical knowledge superior to that which farmers employ. When extension is seen as conveying this superior knowledge to relatively ignorant clients, there is no need for a two-way exchange of information and hence no pressure to search for better strategies for farmer involvement.

Adding 'contact farmers' (or 'pilot farmers' as they are called in the francophone tradition) to technology transfer does not necessarily imply a change in ministry attitudes. The World Bank's T & V system, for example, consists mainly of devices directed at improving downward communication within an extension service. Until the mid-1980s, T & V planners paid little attention to how 'contact farmers' were chosen or how they in turn related to their neighbours. It was assumed that the technological superiority of the research stations' recommendation 'packages' would be sufficient to stimulate their rapid diffusion once effectively communicated.[2]

2. Senior T & V experts would dispute this characterisation of their programme. See comments by V. Venkatesan, an extension specialist in the

Chapters 2 and 3 suggest instead several reasons why genuine farmer participation involving two-way communication is vital:

- researchers must understand farmers' varying production objectives before meaningful experiments can be designed
- farmers know the likely incidence of limiting conditions (or constraints) far better than outsiders
- the nature of farmers' needs changes as their farming practices and field units evolve
- repeated contacts between farmers and agency staff occur voluntarily only when each party values what they receive
- group action by farmers is unlikely until there is a shared understanding of both problem and solution.

(ii) Extension delivery components

Let us for the moment abandon the usual ways of describing 'extension methods' (meetings, farm visits, field demonstrations, etc.) to review instead how the whole process of service delivery might be conceptualised. A better grasp of the key components in this process is vital if we are to identify points where discretionary managerial action can improve output. Figure 7.1 sets out the various potential components under three headings: extension activities, activity contexts, and delivery agencies.

Difficulty in clarifying the nature of the extension task arises because the intermediate level of organisation, termed here simply 'activity context', is nebulous, variable over time, and (sometimes) non-exclusive. To define extension work simply by a listing of field activities is too reductionistic: describing what 'method' to use in an office visit, for example, is not very helpful. On the other hand, if we jump up to the typology of agencies in charge of service delivery, we find permanent bodies which are easily described (see Chapter 4) but which can act in various and overlapping ways. The essence of 'extension management' comes somewhere in between, and concerns how activities are grouped in time and space to achieve continuity, sequencing, and cumulative impact.

It is crucial for managerial purposes that we begin to conceptualise these activity contexts as options, different ways of approaching and involving farmers. Such options have characteristic strengths and weaknesses which are clearly evident from field visits; a settlement scheme is quite different from a field

World Bank's Nairobi office, 'Further Discussion of T & V Extension,' *Interpaks Interchange* 6(1):8.

office, which in turn differs from a growers' association. They constitute organisational nodes, linked to specific activities but having in most cases a continuing life and coherence of their own.

The importance of activity contexts is more clearly appreciated if we examine what happens when delivery agencies attempt to deal with farmers directly through various contact methods without any intermediary grouping of field activities. A tobacco authority might, for example, begin scheduling meetings with farmers and handing out inputs without creating any local body to provide these services apart from the authority's district office (as in central Tanzania). What district level staff rapidly discover is that such an approach quickly becomes inefficient once the numbers of participating communities and farmers begin to increase. There will be a lack of continuity at the local level, with fluctuating attendance at meetings and a general uncertainty about who has received what. The agency cannot establish an underlying sequence in its activities when communities enter and leave the programme at random and there is little carry-over from one meeting to the next. Tobacco growing is a demanding task which requires considerable skill. To meet the associated task demands the agency will be forced to interpose managerial devices such as a listing of growers, a selection system to screen individuals for input loans, field units to manage nurseries, and so forth. Willy-nilly, an intermediary organisation of field activities will emerge.

New agencies in an area often make the mistake of trying to sponsor local activities without the expense of establishing an intermediary organisation. They thus retain the maximum degree of control over what is done, and maximum flexibility in making changes as they see fit. But the service agency then discovers that its purported 'beneficiaries' show little commitment to the sponsored activities; they are simply the passive recipients, and so there will be nobody who feels responsible, nobody to repair structures or maintain equipment, and nobody to act if animals or plants need attention. While activities directly supported from a distance yield highly visible impacts, they also create a strong dependence which is antithetical to local sustainability. This is, I suggest, a major reason for many derelict schemes and projects one sees scattered around the African countryside.

At the other extreme, governments sometimes think it cheaper to unify *all* extension linkages under a single intermediary organisation such as the Party or perhaps the Community

Figure 7.1 Components of Extension Delivery

Development Department. Figure 7.1 does not adequately portray this umbrella approach to activity contexts, in which field staff (such as the *animateurs* of francophone Africa) are expected to link all members of their assigned community with the full range of external services. The appeal of this model is its simplicity, and the notion that since field cadres cannot be experts in very many subjects, perhaps they should serve simply as catalysts to connect farmers with relevant sources of external assistance.

It was the ineffectiveness of such a structure, established during the 1950s in much of India, which caused Benor to reject the inclusion of general and mobilising functions within the 'training and visit' system (pioneered in Turkey but further refined in India).

In Africa, too, giving a major extension role to the Party (as in Tanzania and Ethiopia) or to the Community Development Department has not been a success. It seems there is a necessary congruence between tasks, activity contexts, and support organisations (represented by the horizontal and diagonal lines in Figure 7.1).

The full array of contextual options (the ten alternatives in the middle column) require quite different competences. Most African countries use all the field contexts within service delivery. However, the supervisory and support linkages will be distributed over a wide array of delivery agencies (the institutional options reviewed in Chapter 4). Farmers and farm communities differ in their needs and attractiveness. A pluralistic situation where there are rival agencies with distinctive service networks is probably not inefficient and wasteful, despite its untidiness when compared with the highly standardised structures favoured by some planners.

(iii) The main activity contexts

An examination of the ten activity contexts identified in Figure 7.1 does suggest that they tend to cluster vertically. At the top, we find the approaches usually adopted by Ministries of Agriculture, which emphasise annual crop campaigns and the establishment of field offices. Next, within a fairly large cluster of commercially-oriented functions, we find alternative ways of crop handling, via co-operatives, crop authorities and commercial firms. All three tend to be vertically organised by crop, offering in sequence the full range of services which a high value 'cash crop' like coffee or tea requires. Yet another option is to group farmers (and their families) territorially into distinct schemes, e.g. to manage irrigation perimeters, settle refugees, or open up new lands. Then, in the lower part of Figure 7.1, come activities aimed to meet community needs or to cope with some pressing problem (like drought relief). Often these will be based upon a diagnostic survey, and will employ a project format coupled with establishment of a village committee. Finally, at the bottom, we find the course or workshop, a temporary and thus more autonomous activity offered by a parent training institute, perhaps in combination with any of the other agencies. On this basis our review of activity contexts can be reduced to five main alternatives.

(a) Seasonal campaigns

Seasonality is such an overwhelming constraint that it provides an obvious focus for the phasing of agricultural service activities. It is most extreme, of course, in the Sahel where farmers experience only one short 2-3 month growing season when the 'rains' finally arrive (Moris 1989b). Elsewhere, as in East Africa, there is a bimodal rainfall regime. In either case, farmers growing staple field crops (maize, sorghum, millet) find that the variable progression of the season imposes a clearly evident temporal structure on many farm activities. Service organisations must therefore anticipate farmers' needs, bringing in seeds and fertiliser before the rains begin, and then helping to monitor pest outbreaks as the season progresses. Particularly in the Sahel, the annual crop campaign has become the central feature governing how field offices approach the organisation of their extension activities. Staff working within an annual campaign should devote particular attention to programme planning: which communities to work in; how target groups are selected and recruited; measures to ensure involvement of women and seasonal workers (the latter particularly important in parts of West Africa and Sudan); and specific plans for other key enterprises such as livestock or irrigated vegetable gardening.

These planning issues are well covered in standard texts (Roling 1988, van den Ban and Hawkins 1988, and Moris 1981:75-78). To employ the concept of 'leverage' defended in Chapter 6, extension supervisors should examine more critically what farmers actually receive as a result of formal participation. Also, in systems characterised by such extreme seasonality, it is especially important that the agency's own assistance be rendered on time and in an appropriate form. The very worst outcome is when the agency delivers seed and inputs late, perhaps even attempting to recover input loans for supplies which yield no benefit whatever to farmers.

(b) Growers' organisations

Field workers may choose instead to deal with particular farmers over a longer period of time, typically either by registering them as recognised growers of a cash crop or by forming a growers' association or primary co-operative. Some sort of continuing contact with farmers based on their crop or predominant technology (as in water user groups for irrigation development) is very common in most parts of Africa. As already indicated, the three most likely

sources of organisational support are the co-operative movement (usually with a parent Ministry of Co-operatives or perhaps a national Co-operative Union); various crop authorities and boards (e.g. for rubber in West Africa or tea and tobacco in East Africa); or commercial commodity buying companies like the CFDT linked firms of francophone Africa or BAT in western Kenya. All have a predominant focus on handling the growers' crop, a vertical linkage of services which ensures that all essential forms of assistance are provided and usually paid for by deductions from the crop handled — an arrangement which solves the major problem of how to recover handling charges, always a concern with smallholders who must give priority to their subsistence needs and who are often short of cash to pay for particular inputs and services. Extension offered through growers' organisations or linked to the handling of a 'cash crop' tends to focus upon input supply, storage, buying and processing; it has a much more economic orientation than the traditional concerns of the ministry's general extension.

Paradoxically some of Africa's best and worst extension programmes are of this type. As a country's economic situation deteriorates, there is a particularly strong impact on crop handling services (which depend heavily on efficient transport, adequate finance, and honest administration). It is hardly surprising that farmers have stopped growing official crops like tea, cotton or tobacco when the linked extension organisations fail to pay them for the crop received. On the other hand, the internal weaknesses of these agencies have been exacerbated by the marked deterioration in transport, finance, and even security seen these days over much of rural Africa.

There is hardly any sensible advice in the literature to guide how poorly performing crop handling organisations can improve their output and services. The topics that must be addressed — transport economics, co-operative accounts, the operation of buying centres, etc. — are typically categorised as 'commercial', and thus left to the business sector. In Africa, however, extension offered through vertically organised crop handling institutions remains potentially important. For example, in eastern Kenya in the late 1960s co-operative society meetings were far more effective as a communication device than the Agriculture Department's own 'extension' meetings. Smallholders who participate in any single-channel marketing chain need a highly organised and efficient

purchasing organisation. Where such organisations exist (as they do in most of Africa) they should be assisted and used.

A fundamental issue remains, however: whether to attempt *group organisation* of growers, as in a primary co-operative society, a ranching association, or a water users' association. Advice on this question tends to reflect the analyst's normative beliefs about the desirability of common action as a framework for rural development. Those from within the tradition of 'dialogical extension' (à la Freire) see formation of local groups as a necessary first step in articulating an awareness of common needs. Others find that the organising costs can be excessive. I find Pollnac's (1981) review of where and when to organise fishermen's co-operatives very useful in indicating where group organisation will help.

(c) Schemes

Settlement schemes are generally recognised to be the most expensive way of involving farmers in official programmes, and yet they continue to be found within tropical Africa. By 'scheme' is meant here a territorial grouping of rural families, who may enjoy special assistance and services. Farm schemes were initially employed by colonial governments, as in the well documented Zande scheme of the 1950s (Reining 1966). After Independence, they were used to settle school leavers — a goal soon abandoned when it became clear how expensive the approach can become — and also for irrigation development and refugee resettlement. In Kenya and Zimbabwe, settlement schemes have been used to transfer large farms into smallholder ownership.

The approach has many peculiarities distinct from the other forms of agricultural development.[3] Schemes are bureaucratic creations, often involving many controls and aimed at achieving high yields. As a consequence, settlers become highly dependent upon the parent agency and tend to see themselves as government workers rather than farmers. Scheme managers get preoccupied creating the physical infrastructure (particularly within irrigation development). They often neglect the training and extension aspects of their task, relying instead upon coercion and plot licences to control farmers' activities. Perhaps this explains why very few settlement schemes

3. There is a large literature on land settlement. For an overview, see Chambers (1969), Moris and Chambers (1973), Palmer (1979), Oberai (1986) and Hulme (1987).

are ever handed over to the control of their members, a prominent initial objective.

(d) Community projects

The major organisational innovation for involving communities in rural development during the 1970s and 1980s was the introduction of the project format. When donors like the World Bank emphasise the need for adopting 'the project cycle' (Baum 1978), what they mean is that such investments should be carefully prepared so that the relationship of costs to benefits can be estimated and so that all involved know what is expected of them in advance.

The project cycle does seem an appropriate methodology for planning activities at a community level which may involve several organisations (village leaders, local government, a donor, and perhaps extension staff). In particular, NGOs often develop a concern for assisting specific communities. A continuing association of this kind gives field staff more flexibility in deciding what might be done — a decision which must grow out of protracted discussion with villagers themselves. Because the goal is simply to meet local needs, community organisers can choose between technologies and crops based on actual experience (a freedom not often extended to extension agents attached to a particular ministry or crop-handling organisation). Enjoying a long-term commitment, staff gain time for developing local support and stable project leadership; by adding project preparation to this commitment, the associated NGO (or other donor) acquires the ability to compare alternative investments as they are proposed. If a project is large enough to merit formal preparation, the external agency might fund a 'diagnostic workshop' bringing all interested parties together at site to explore what actions will be necessary — an activity akin to the 'sondeo' seminars described in Chapter 2.

There are quite serious problems with the project format when it is imposed as a planning device to guide all extension programmes, however.[4] Continuing services offered to farmers are hard to measure and evaluate as 'outputs'. Costs can be ascertained quite readily, but not benefits. Planners at a distance may try to control all elements of project design, without allowing for necessary

4. See critiques of the project cycle contained in Moris (1981:33-4), Honadle and Rosengard (1983), Rondinelli (1983:65-88), Johnson (1984) and Hoare and Crouch (1988).

changes as a project is implemented. The project cycle on its own does not ensure that anybody at the scene has the necessary managerial influence. It is, as Korten and others stress, merely a 'blueprint'.

Nevertheless, when the relevant situation being dealt with is a village needing some facility (such as a bridge) or a group of producers wanting to establish a coffee pulpery or an irrigation system, then use of the project cycle becomes justified. As an organisational framework, it ensures that there will be adequate advance preparation to see that the investment is economic; it also identifies the necessary participants. If they have agreed in advance on a budget and timetable, it becomes easier to monitor progress and to spot problems as they emerge. In fact, most large donors *insist* that field investments conform to their particular methods for project preparation. These days local leaders and extension staff have little choice but to employ the project approach whenever outside financing is required.

(e) Course/workshop

Our final activity context is one of the mainstays of traditional agricultural extension, the course or workshop. Considered from a local perspective, this will be a temporary activity when an external institution mounts a local training seminar, or when individuals from a locality go to some central facility to be trained. Courses, seminars and workshops are perennially popular. They provide a break from normal routines for participants. Quite often they are 'free' (if we ignore the organisers' costs). Participation requires only a temporary commitment. Course composition with respect to length, content, teachers and learners can be varied to suit the training purpose. Those attending can be given guided, 'hands-on' practice (rarely achieved in African institutions, however) and can receive intensive conceptual background information.

Earlier in my career I argued that these advantages merit giving farmer training more emphasis within African rural development (Moris 1967). I was probably wrong. What I failed to see was the overwhelming influence of the larger institutional context. Training does not occur in a vacuum. Those organising courses have clear-cut and quite traditional notions about what should be covered, who should do the teaching, and how class and seminar sessions should be conducted (see Chapter 4). If adult farmers are treated like school-children, it is hardly surprising that seminar sessions fail to

achieve effective two-way communication of information and skills. For most employees of Africa's many RTCs and FTCs, teaching is just another assigned duty.

Training can be ineffective even when it is imaginatively organised. I recall an interesting field workshop I attended on soil and water conservation in northern Tanzania. Funded by an outside donor, the course was given at a small forestry training facility, several excellent lecturers made a special effort to take trainees out into the field for practical demonstration of the main concepts being conveyed, the seminar participants came from different levels in the extension hierarchy, and the sessions were lively and covered the very latest scientific thinking on the topic. And yet, in retrospect, I realise this workshop was a failure. Those attending would have no continuing relationship once they left the course. Hardly any of them dealt directly with soil and water conservation or with producers in their daily work; most were, in fact, either administrators or mid-level specialists (teachers, planners, etc.). Once scattered through a dozen participating agencies, they would find little interest from their superiors for any initiatives they might propose. Furthermore, since this was an expensive, 'one-off' exercise there was no local organisation to convert the excellent slides and lecture notes for use elsewhere. It is ironic that a conventional training course offered to mid-level foresters on this same topic and at this same facility — if linked to teachers and institutional support — might have achieved more lasting impact.

This example illustrates the reality that courses, workshops and seminars require a large invisible organisational input to be effective. Those attending (whether teachers or learners) must be carefully selected. On-site field demonstrations take a major effort to arrange, and require logistical support (in the form of transport and local extension contact). The materials used can be expensive to produce — a main reason for co-operation between centres (rather than doing 'one-off' workshops) and for evolving a set of instructional materials gradually unit by unit. There needs to be advance diagnosis of trainees' needs, and follow-up analysis of training effectiveness. The activities provided should reinforce each other while avoiding fatigue and boredom. All in all, even a low-level 'field' workshop requires careful and extended preparation.

These are all obvious points. I make them to underline the danger that when training institutions are put under stringent budgetary

limits, their staff will tend to economise on the invisible preparatory aspects *which are the very features which make training sessions effective.* The Ministry will cease to purchase adequate technical materials to support trainers; institutional support in the form of curriculum workshops and staff exchanges ceases; allowances are no longer paid, and external 'subject matter specialists' stop attending; and the institution itself withdraws into a skeletal programme offering a few highly stereotyped courses.

Thus in conceptualising 'activity contexts' we must start to think critically about traditional field extension activities. Who attends them? Who prepares the content? What information is exchanged? How is it adapted to local contexts? What incentive is there for participants to speak out or to make necessary corrections to the message? Are they empowered to act in this domain subsequently? By asking such questions, one hopes to break through the presumption that all forms of extension are 'good' so long as they concern modern agriculture. In truth, the performance of extension rituals by poorly motivated field staff is largely ineffective these days: it is time we learned the reason for this.

(iv) Reconceptualising extension functions

Partly our problem in clarifying how farmers might be involved arises from visualising 'extension' only in relation to technology development. Even the broad definition of extension functions given in Chapter 1 related these various activities mainly to the technology development process. Since farmers as individuals are usually not the originators of entire technologies, any technologically-grounded definition of extension will tend to give the initiative to other parties, either to research scientists or perhaps to agri-business entrepreneurs. Farmers and their families remain ultimately *recipients.*

Farmer participation comes to the forefront, however, as soon as we recognise other ways of viewing extension functions. If we ask instead what outsiders can be expected to *do* for and with farmers, we quickly find additional functions not primarily related to technology (Roling 1988, Shingi 1983.) These might be:

- crop handling
- problem diagnosis
- problem solving
- transfer of skills
- farm planning

- resource assessment
- opportunity identification
- mobilising common action
- crisis warning
- linking to external services/expertise
- local empowerment.

It has become fashionable among some advisers to brush aside these broader functions of extension, as if they can be left to other organisations or are for some mysterious reason not so valuable to farmers as technology transfer itself. Benor, in particular, has been adamant that agricultural extension should not address tasks other than the promotion of technological innovation (Benor and Baxter 1984). If the extension service cannot deliver its currently targeted outputs, any broadening of functions to include other tasks — such as group organisation, input delivery, or crisis response — will simply raise expectations without increasing organisational capacity.

The rival viewpoint stresses the limited role of technology transfer in solving Africa's long-run rural development problems. At a local level, farmers already possess many skills which they fail to employ in addressing local problems. They experience major problems, such as drought or a collapse of commodity prices, about which technology transfer remains silent. These days farmers are very sceptical about the efficacy of government services, and about the promises which politicians or military governors continue to make (see Chapter 5). At the same time, they feel unable to act on their own even when the materials and competences lie close at hand. Outsiders see expensive facilities going to ruin without maintenance or any local support, while farmers wait passively for a new round of outside investment to 'solve' their problems. A Peace Corps rice breeder from Sierra Leone relates an incident typifying this attitude:

> One morning I was surprised to see that our villagers were finally repairing the one bridge connecting them to the outside world. Then, looking more closely, I found they were instead tearing up the remaining planks to take to their homes. When asked why, they replied that an important FAO team was scheduled to visit the following week. Now, surely, the Government would come to repair their bridge. And, yes, the Government did.

Critics of orthodox extension like Paulo Freire and Ivan Illich stress that the technology transfer approach embodies a 'banking'

concept of knowledge. People are thought to accumulate skills and information in a static fashion, without mobilising these inputs to resolve actual problems. Freire argues in contrast that the first precondition for change is for people to develop concepts which relate to their *own* conditions. Outsiders in this sense can never *solve* problems for local farmers; the original problems will simply reappear at a later date. Genuine problem-solving depends upon people coming to understand their situation (the cognitive or symbolic aspect) and then showing a willingness to act in making things better (what Marxists call *praxis*). Lasting rural development only occurs when extension becomes part of a process for taking joint action; if left unexercised, the capacity itself dies.

Freire terms this process 'problematising', to distinguish it from 'problem-solving' done by experts *for* people but not *with* them. It grows out of complex and extended interactions, in which outsiders serve simply as catalysts to encourage intercommunication between those experiencing a problem as they grope towards more effective modes of analysis and response. People must become the 'subjects' of their own history, rather than the 'objects' of external analysis. Freire's 'dialogical extension' (as his approach has come to be called) is thus more akin to 'empowerment' than to conventional technology transfer (Freire, 1973: 85-162 and 1972).

These are heady notions, which address a major gap within orthodox conceptualisation of rural development. There is clearly something wrong when people wait patiently for an impoverished government to come and solve their problems. It is also true that orthodox extension fails to create sustainable local capacities and to change farmers' own definitions of the 'decision space' within which they are willing to act. Trust, a willingness to take risks, and group support are not addressed within the technology transfer perspective.

On the other hand, on its own group organisation is also insufficient. Not all problems require group action. Proponents of 'dialogical extension' fail to recognise the substantial organising costs which holding meetings can entail; and in any case African male heads of household seldom take such discussions seriously. 'Dialogical extension' can easily become just as formal and ineffective as the approaches it seeks to replace. My own view is that the Chinese slogan 'we must walk with two legs' gets the balance right: there is need *both* for high pay-off technologies (to

drive the diffusion of innovations) and for empowerment to create sustainable local actions. Either approach, on its own, is fundamentally unbalanced and will not yield long-term development.

8
Extension Reform

A major change in the 1980s within the international system was a growing recognition that Africa is the world's 'problem continent'.[1] This has made it easier for outsiders to demand sweeping reforms, which are considered in this chapter. First, however, it is helpful to examine earlier suggestions African governments have received and acted upon (some of them now blamed for Africa's disappointing performance).

Early post-independence initiatives

Most of Africa emerged from colonial domination in the 1960s and 1970s, in an impoverished setting where many of the agencies and services usually associated with national development had to be created, sometimes from scratch. Thus, as noted in Chapter 1, the first decade after Independence was almost universally taken up with institution-building, much of it financed by grants from donors vying to assist newly independent nations. A large number of public and parastatal agencies — research institutes, commodity boards, agricultural colleges, co-operative colleges, survey organisations, audio-visual centres, institutes of public administration, and even completely new universities — were established, in 'boomtime' conditions which meant that senior staff were freed from securing a local financial base to support the infrastructure being created. The triple goals of Africanisation, institution building, and

1. The classic article which alerted the international community to Africa's food crisis was by Eicher (1982), whose MSU programme has generated much of the data on African agricultural economics. There is now a large literature on the 'African problem', including Berry (1984), Cohen (1988), Commins et al. (1986), Hansen and McMillan (1986), Gakou (1987), FAO (1986a), Moris (1983a), Rimmer (1988), Wheeler (1984), and a series of major World Bank policy documents beginning with its 'Berg' report (1981).

modernisation sufficed to justify almost any specialised facility which a donor might agree to build.

As a consequence, reforms adopted in those early years did not address issues of institutional sustainability. Instead, outside advisers assisted ministry staff in drawing up curricula for agricultural colleges, in establishing agricultural information centres (as in Kenya and Uganda in the 1960s), and in rationalising career structures for newly trained extension staff. Senior ministry staff were involved in manpower planning, drawing up terms of service for new professional specialties, staffing and equipping training institutes, adding agricultural science as a subject in general education, and teaching field staff how to conduct on-site farm demonstrations. In East Africa, at least, the *content* of extension came largely from technologies for maize, coffee, and tea production already developed and tested in the immigrant large-farming sector. Commercial firms (like BAT in East Africa or the CFDT companies in West Africa) were equally involved in devising systems for 'close supervision' of officially sponsored smallholder farming (Ruthenberg 1977).

Thus the major rural development initiatives in the early 1970s aimed at further improvements to institutional infrastructure, such as creating cash crop authorities or establishing integrated rural development programmes. External donors were the ones pushing African regimes to create these rural service institutions with their complex organisational structures and numerous salaried staff. The 'engine' driving the system was thought to be better input packages associated with high value cash crops, whose increased exports would pay for the concessional loans being offered. There is no record of African leaders' own views about these ambitious plans; what can be said is that donors got their way and countries like Malawi, Tanzania and Ethiopia became deeply involved in a series of major loan-financed rural development programmes. Increasingly, the World Bank took over the leadership role earlier exercised by bilateral donors like USAID (in the 1960s) and the various Scandinavian nations (in the 1970s). Indeed, the major text on African rural development became Lele's (1975) book which gave prominence to the World Bank's Malawi and Ethiopian IRD programmes.

A major fallacy of the time was the presupposition that having the right *model* guaranteed rural development success (Moris 1983b). With the benefit of hindsight, we can see that choosing an

institutional model is only one step in a longer sequence. The special circumstances, long gestation, and committed leadership which the KTDA enjoyed (Lamb and Muller 1982, Leonard 1988) were not found in Africa's other cash crop authorities and these have subsequently foundered (as we saw in Chapter 4). When an author like Blume (1971) lays out various African organisational structures, the outline, while sufficient to make financial estimates, is quite insufficient to guarantee subsequent success. East African countries were still in the stage of 'shaking down' their many new parastatal institutions in the 1970s when donor support abruptly shifted to 'basic needs' and IRDPs. The latter institutions were themselves copies of models from India, and in fact performed no better than the still struggling cash crop authorities or the marketing co-operatives before them. Again and again it has been donors who suggest and fund Africa's institutional innovations. It is sometimes forgotten that even Nyerere's much criticized Ujaama villages followed from suggestions by a World Bank mission shortly after independence that Tanzania *should* adopt a 'transformation' approach (Moris et al. 1985).

The rush to build donor-assisted new institutions created 'boomtime' conditions, when promotions were frequent and nobody worried very much about loan repayment. Indeed, the World Bank's analyses focused instead upon economic appraisal; those urging new projects on African countries paid scant attention either to recurrent cost implications or to the sheer inability of many governments to raise public revenues from their peasant farmers (leading Hyden to characterise them as the 'uncaptured peasantry'). Thus when the downturn came in the later 1970s, political leaders were caught unprepared. They were taking on major development loans which assumed favourable product prices and a recovery of costs from producers, and they had just created an elaborate institutional infrastructure staffed by administrators for whom cost was not a concern. Outside analysts these days express outrage at African excesses, but we might note that the IMF and World Bank's approbation is misplaced. The Bank itself promoted the very projects which are now no longer viable, and did so on the basis of faulty agronomic projections and almost non-existent institutional analysis. Furthermore, research by Wheeler on the sources of economic stagnation in sub-Saharan Africa finds 'an extremely close relationship between movements in export prices and average performance throughout the 20-year period' (1984:1).

Agricultural extension, meanwhile, languished. After USAID's earlier promotion of result demonstrations, technical packages, and agricultural information, the whole discipline fell from favour.[2] Ministries of Agriculture lost their best technical staff, first to crop authorities and then to IDRPs. New donor-assisted programmes became the only source of transport and equipment, as African treasuries increasingly became bankrupt and national regimes began to operate with only a few days' foreign-exchange earnings in hand.

At precisely this juncture both USAID and the World Bank reappeared with new programmes which did fall within MOA jurisdiction: farming systems research (FSR) within USAID, and Daniel Benor's 'training and visit' (T & V) extension system within the World Bank. The two emphases should have been directly linked, since FSR deals mainly with technology derivation while T & V concerns technology conveyance to clients — but they were not. We shall therefore examine them as separate and rival approaches here and review the East African experience from the late 1970s. Both have had a different history in West Africa (see Matlon 1984 and Roberts 1989), but the basic lessons from East Africa probably apply in West Africa as well.

Farming systems research

The perspective now known as farming systems research (FSR) had three major originators in Africa. Ruthenberg, a German, was among the first (along with Eric Clayton in Kenya) to see that East African smallholder farming could be analysed using conventional farm management techniques already employed in developed countries, but also that these farming traditions had distinctive economic traits which must be taken into account when formulating development policies (1968). He then went on to describe tropical farming systems worldwide (Ruthenberg 1980). Collinson, employed at Ukiriguru in Tanzania on cotton growing research, followed with his own account of the Sukuma farming system and with a methodological defence of single-visit farm surveys (1972). At Zaria in Northern Nigeria, Norman was meanwhile working

2. I recall in the mid-1970s when USAID would not even permit the extension label when we were asking for an extra specialist in Tanzania's Massai Project: the post had to be called an 'agricultural information specialist' instead.

with a team of researchers to analyse Hausa farming (presented initially in several Nigerian reports and internationally in Norman, Simmons and Hays 1982). Thus work from within what would be called today a 'farming systems perspective' had its own separate roots in Africa outside the CGIAR system and paralleling similar developments in Latin America and Asia (led by Hildebrand and Barker, among others).[3]

If we contrast FSR with earlier agronomic research (described by Belshaw and Hall 1972), it shows at least four differences (Norman 1982):

- it is based on a comprehensive view of the farm as a whole
- priorities for research should reflect whole-farm analysis
- components' research must take into account connections with other sub-systems
- evaluation of research takes into account linkages between sub-systems.

Norman also delineates four stages in its 'downstream' application:

- a descriptive and diagnostic stage, looking at the total context
- the design of intervention strategies based on prior diagnosis
- field testing of proposed intervention strategies
- extension based on those measures which perform well under on-farm screening.

Thus viewed, FSR provides a methodology for choosing which problems to study and for ensuring the on-farm testing of the recommendations which result. More broadly, a 'farming systems perspective' has several general features which are a decided improvement on the earlier tradition of discipline based on natural science research. With minor differences, most proponents of FSR would see it as:

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3. Perhaps this explains the unfortunate controversies in the early 1980s over method and labels once FSR had become fashionable. Several MSU papers (Gilbert et al. 1980, Norman 1979) coincided with USAID backing for FSR. USAID commissioned a major FSR handbook (Shaner et al. 1982), as did CIMMYT in Mexico (Byerlee et al. 1980), and eventually the World Bank (Simmonds 1984). Those in the CGIAR system preferred the term 'on farm research' (OFR), while those in England talked about 'adaptive research' (in contradistinction to 'applied research'), and both Hildebrand and Collinson referred to a 'farming systems perspective.' Among the many acronyms proposed have been FSR & D (Shaner), FSIP and FSR/E (Hildebrand), OFR with FSP (CIMMYT), OFCOR (ISNAR).

- seeking to identify and address farmers' constraints
- using extensive surveys and rapid rural appraisal to pinpoint areas for more intensive scrutiny
- employing all relevant disciplines
- involving farmers to highlight problems and screen technologies
- framing recommendations with regard to the domains where they are applicable.

Perhaps the most basic divergence from practice in technical research is that in FSR the topics to be studied are derived from prior analysis of client needs and environment, not from disciplinary concerns. It is assumed that no single set of extension recommendations will apply to all farmers. A principal reason for doing FSR is therefore to identify which are the significant types of farmers (ecologically, economically and socially), whose production objectives, practices, and constraints differ and so require differing technical packages.

Definitional problems have been significant within FSR. Although the twin goals of having a whole-farm evaluative perspective and showing relationships to larger systems seem straightforward, *nobody knew how to achieve these goals in a parsimonious fashion.* For his Tanzanian system case studies, Ruthenberg (1968) positioned PhD students in each area — hardly a generally replicable procedure. ILCA, the one CGIAR institution with a strong (though now attenuated) commitment to systems research in its charter, resorted to huge team studies which took years to complete and never did pinpoint where ILCA's field research should be directed (Greyseels et al. 1986). The enormous volume of applied research done on Sukumaland in Tanzania and Hausaland in Nigeria was not encouraging, either.

Consequently, the regional training programme for FSR set up at Nairobi under Collinson (from 1976 onwards) adopted the CIMMYT farming systems approach already developed to inject farm economic screening into CIMMYT's primarily Latin American programmes (Sutherland 1987). Though Collinson has consistently championed a broad view of FSR, CIMMYT's own methodology (exemplified in their 1976 manual by Perrin et al.) used marginal analysis of incremental benefits to *avoid* doing a full analysis of systemic contexts. While CIMMYT claims its procedures represent 'on-farm research using a systems perspective' (OFR/FSP), its own mandate is for component research of the conventional kind. Sutherland is correct in stating that the CIMMYT training materials

used to introduce FSR throughout East and Southern Africa essentially focused on farm economics. Conspicuously missing from CIMMYT's materials have been the behavioural social sciences such as anthropology, sociology, political science or public administration.[4] Collinson broadened CIMMYT's disciplinary focus by insisting upon preliminary diagnostic surveys done in each country, and by employing some aspects of rapid rural appraisal (Collinson 1988).

Collinson (1988) has given a frank description of his East and Southern African experience, of the kind most experts hesitate to put into print. He notes:

- the low priority given to professional and technical interests in comparison with political imperatives
- the heavily top-down orientation of many African development institutions
- a tendency towards paternalism among professionals when looking at peasant agriculture
- poor rewards given to research and extension staff
- poor management of technical assistance project staff
- failure of field teams to have all staff in post at the same time
- the lack of any sustained career pattern for socio-economists
- the need for the 'long view' when attempting to make institutional changes.

As an observer and participant in some of these activities, I would reinforce several of Collinson's central points. First, that, as he admits, 'money talks': CIMMYT, with only training on offer, stood little chance in competition with the World Bank, which could bring $20 million projects and a fresh infusion of vehicles and foreign exchange to those adopting its T & V extension system. A second point, not fully recognised by Collinson, is the danger when using zonal teams (as CIMMYT has tended to do in each country) that they will quickly become marginalised within the strongly hierarchical research and extension services where most important decisions are made nationally. As a consequence, the preferences of particular individuals in charge of each country's research services have exerted a huge influence over programme success. A third point is the deteriorating institutional situation seen in much

4. As explained by Sutherland (1987), in much of Africa anthropology is taught as part of sociology, although some of Africa's leading socio-economists have been anthropologists.

of Africa during the late 1970s, just when FSR was struggling to gain acceptance.

For example, Collinson points out that research services which had once employed outstanding economists now had none at all (Ethiopia and Tanzania being the two exceptions). The East African Economics Society died, and Makerere's excellent *Eastern Africa Journal of Rural Development* ceased publication. By 1984, while ten of Kenya's twelve FSR trainees had completed master's degrees, not one remained in the Ministry's Scientific Research Division under a hostile Director. Rapid staff turnover, a loss of senior Africans to international employment, a falling off of donor interest in agricultural research, and the low priority accorded it within national systems had a cumulative and strongly negative effect. Collinson's depiction of the national institutional situation is virtually a summary of the trends reviewed in Chapter 5, referring to countries even poorer than those he dealt with. He says (1988:13-14):

> Low morale and weak motivation are compounded in some countries by mismanagement, and corruption... In perhaps half the countries of the region there is no way researchers can live off their official salaries. Farming, business and less frequently graft supplement family incomes. Morale is low and professionalism eroded.

Even so, for a time FSR seemed the only option for those trying to revitalise African research services, just as T & V became the only choice in improving extension delivery. By the early 1980s USAID, the World Bank, IFAD, IDRC, ODA, the Netherlands, SIDA, and FAO were all funding FSR projects. USAID alone had eleven bilateral FSR projects in East and Southern Africa (Collinson 1988:14). But this prominence became a disability when FSR fell from USAID's favour.

FSR's rapid loss of USAID's confidence is partly a consequence of unreasonably high expectations, and partly of the fact that among donors USAID has a very short attention span. It also happened, however, for reasons Collinson admits. The flush of funding available in the late 1970s meant that many American universities rushed onto the African scene, without prior experience either in the region or with FSR. Staff nearing retirement and no longer essential at home were sent off to work in Africa on ambitious projects for which there was no agreed methodology. They tended, as had ILCA and IITA before them, to divide problems along

disciplinary lines but to carry out the experiments on farmers' fields rather than on-station. As an approach, this was a disastrous compromise. It yielded flawed data gathered at great expense by people who had no clear idea what questions to ask. The conclusion reached by Lightfoot and Barker (1988:15) based on a survey of 41 practitioners aptly describes the FSR experience with formal, on-farm experiments:

> Responses suggest that projects based on formal, complex, researcher-designed experiments ran into a maze of problems including logistical support, analytical needs, interdisciplinary compromise, and farmer participation. Most importantly, this conventional approach to farming systems research fails to incorporate the experiential knowledge of the farmer in the research design.

T & V Extension

Daniel Benor's 'training and visit' (T & V) extension system was brought to Africa in the early 1980s, shortly after FSR had arrived, having achieved substantial success under World Bank sponsorship in Asia (particularly India) during the late 1970s. Benor himself had earlier worked in Turkey, and is a former director of the Israeli extension service (Roberts 1989). He brought to the promotion of T & V substantial Asian experience, tremendous energy, and a familiarity with Third World officials at the highest levels.[5] The system he promotes with full World Bank support embodies a return to classic principles of management, emphasising (Benor and Baxter 1984):

- functional unity — extension should only concern itself with one high priority task, bringing better technologies to farmers
- a clear line of command, with no individual directly supervising more than about eight subordinates
- an agreed message for each time period over the season, conveyed to 'subject matter specialists' (SMS) in a monthly 2-day meeting and by them in fortnightly training sessions to field extension workers
- set fortnightly visits of field workers to specific 'contact farmers' representing their community

5. Benor's influence is illustrated by his ability to get a two page, favourable review of his introduction of T & V into Kenya in the *Economist* (5 July 1986) under the title, 'What Africa can learn from India'.

- demonstration plots grown by farmers themselves used to convey messages to farmers' neighbours
- two-way communication from farmers to extensionists to research and back, highlighting and answering any emergent problems
- a parallel system of monitoring and evaluation, so that field agents do not need to file written reports other than their work diaries.

If one reads the World Bank's T & V manual (Benor and Baxter 1984), one cannot miss its prescriptive comments and the normative tenor of its advice:

- leadership of the extension service must be strong, active, innovative, and field-oriented (p.6)
- extension staff must keep in close touch with relevant scientific developments and research (p.9)
- field visits are undertaken by all extension workers (p.51)
- participants (at SMS training) will be both from the extension service and from universities and research agencies (p.63)
- the extension service should ensure that full, appropriate use... is made of the teaching support available at farmer training centres (p.148)
- the collection and dissemination of relevant information should be carefully planned, implemented, and monitored (p.153).

As they stand, such statements are unexceptionable: they articulate goals which many of us have been trying to achieve in Africa for many years.

For African users of T & V, the question arises again and again: *how* does a service create a given capability required by T & V, and *who* pays the bills? One is told that T & V is a self-contained package of organisational innovations, which must be adopted as a unit in order for the system to be fully effective. Benor and Baxter also say (p.6) T & V is designed to achieve results 'at as little cost as possible' through re-employment of existing staff. Then, as a programme gets under way, African adopters of T & V soon discover the 'upstream' demands implicit within the system. As described, T & V requires a regular output from the research system of technical recommendations which are relevant to farmers' needs. It needs a monitoring and evaluation unit, institutions willing to lend experts to act as resource personnel, trainers for the monthly 2-day seminars, an effective input supply and financing system in independent contact with farmers, and professional training of staff.

These components all exist outside, but in support, of T & V itself, which is in reality a skeletal transmission system bridging the different levels within a Ministry of Agriculture but not incorporating the many additional functions which any African MOA must support. To get T & V into continuous operation entails far larger 'upstream' commitments than many realise.

As it happens, the Bank's most successful African introduction of T & V has been in Kenya, which shares many of the economic and administrative traits of the Indian states where T & V was perfected. Highland Kenya is a small but densely populated area where for decades peasant farmers have shown themselves eager adopters of innovations (Sprague 1970, Gerhart 1975, Anthony et al. 1979). By 1980, Kenya had enjoyed 25 years of sustained maize breeding research, using as its base the flint (rather than dent) varieties most popular with smallholders. It had a well organised system for supplying certified seeds, unsubsidised fertilisers, and small-scale farm equipment. It had a separate Agricultural Finance Corporation to give loans, and rurally established commercial banks. The Department of Agriculture was well staffed, and organised by zone, Province, District and location. It had received earlier USAID projects promoting result demonstrations, school agriculture, and an agricultural information centre. And, of course, there was the surviving large-farming sector inserted strategically between the smallholder districts, and connecting them to excellent storage and transport facilities.

Not surprisingly, Kenya is a place where time and time again things seem to work. It has Africa's most successful crop authority, the KTDA, and one of its best programmes for private commodity assistance (BAT). It has East Africa's best agricultural college, at Egerton, its most mature and successful settlement schemes, and one of Africa's best irrigation parastatals, the National Irrigation Board. Benor's T & V programme capitalised upon these advantages, adopting as its focus the same practices and maize varieties which had been successfully introduced years earlier. On field visits in 1984 (at a Bank-sponsored conference on African extension), one could see that the T & V farmers were enthusiastic and relatively successful — but no more so than their parents had seemed in the late 1960s (when I was conducting research on innovation in these same areas).

The World Bank introduced T & V extension on a pilot basis in two districts of western Kenya in 1982 (Republic of Kenya 1984), its

initial emphasis being on better maize production through high plant populations, correct spacing, shallow planting, and fertiliser applications. 200 front-line staff were able to deal with roughly 6,000 farmers, or 6% of the total number of farm families. Contact farmers followed the T & V recommendations on specially designated T & V plots, each about 0.1 to 0.2 ha, while continuing their usual practices on the rest of their farms. Crop cuttings at the end of the first season showed a 42% yield increase over 'normal' yields (ibid. 13). However, the Ministry's own data also indicate that contact farmers with the highest T & V plot yields had the *lowest* normal plot yields of the whole sample. A sceptic might interpret these findings as indicating that the best T & V farmers were simply concentrating inputs on their demonstration plots at the expense of lower overall farm yields in the hope of attracting Ministry attention. In any event, Kenya's officials regarded the T & V system as a resounding success. By 1984 they had obtained a further World Bank loan of $23.5 million to extend the project to 30 of Kenya's 44 districts (the 1985 target).

But Kenya is only the most publicised of several World Bank-sponsored T & V introductions into East Africa, including also Ethiopia, Somalia, Sudan, Malawi, and Zimbabwe; the Germans independently introduced it into northern Tanzania and Zambia. There is as a consequence a growing literature on T & V in Africa.[6] The main criticisms have been that it has a strongly 'top-down' and mechanistic methodology, that it assumes available 'off-the-shelf' technologies suited to farmers' needs, that it ignores existing constraints which severely hamper the broader range of MOA activities, that in Africa field staff often cannot divorce themselves from the supply of inputs because of weak commercial infrastructure, that its high costs cannot be recovered by African governments to repay T & V loans, and that it concentrates assistance upon individual contact farmers while neglecting the larger rural population (Moris 1983a,b, Gentil 1989, Howell 1988).

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6. On T & V extension generally, see von Blanckenburg (1982), Howell (1982, 1983, 1988), Gentil (1989), Israel (1987), Moris (1983b) and Roberts (1989). Country experiences are available from Somalia in Chapman (1988) and Mullen (1989), Ethiopia in Dejene (1989) and Zambia in Sutherland (1988). The failure of T & V to reach women in northern Tanzania is discussed in Due et al. (1987).

John Howell, whose papers (1982, 1983, 1988) have independently reviewed the T & V experience, especially stresses the issues of farmer participation and cost recovery — areas of contention which the Bank's own representatives (Roberts 1989) accept as valid. The participation issue arises both on equity grounds and because so many sub-Saharan African farmers are women (see Chapter 3), who seldom get represented among the T & V 'contact farmers' (Due et al. 1987). Faced with large populations and small extension cadres, many African countries prefer their contact staff to concentrate upon groups of farmers, or else to rotate activities among as many individual farmers as possible. The T & V system, on the contrary, emphasises visits on fixed days to a relatively small number of contact farmers per agent. While in theory T & V urges that these farmers represent a cross-section of their community, the methodology as such does not ensure a spread of attention. It probably over-represents active, commercially oriented farmers (who are the most eager to gain Ministry approval in order to tap the subsidised inputs often on offer in African settings).

To understand why cost recovery, essential for future loan repayment, should be an issue, let us review the well documented Somali experience (Chapman 1988, Mullen 1989, Roberts 1989). Somalia's initial five-year, multi-donor project for $35-40 million (the sources differ on the precise amount) had by 1985 achieved a deployment of 185 field agents supported by 109 motorcycles (88 of them reported in 'poor condition'), 150 staff houses completed, and 3 regions enjoying effective T & V activities. This is a modest beginning for a large expenditure, hardly the low-cost reorganisation of an existing service which Benor promises.

More seriously, Mullen (1989) explains that in Somalia the World Bank chose its customary 'enclave project' framework, whose many weaknesses were reviewed in Chapter 4 and whose operational impact is directly counter to the professed goals of T & V extension. Thus while on paper Somalia's T & V project was justified as a means of reorganising and strengthening the National Extension Service, it was established as a separate body under its own General Manager reporting directly to the Vice Minister (thereby bypassing even the MOA's Principal Secretary). This tactic effectively gutted the Ministry's own parallel extension capacity by removing its core function from the Regional and District Co-ordinators. The new project also attracted away some of the Ministry's best staff (Mullen 1989:147), another common fault of World Bank projects. Chapman

(1988) notes that there was initially little support for T & V extension from the Ministry's Agricultural Research Institute. A large USAID technical assistance team (25 man-years planned for Phase I) allied itself more to the Ministry than to the project, generating further internal tensions. With the withdrawal of the USAID contractor the agricultural secondary school supplying field agents to T & V ceased teaching. Between 1983 and 1985, only 15 new agents joined what was supposed to be a rapidly expanding force (e.g. a target for 1985 of 250).

Published reports do not tell the whole story of the many problems in the early years of this project. On a brief visit in 1984, I was shown bags of seed being supplied to farmers where the germination rates were below 20%! The monitoring and evaluation staff added at Bank insistence seemed adrift and unclear why their surveys were necessary. Shortages of fuel kept farmers from running the irrigation pumps for their wilting demonstration plots. There was a real question whether Somalia possessed the technological base to keep T & V in operation, forcing external advisers to improvise as they went (not necessarily bad, given the sorry record of so much of Africa's official research). And, as might have been expected, the American extension staff were initially quite hostile to what they perceived to be an over-mechanistic, 'top-down' approach being implemented in an inappropriate context.

Nevertheless the Bank negotiated a further 5-year project loan, reported variously as being $26.7 million (Chapman) or $51 million (Mullen). In Phase II, the troublesome but central long-term technical assistance component was more than halved (to 11 man-years) while the number of participating donors fell to two. Mullen's field surveys find the project 'highly regarded by village leaders and small farmers', and he judges it by 1989 'an extremely well organised and effective extension system' (1989: 164, 156). This indicates that the troubles evident in 1984 (and mentioned by Chapman) had been successfully resolved. However, the operating costs during Phase II will average about $10 million per annum, 'far in excess of the total annual budget of the Ministry' (Mullen 1989:166).

While the World Bank's plans call for the project to be reabsorbed into the Ministry at the close of Phase II, neither organisationally nor financially is this likely. As Roberts (1989) admits, the Bank's appraisals of T & V focus upon its *economic* viability (the relationship of costs to marginal increases in farmers' output). Howell questions

the system's *financial* viability, since African governments have tremendous problems in raising revenue from the smallholding sector — a main reason why, as noted earlier, they prefer commodity boards which extract repayment before farmers are paid for each season's crop. Is Somalia ever likely to have the public revenues to repay its two T & V extension loans?

Perhaps Somalia represents the 'worst case' East African scenario for T & V, to balance Kenya's 'best case'. African countries adopting T & V for the first time should anticipate several points of immediate friction. Transport and fuel to support field supervisors and training seminars are often a problem. The MOA will need to create its own SMS establishment to do training internally. It must ensure that the research system can deliver a continuing stream of technical recommendations suited to the farmers' situation — a major problem in all but a few countries. It will need a materials preparation unit with access to at least some foreign exchange and with skilled staff. It must set up a monitoring and evaluation unit to assess the achievement of T & V targets (essential to relieve field agents from filing written reports). It must ensure that farmers enjoy independent access to inputs, or modify the T & V system to incorporate this aspect (as several African countries have done). And, finally, it must have access to scientists and resource personnel to guide programme planning, even though these experts will be working within independent institutions.[7]

My own observation is that T & V assumes fairly intensive mid-level management. To keep it in regular operation requires a large organisational input: scheduling seminars, contacting resource people, appointing and training SMS, reviewing off-the-shelf technologies for possible promotion, preparing hand-outs and case studies, and planning each season's changing emphases. Perhaps it is a good thing that T & V highlights the need for effective management, just as we should insist that research scientists come into direct and continuing contact with MOA extension staff. There is also the advantage that the Benor and Baxter (1984) field manual is unusually complete, even containing job descriptions for each T & V specialised position.

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7. Of course, in fully funded Bank projects these components may be included under project financing and thus will not present the same degree of difficulty. See Chapter 9 for suggestions about using the T & V system.

On the minus side, we may note that it is precisely a lack of sustained attention which characterises many MOA extension programmes. Africa's senior administrators, faced with numerous difficulties (see Chapter 5), have been prone to substitute rhetoric for action. The goal-oriented outputs which the T & V system expects from mid-management Ministry staff have been conspicuously absent in recent years. To succeed, the T & V system needs either a strong push from a major donor (which Benor himself supplied in selling the T & V system to the Kenya Government), or else committed MOA leadership. Without a large financial input and strong pressure from above, the T & V system will suffer the same declining performance which earlier institutional innovations have evidenced (Gentil 1989).

Structural adjustment

For Africa, the 1980s could be termed the 'structural adjustment' decade. Whereas in 1979/80 structural and sectoral adjustment loans accounted for a mere 0.6% of the World Bank's total lending, by 1986 they had reached 17.5% (Killick and Commander 1988:1466). From the early 1980s onwards African leaders have been under great pressure by donors, particularly USAID, to readjust their financial and development policies. Killick and Commander (1988:1467) quote a George Schutz directive to USAID missions which stated bluntly:

> Policy dialogue should be used to encourage LDCs to follow free market principles and to move away from government intervention in the economy. This allows the market to determine how economic resources are most productively allocated and how benefits should be distributed.
>
> To the maximum extent practical governments should rely on the market mechanism — on private enterprise and market forces — as the principal determinants of economic decisions.

Particular targets in Africa have been free university education, subsidised urban food prices, the use of cereal marketing boards rather than private traders, and even the parastatals (like KTDA) which a decade before were seen as a 'private' alternative to ineffective civil service institutions (Hulme 1983). As Hulme shows, the same problems evident in Africa have appeared elsewhere; but the financial crises forcing African governments to turn to the IMF make them more vulnerable to pressure.

Major 'conditionalities' designed to restore economic stability have been exacted as the price for bridging IMF funds:

- devaluation of national currencies, to make inputs more expensive locally and to increase competitiveness
- freeing trade from price controls and import restrictions (thus allowing the market to determine the import bill)
- reducing public expenditure by staff and salary cuts where feasible (concentrated in 'unproductive' public services)
- privatising major loss-making institutions
- instituting user charges for education, water, health care, and producer services.

There is an emerging literature on the local impact of structural adjustment policies (see Havnevik 1987, Commander 1989, Bartlett 1990, Brett 1988, Hulme 1983, and George 1988). Suffice it to say that contrary to the rosy expectations held by proponents of economic liberalism (Bartlett 1990), Africa has not immediately benefitted in the fashion predicted.

For extension, the 1980s have been years of further retrenchment to the point that in peripheral areas few effective services continue. Cuts in parastatal staffing have led to the dismissal of field extension cadres, as in Senegal's SAED (Moris and Thom 1990). Wiggins (1988, 1989) notes the irony that donors have exhorted African countries to re-emphasise export crops, while imposing restrictions which further undercut local extension effectiveness. The supreme irony is that the World Bank was simultaneously promoting its T & V system, a 1960s type of public extension at complete variance with the structural adjustment lending portfolio. Readers will want to refer to the many recent World Bank documents justifying the Bank and IMF positions, but they should also read Wheeler's (1984) empirically demonstrated analysis, showing that the underlying problem remains the generally low prices Africa receives for crops it can grow well (like sugar, coffee, and cocoa).

9
Improving Performance

This final chapter gives my own suggestions for improving African extension performance.[1] Leonard once estimated that a package of fundamental reforms could double the productivity of Kenya's agricultural extension services (1973:147). The question then becomes: which reforms should make up the 'package'? Further thinking about extension design is needed because current reforms, reviewed in Chapter 8, concentrate on a few major weaknesses and make strong assumptions about the nature of existing systems, assumptions whose conditions are not met in practice. Table 9.1 depicts some of the many possible extension interventions. Effective output at the bottom requires complex changes throughout the larger system, including measures outside the scope of existing reform initiatives. A menu of possible interventions is presented here to assist analysts in choosing a few key innovations which address major weaknesses in a given system.

The review of alternatives starts with proposals for improving 'bureaucratic hygiene' (based on Chapter 6). Farmer involvement (drawing on Chapter 7) and overall strategies (options complementing those in Chapter 8) are then examined. A concluding section compares the two rival viewpoints about how extension should operate in the field.

Improving internal management

Hyden in a celebrated book (1983) argues that there are no shortcuts to progress in reforming African administration. If the standard approaches are likely to be ineffective, what can be suggested for field supervisors who must continue to work within existing systems?

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1. Other ideas about improving African extension include Moris (1983b:95-114), Leonard (1977:214-217), and Honadle (1982b).

Table 9.1 Potential Extension Interventions by Level

Institution	*Type of Intervention*
International Agricultural Institutes	Greater focus on external aspects Rotate international scientists through them Use as 'mother' institutes for national ones
Agric. policy planning unit	Make sure it exists at sector level Get best people appointed
National Agricultural Research Institutes	Consolidate into a manageable number Give clearer objectives Add FSR and OFR feasibility testing Improve links to district extension
Agric. Information Centres	Establish one per country, link to agriculture faculty and T & V specialists
Ministry of Agriculture	Review staff incentives Institute performance management Improve budgeting system Institute continuous staff retraining Create T & V support institutions
Linkage to field units	Improved communication vital (radiocall, etc) Open to commercial input delivery Improved incentives for field postings
District Agric. Office	Allow DAO to deal directly with research Implement middle-level management package Reorganise tasks into 4 domains: information, inputs & economics, training & groupwork, and special services
Linkage to field agents	Ensure overlap of reporting Fewer agents but more transport/equipment Realistic supervisory spans & work loads Promotions based on field results
Contact Agents	Explore possibility for part-time volunteers Backstop with national media campaigns Retrain on regular basis, upgrade skills
Contact agents to farmers	Combine individual/groupwork Develop targeting for contact farmers Ensure technology is relevant Make agents downwardly accountable Tap existing NGOs, co-operatives

Source: adapted from Moris (1983b), p.121.

(a) The budget

The annual budget remains a field programme's lifeline. Orthodox public administration is correct in emphasising the need to prepare budgets carefully and realistically. Field staff should anticipate that they will need to lobby for their share of the budget. Agricultural

units will also require measures to carry them over the gap between financial years. The intrinsic importance of the budgetary process, as an organisation's main allocative device, means that any improvements here (such as the tracking of expenditures by micro-computer) will have a large influence upon other activities.

(b) Teamwork

There are many reasons (low salaries, lack of resources, poor working conditions, high task demands) to suggest that currently good performance cannot be officially demanded. Effective management therefore depends upon developing a style of leadership which fosters teamwork and mutual commitment. Teamwork grows out of small but crucial details: whether personnel feel the payment of allowances is fair and commensurate with effort rather than rank, whether decision-making is jointly arrived at rather than imposed, and so forth. Unfortunately, civil service practices tend to destroy team spirit and are thus a disincentive to high output.

(c) Training

Managers can make far better use of internal training opportunities. Any large agricultural agency employs various specialists with expertise which can be drawn on to deepen staff skills. Most Ministries of Agriculture possess quite elaborate training facilities, currently under-utilised. Furthermore, if field staff come in to draw their salaries each month (as many do throughout Africa) this can become an occasion for holding staff meetings and doing simple on-the-spot training (see the T & V practice discussed in Chapter 8). Formal training becomes more popular when it is linked to internal employment incentives, such as up-grading trainees' qualification levels.

(d) Derelict equipment/facilities

Most African districts contain under-utilised facilities and equipment: idle cinema vans, tractors awaiting spare parts, dusty map rooms, and the like. The poverty which constrains field extension has also meant that Africa has received a great deal of external assistance in the past. The countryside is littered with broken-down equipment and seldom used special facilities. An energetic field manager can sometimes acquire substantial resources

simply by locating spare parts or by proposing new uses for under-utilised structures.

(e) Staff appointments

It is typically quite difficult to appoint senior staff, and even harder to get them removed subsequently. Where local supervisors have a say in recruitment, they should go beyond paper qualifications to learn how individual candidates have performed on previous assignments. In agriculture, demonstrated competence is extremely important.

(f) Task assignments

Civil service practice is a poor guide for discovering the particular competences of individuals once they have been appointed. Good management requires making the best use of each individual's *strengths* (Drucker 1966). Morale improves when people feel their special skills are used and appreciated. Making better use of existing staff becomes imperative under current budgetary constraints.

(g) Postings

The fact that postings are often under a supervisor's control and their powerful influence upon morale make them a significant factor affecting productivity. Supervisors should resist unnecessary transfers or the use of postings for punishment. There should be a clear-cut policy to guide individual assignments. People should be left in areas of work long enough to become effective. All staff should be required to complete two or three field tours before receiving coveted headquarters assignments. An individual's sequential assignments should be viewed as a ladder for acquiring valuable field experience and expanded competence.

(h) Simple controls

Government regulations designed to increase the degree of control exercised from above can absorb a great deal of staff energy. Insofar as is practicable, control devices should be kept simple and obvious. They should be applied equally to all staff irrespective of rank.

(i) Safeguarding mobility

Gaining regular access to a scattered and poverty-stricken clientele is crucial for agricultural extension, and safeguarding staff mobility should be a high priority concern. This can become a major

preoccupation when fuel is scarce and vehicles inoperable. It may mean that the extension office negotiates the right to maintain its own vehicles — a privilege rarely granted to civil service organisations. Related policy issues concern whether an agency pays staff to use their own transport, and whether senior staff can take official vehicles for private use.

(j) Opportunistic scheduling

We have seen that field units rarely control their own schedules, which are subject to numerous constraints and daily interference from the changing plans of superiors. The implication is that people must be prepared to change their plans at short notice. An opportunistic use of scarce resources is helped if there are weekly meetings to schedule activities.

(k) Prioritising innovations

Bureaucracies have a very limited capacity to tolerate innovations. Major changes are feasible when a new supervisor first takes office, but thereafter will be difficult to implement. To be effective, most administrative innovations should grow out of a common perception of the need for change. They are expensive to launch and will absorb a considerable amount of staff time and energy. Thus supervisors need to prioritise any proposals for change, concentrating on only one or two improvements during any one period.

(l) Rewarding performance

Many ministries use annual confidential reports compiled by supervisors when evaluating performance and awarding promotions. Unfortunately, the way in which these are used can depress rather than improve field performance. It is very important for people to participate in the assessment of their own performance (some countries allow the individual to add his or her own explanations alongside the comments of the superior). The format of the report should also emphasise demonstrated achievements which can be defended publicly. In general, public service organisations need to re-examine how exemplary performance is internally identified and rewarded.

(m) New technologies

A range of new technologies seem especially suited to overcoming

the communication blockages which have characterised African agricultural development: low-cost all-terrain vehicles, radios and other equipment operated by solar power and lap-top computers which can provide sophisticated statistical and word-processing capacity in remote locations. Since information exchange has such a large role within agricultural extension, field workers could make far more imaginative use of new information-linked technologies. This would in turn improve their morale especially when they are located at isolated stations.

(n) Information resources

New equipment and better technical information will quickly disappear unless a district office can provide an institutional 'home' for these resources. Quite often a district will establish its own library of technical documents, which must necessarily be kept secure and thus can serve also for storing maps, computers, and other specialised equipment. A centre of this kind plays a vital role in creating institutional memory; it can also serve as a base for visiting consultants and for conducting staff training.

(o) Exploiting donor interest

These days most capital resources must come from external donors. For poor districts, this is not necessarily a disadvantage. Donors often have a formal commitment to helping those with the greatest need. The dangers associated with external projects have been reviewed in Chapter 4. Provided these are recognised (and compensated for), there is still considerable scope for district leaders to identify new areas for donor assistance. Donors are often short of ideas, so that those defending well prepared projects stand a good chance of obtaining funds.

Stimulating farmer involvement

Once field agencies have pruned and revitalised their internal operations, they are in a position to re-examine the activities which involve clients (Chapter 7). How might they best stimulate farmer involvement?[2]

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2. Those examining farming participation should also consult Chambers, Pacey and Thrupp (1989) and a special issue of *Experimental Agriculture*, 24(3), 1988.

(a) High pay-off innovations

There is abundant evidence that under conditions of high risk and variability, innovations need to yield fairly dramatic returns to be visible to farmers (see Chapter 2). Field programmes cannot afford therefore to emphasise only station-tested research recommendations, which frequently perform less well under highly constrained field conditions. District staff must initiate an active search for promising ideas. If these innovations are derived from local farmers or other sources (such as NGO projects), field staff should serve as brokers to obtain additional scientific assistance confirming advantages and identifying application domains. From whatever source, high pay-off innovations must be seen as the only engine which will drive demand-led diffusion of better technologies.

(b)Early participation

The decisions in project design which have the largest impact on farmers tend to occur early in the project cycle. They concern project location, the choice of enterprises and varieties, recognition of local problems, lay-out of structures (especially important for irrigation schemes), staff recruitment, arrangements for loan financing, and the nature and timing of farmers' contributions. Not surprisingly, studies of irrigation development in Asia have found that unless farmers are involved from the very start, it will be difficult to obtain their subsequent participation. It is strongly recommended that field personnel see themselves as working *with* rather than *for* farmers, and that potential clients are involved from the outset of project planning.

(c) Multiple contact networks

Since resources these days do not permit working in all communities simultaneously, and since each area has its distinctive links to NGOs and various specialised agencies, extension planners should encourage the evolution of multiple contact networks. This means abandoning the 'top-down', control orientation seen in the past. Instead, extension staff need to learn how to facilitate and support the entry of other organisations into a district. A situation of pluralistic service supply already exists in most areas; what is advocated here is to view this situation *as an opportunity* to involve a wider range of client groups and to achieve better feedback if things begin to go wrong in particular communities.

(d) Avoiding loan collection

My personal view is that, under conditions of high risk farming, most forms of crop and input loan financing are undesirable. Where loans must be offered, they should be extended only for high value 'cash crops' secured by the farmers' previous record of high quality delivery to some crop handling organisation. Major donors typically assume otherwise, and try to insist that services provided to all types of farmers be loan-financed. Often crop and input loan funds are given to a parastatal Agricultural Finance Corporation or Rural Development Bank, or perhaps these days even to commercial banks. These agencies lack good intelligence at the local level, and thus turn to the extension service to recommend farmers for loans and then subsequently to enforce loan collection. Benor is undoubtedly correct to insist that extension staff should *not* undertake such duties, which in essence transfer the costs of bad policy-making from the donors and banking system to the extension service itself.

(e) Packages for homesite agriculture

Outsiders have been slow to recognise the special features and crucial importance of homesite agriculture, practised generally by women and children in the immediate environs of the home compound. Nevertheless, the example given by Myers (1986) from Kenya's coast shows what can be done to build up sustainable farming even within a badly degraded environment. Existing practices almost always involve multiple species linked in complex ways: grasses, fruit, perennial crops (like coffee or cocoa), root crops, legumes, small ruminants, trees, and market gardening of vegetables. Household members make intensive and continuous use of very small plots. Considered from the standpoint of long-run sustainability, present systems outperform the agronomists' mono-crop commercial alternatives. This type of farming merits close scientific scrutiny, and can be best understood in relation to concepts like Mollison's 'permaculture' or Stewart's 'response farming' (Mollison and Holmgren 1982, Stewart 1986). Any technical packages developed to suit this situation have the advantage that they will particularly benefit the poor, so-called 'landless' households, and refugees — three groups not well served by present recommendations.

(f) Unconventional species

The lack of response shown by crops like wheat (Byerlee and Longmire 1986), rice (Humpal in Moris and Thom 1990) and introduced (or 'exotic') cattle when grown under African conditions has led some scientists to conclude that there is little scope for technical improvement in African agriculture. The problem is instead that scientists have largely ignored the crops and species which do perform well under African conditions: root crops, fish (*tilapia*), acacias (some species of which are nitrogen fixing), and even goats and camels (Yagil 1985). Of all the continents, Africa is both on average the driest — explaining why camels and goats are very important — and the one whose humid zone relies most upon root crops (Goering 1979, FAO 1986a). If scientists want their 'packages' to be popular, perhaps they should pay more attention to the reasons why producers grow crops other than those familiar in the USA and Europe.[3]

(g) Constraints' analysis

For extension recommendations to be popular, they *must* address farmers' priority concerns, i.e. farmers' perceived problems, needs, opportunities and contingencies, as identified in ethno-scientific decision analysis (Gladwin et al. 1984) — not deductively imputed benefits derived by agricultural economists working at a distance.

This finding seems so obvious that one might wonder why it should be stressed. The reason is because, in order to promote national earnings of foreign exchange, African Ministries of Agriculture often find themselves promoting crops which are no longer attractive to farmers. (Indeed, on some of Africa's largest irrigation schemes tenants have been forced to produce the official crop even at a loss!) To evaluate when high input farming is sensible requires astute judgement about the constraints being experienced at the farm gate. To date, a lack of in-depth analysis of constraints has probably been the research system's most significant failing throughout tropical Africa (see Chapter 2).

Consequently, some version of adaptive, on-farm technology screening is essential: FSR, in other words. Hildebrand's approach to constraints' analysis (1986) should be supplemented in most

3. Here see a series of technical reports by the US Academy of Sciences on underexploited tropical crops.

instances by 'yield gap' analysis to determine specific reasons for the differences between 'average' and 'best' local farmers (De Datta et al. 1978, Gomez 1985). As indicated earlier, the distance between 'best' local yields and on-station research results can be taken as a rough measure of overall systemic constraints. I would go further, and suggest that optimisation techniques are fundamentally inappropriate when applied to systems where actual performance is down in the range of 20-40% of potential technical performance, a level often encountered within African rural development (Moris 1981).

(h) Opportunity analysis

It has been argued (Chapter 2) that the way to locate promising interventions is not, in the first instance, by doing expensive multi-disciplinary studies of the early FSR type (see also Lightfoot and Barker 1988, Greyseels et al. 1986). Instead, outsiders can work with local producers and other key informants to find what seems most attractive within present circumstances. They should employ external knowledge and contacts to widen the range of local choices (Ellman 1987), *without* assuming a radical relaxation of constraints. Only when promising options are identified does the expensive task of identifying constraints and mapping application domains begin. This was, as noted earlier, how ILCA derived its popular 'fodder banks' and 'alley farming' innovations in Nigeria. Essentially, it means starting at the middle of the idealised sequence of stages in technology development, then using expensive and scarce scientific resources to look simultaneously at 'upstream' components and 'downstream' application domains. While not viewed as 'research' by scientists, such 'opportunity analysis' gives structure and priorities to any following scientific inquiry. It is also, needless to say, more popular with clients.[4]

(i) Farmer-to-farmer exchanges

Implicit within the foregoing proposals is the notion that farmers themselves constitute the appropriate starting and end points in any process for designing technical interventions. Called the 'farmer-first-and-last model' by Chambers and Ghildyal (1985), such approaches have begun to receive serious attention within the

4. I am indebted to Jack Keller and Mark Lusk of Utah State University for the label 'opportunity analysis'.

scientific literature.[5] Rhoades (1987) describes how potato storage and processing techniques used by Peruvian growers themselves were the source of ideas which CIP then extended to other farmers. From the standpoint of offering farmers assistance in places or on topics where there are no appropriate 'off-the-shelf' innovations, the farmer-to-farmer exchange approach may be the *only* feasible option.

Under 'farmer-to-farmer' exchanges, extensionists try to pinpoint locally effective practices which the best farmers have already tested and adopted. There is no necessary reason why this approach should be risky and slipshod (as scientists may fear). Most extension services have access to a core group of natural scientists and economists who can help to evaluate and screen any interventions chosen for wider promotion. Furthermore, the Ministry's social scientists should closely monitor other farmers' experiences with novel applications. Thus the role of the extension service becomes that of speeding up the diffusion of novel but effective practices to a wider circle of clients than would occur spontaneously — a function very much like the 'demand-led' extension which many Western policy-makers have advocated. Its attraction as a strategy is that it can be employed even under the adverse economic and institutional circumstances now evident in Africa's poorest countries.

(j) Participative research

Our final suggestion for involving farmers brings them right *into* the research process, in a fashion nowadays termed 'participative' or 'collaborative research' (Reason 1988). For experimentally trained scientists, used to defending 'objective' research divorced from client influences, this may be the hardest change to accept. Its justification depends upon a different concept of intellectual property rights, as well as increased recognition of the benefits which can follow from closer involvement of the subjects of a study in its framing and interpretation.

Essentially, farmers own the information they share with researchers. As research subjects (*not* objects), farmers are the ones who can spot faulty assumptions or unwarranted inferences, because they best understand the limitations of data they convey

5. See footnote 3 above, as well as Ashby et al. 1987, Farrington and Martin 1988, Garcia-Zamor 1985, Norman 1988, and Rhoades and Booth 1982.

to researchers. Furthermore, field inquiry uses a great deal of time and energy. Farmers are much more likely to take it seriously if they understand why a study is being done, if they help prioritise the topics it covers, and if they receive the results promptly. Of course, none of these advantages are enjoyed by traditional, multi-subject surveys of the type which donors like the World Bank have tried to use for monitoring extension impact (Murphy and Marchant 1988). I have argued elsewhere (Moris 1981) that rural surveys of the old type are very demanding of senior staff time, tie up farmers for hours on end, alienate local leaders, erode the legitimacy of development programmes locally, and rarely give illuminating results (many are not even fully analysed statistically). We now have the technologies (through lap-top computers) to analyse survey data in the field and as it is acquired, two tremendous advantages not available to earlier researchers. Thus there is no technical reason why a survey cannot be written up on-site and its recommendations' validity tested by the very same subjects who provided the basic information initially. Such results are of far higher quality, while also giving the direct benefit of findings to those who paid the largest aggregate cost: the clients themselves. Participatory research is not just a fad, to be treated in a jocular and patronising fashion by experimental scientists: it is a powerful tool which can greatly improve the quality and operational relevance of technologically-related rural information.

Towards better extension strategies

The strategic aspect of extension planning concerns achieving a better match between objectives, organisational competences, and field tasks. It necessarily relates to all levels of activity, and to external as well as internal linkages. Suggestions about improving extension strategies are bound to be somewhat speculative, since there is at present a very wide gap between official goals and actual performance. Planners must recognise at the outset that these interventions require backing from those at headquarters as well as those in the field. Those sponsoring reform must deal with the entire service organisation in analysing present weaknesses and then agreeing which changes would most stimulate improved performance.

(a) Policy analysis unit

Most African countries these days conduct marketing research, and also have a planning section in the Ministry of Agriculture. To be effective, these concerns must be closely linked. Either in the MOA or in Finance and Planning there is a strong case for having a small team which explicitly monitors sector policies and deals with donors when structural adjustment measures are under review. Such staff do for the 'policy cycle' what managers do for the 'project cycle'. In Africa, they must especially watch:[6]

- the internal food situation
- export prices and crop performance
- input availability relative to foreign exchange
- staffing and recurrent cost implications of the MOA's project portfolio
- overheads and debt commitments of parastatals.

Giving this advice is easy. Finding and retaining local experts with the necessary skills and experience could be quite difficult, and is the kind of task which is poorly performed by public sector recruitment. Nevertheless, if African countries are to depend upon export crops, and their financial policies are to be dictated by international organisations like the World Bank and IMF, it becomes imperative that each country has its own expertise to monitor and evaluate major agricultural policies.

(b) Creating environmental scanning capacity

A similar function is needed at the district level, where to date many extension departments have shown little reactive capacity. It has been argued here that agricultural environments have many uncontrolled elements of vital significance to farmers: climate, crop prices, emergent shortages, disease outbreaks, locust infestations, and so forth. The MOA's salaried staff are often the only nationals on the scene with the technical skills to evaluate such dangers. Farmers certainly have the right to expect warning when changes occur which might destroy on-farm profitability. Usually these days MOA staff are already in contact with donors and NGOs active in drought relief. Their ability to give early drought warning is very important, an extension function not found in developed countries

6. The scope of work and justification for such a unit is outlined in greater detail in Moris (1983b:98).

(and so absent from the textbooks). However, price fluctuations or the arrival of new diseases can be just as economically devastating. Individual producers are not in a position to observe such phenomena, which are appropriately monitored from the DAO's office instead.

(c) Recognising low-resource limitations

If extension agencies have to operate with very little for recurrent expenses and field operations, this constraint ought to be overtly recognised. Public agencies already face acute financial limitations, but may nevertheless continue to employ wasteful practices. District staff should be encouraged to:

- severely prune unproductive station staff (grass cutters, tea ladies, etc.) still employed by field offices
- limit the number of contact cadres to those who can be supported with at least a bicycle
- actively seek joint activities with better endowed field agencies, NGOs, and specialised central units
- develop a clear-cut rationale to guide the selection of communities and to encourage eventual decoupling
- explore the potential of radio-call to maintain contact with isolated stations and thereby minimise expensive travel
- develop vertical linkages to agricultural colleges as a source of agronomic research rather than funding a parallel network of field research stations
- use the end-of-month salary pay-outs for staff training, team meetings, logistic planning, and input supply arrangements.

(d) Revitalising the FTC/RTC as a logistic base

As noted several times, most African districts already contain either a Farmers' Training Centre (FTC) under the Ministry of Agriculture or an associated Rural Training Centre (RTC). Such centres were popular in the 1960s and early 1970s as places for residential short courses for farmers. They still exist, generally with several classrooms, a meeting hall, an administration block with some offices, and a hectare or two of land (including vegetable gardens, perhaps a tree nursery, and maybe a poultry or dairy unit). Such facilities constitute a more congenial setting for carrying out 'bottom-up' extension support than the typical district agricultural office. At a minimum extension programmes oriented towards women, youth clubs, social forestry, and perhaps functional literacy

ought to be based in an RTC and FTC (buttressing the FTC's institutional 'outreach'). There might also be a small library of technical reports, a map room, and perhaps exhibits of solar power or farm equipment. The RTC/FTC is ideally situated to host staff training seminars at the end of each month, and diagnostic workshops involving outside donors.

By themselves buildings and a farm constitute just a shell: it is the staff's own vision, organisation, and on-going activities which create programme content and thus effective outreach. I can think of several African districts where the entire district agricultural office would be more effective if it were based at the FTC or RTC. In other places, the FTC has its own institutional structure and would oppose being incorporated under the DAO's programme. However, even then it should be possible to accommodate those extension programmes focusing on special groups, e.g. dealing with women, youth clubs, farm planning, bee-keeping, and seedling distribution (which should in turn be seen as part of an agro-forestry programme). District extension planners should recognise the advantages of multiple contact networks, and the necessity of providing the women's programme with its own, attractive logistical base (preferably away from the bureaucratically-oriented district offices).

(e) Special programmes for women

The arguments for separately targeting farmers who are women were reviewed in Chapter 3. From present experience, it seems clear that the usual tactic of appointing women as extension agents is by itself insufficient. As Mutiso (1979) points out, female extension agents tend to be married to other civil servants and often receive urban postings. Spring (1988a) makes the case for examining gender-related effects across the whole range of Ministry programmes, including how farm economic survey data are analysed. As we noted, programmes which would be of greatest help to women are those aimed at resource-poor farmers who have insecure claims on land, severely limited time, and little access to cash (and hence purchased inputs). Special packages addressed to these needs would therefore also assist other disadvantaged groups, perhaps in total 30% or more of those doing farming. It is, as Spring demonstrates from the Malawi experience, the male extension

agents whose attitudes and procedures for dealing with the poor (including women) need to be modified.

(f) Establishing recommendation domains

It was stated in Chapters 2 and 8 that FSR should recognise ecological, economic, and social factors in delineating application domains. Virtually all MOA services divide their work and recommendations according to crops, and these days most also employ some form of ecological zonation (cf. the Zimbabwe case, where all rural lands are categorised into seven capability classifications). To these two starting points for giving differentiated advice need to be added further differences relating to the economic, social, and institutional environments of farming. A significant difference is often, as the Purdue FSR team working in Burkina Faso discovered, whether farmers are subsistence or commercially oriented (Lang and Cantrell 1984), roughly equivalent to 'low input' vs 'high input' farming. The HYV orientation which predominates among older agronomists needs to be balanced by explicit attention to sustainable, low-input farming (ILEIA 1988). When such analysis is done, we discover that for economic reasons farmers may be forced to grow crops which are sub-optimal ecologically (see Blackie's 1984 account of maize growing among poor Zimbabwe farmers). Thus to establish useful recommendation domains is not as simple as it may at first seem. The most important social, economic and ecological categories overlap (as indicated above in relation to women farmers). What extension services need are better targeting *systems*, i.e. better managerial 'software' suited to the complexity of real world smallholder farming.

(g) Using T & V effectively

Many extension specialists working in Africa remain sceptical about the World Bank's T & V system (see Chapter 8). However, from the perspective of 'policy space', this remains the only package of extension innovations which a major donor is willing to support. Poor countries seeking external finance to upgrade extension services have no real alternative to the World Bank's T & V system. For those already involved with T & V (as are many African countries), it certainly would seem desirable to get maximum local benefit from the expenditures incurred. Specific proposals have already been outlined for the three main blindspots within the T & V methodology. What other refinements might amplify the

effectiveness of the T & V system?[7]

- Poor countries may have no choice but to restructure the T & V cycle around monthly staff training seminars, to take advantage of times when field staff come in for their salaries. The longer interval between sessions necessitates more careful advance planning of their content and provision for *ad hoc* sessions.
- Ministry T & V planners can co-opt external organisations through sponsorship of bi-annual inter-projects meetings, to stimulate a horizontal exchange of current information between all agencies working in a province or region.[8]
- Particular attention should be given to ensure that resource personnel from other institutions (research services, universities and crop authorities) are fully utilised. Since most MOA users of outside experts try to avoid paying for them, other incentives must be found if this input is to be regularly forthcoming.
- T & V and FSR activities in the field should be closely synchronised. Perhaps T & V monitoring and evaluation staff could serve jointly as organisers of OFR within the technology development process.
- It is almost never wise to follow the World Bank's policy of establishing its field organisations as separate 'enclave projects'. To become sustainable, from the very start T & V *must* be part of the routine administration of the MOA, not separate from it.
- The World Bank's international influence can be used to tap extension materials prepared in other African countries.
- Any funding for external training should be used wisely!
- Particular attention should be paid to upward communication of farmers' problems into the research system, a key function now advocated by the Bank's own experts (see Cernea et al. 1985).
- One day of each field agent's working week should be kept for special tasks such as groupwork, women's clubs, or field surveys (required by most external donors for their projects). This means in effect that contact extensionists may spend only 3 days per

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7. A number of these changes have already been incorporated into the Bank's more recent T & V projects (Roberts 1989), particularly in West Africa.

8. An innovation observed in Sudan's Darfur Region, where a small ODA-financed team without its own resources has nevertheless facilitated communication between agencies by this device (under Sudanese sponsorship, of course).

week on T & V's formal visits, necessitating changes in the farmer load.

- A clear method should be developed for selecting 'contact farmers' and relating them to their neighbours (now sometimes termed 'follower farmers' in the T & V literature). The T & V system needs a methodology for expanding its contacts to the entire community and for replacing farmers as their technologies evolve.

The emerging 'farmer-first' paradigm

The alert reader will have noticed the implicit 'top-down' or 'transfer-of-technology' (TOT) orientation underlying the list of potential interventions in Table 9.1. This listing was originally prepared for USAID's Bureau of Science and Technology in Washington DC (Moris 1983b). It conforms to the basic assumption common in old-style 'extension' that its primary task is to convey superior technologies into local practice. Farmers are seen as the *recipients* of expert decision-making, either 'adopters' or 'rejecters' of innovations, but not the *originators* of either technical knowledge or improved practice.

Table 9.2 suggests, however, that there is now a rival view of 'extension' being championed by people like Robert Chambers, Robert Rhoades, Gordon Conway and Paul Richards.[9] The 'bottom up' views they espouse differ from the conventional approach in several basic respects. Their 'farmer-first' label suggests they take as given the importance of drawing upon farmers' indigenous technical knowledge, what anthropologists term 'ethno-science'. They see outsiders as being mainly facilitators of better communication between various interested parties (farmers, community leaders, external researchers, service providers, etc.) rather than conveyers of technologies designed by scientists at national agricultural research stations. They recognise the crucial importance of varying systemic contexts, but reject the cumbersome and expensive diagnostic surveys used in farming systems research to analyse these contexts. Instead, they advocate rapid rural appraisal as an emerging kit of techniques designed to promote collaborative diagnosis involving clients in the analysis of their own

9. The Sussex conference whose papers have been published as *Farmer First* included among its participants most of the key players supporting the emerging paradigm.

Table 9.2 Rival Paradigms for Extension Analysis

	Transfer-of-technology Perspective	*Farmer-first Perspective*
Ultimate goal	increase local incomes	alleviate perceived problems
Purpose of extension	technology development & transfer	augment local problem-solving capacity
Means for achieving goal	high input optimised farming	low input sustainable farming
International support	CGIAR centres	IIED, ICRAF, ILEA
National support	Ministries and institutes	NGOs and farmers' associations
Mode of approach	top-down	bottom-up
Information gathering	experimental research diagnostic surveys	rapid rural appraisal Farmers' indigenous technical knowledge
Rationale	innovation theory	empowerment theory
Screening criteria	constraints analysis marginal returns	opportunity analysis perceived advantages
Main disciplines	agronomy agricultural economics	ecology anthropology
Linkages between experts	by academic discipline	by problem-oriented networks
Financing	bank loans to projects	villagers' own resources
Main gurus	Borlaug, Rogers, Swanson, Benor	Freire, Chambers, Conway, Rhoades

problems, i.e. participative rather than experimental research. They promote sustainable, low-input agriculture rather than high-input, optimised yield farming. They include large numbers of anthropologists, but few agricultural economists or agronomists. This does not really matter to them, however, because they are members of an emerging network rather than of an academic discipline. They are where the action is at the moment in thinking about rural extension; all they have lacked is an agreed name, with Chambers' 'farmer first' being the best candidate.

The 'reversals', which bottom-up approaches embody in contrast to 'normal science', are consequently a major obstacle to the

acceptance of these ideas among orthodox specialists.[10] Until now, the usual division of effort within scientific fields has predominated in agricultural research and in the diagnosis of African agricultural problems. Ecologists mapped out agro-ecological zones, agronomists did field trials, agricultural economists determined marginal benefits, and then extensionists transferred the final recommendations, or 'technical packages', to farmers. This TOT model underlies the entire organisation of Ministries of Agriculture with their linked NARS and CGIAR institutions. Research scientists analyse farmers' problems and propose better technologies (if necessary employing FSR to give more relevant solutions), then the Ministry uses the World Bank's T & V system to convey the recommended innovations to clients. It is an orderly and bureaucratically reinforced mode of action, taken for granted by scientists and donors as well as by those in charge of Africa's extension services. To be told that the whole approach is ineffective and wrongly conceived is not a message welcomed by natural scientists, Ministry heads, or international organisations like FAO, ILCA, ILRAD, and ICRISAT.

Furthermore, local projects run by NGOs do not necessarily enjoy more success than do services offered by ministries (or private firms, for that matter). All are subject to the systemic constraints typical of rural Africa: low prices, high risks, corruption, and the patrimonial tendencies of African leaders. Countries with the largest private sectors (such as Zaire, Nigeria and Sudan) are also among the most corrupt; but those with well developed public sectors like Zambia or Tanzania are ineffective and bankrupt. Talking to farmers, while being a desirable corrective to the aloof and overspecialised procedures employed by natural scientists, is in the last analysis only one change in a larger setting where many changes are required.

African users of this study may thus find themselves in a quandary. Their own employers, most older scientists, and highly respected international agencies like FAO (as well as the major sources of finance) are all working within a bureaucratic tradition which denies the basic postulates which younger and more imaginative field analysts now propound. To be frank, we are

10. These are Chambers' terms, developed and explained in his recent work (see Chambers 1983, 1988, and Chambers et al. 1989).

talking about the kind of intellectual warfare which breaks out in times of 'paradigm shift' (to use Kuhn's term) when old solutions are seen as no longer relevant to emergent problems. Many of Africa's best scientists have voted with their feet, by joining international organisations to escape the frustrations evident on every side within Africa. It becomes increasingly unlikely that orthodox science being pursued in the laboratories of institutions like ILCA or ILRAD will deliver technological miracles to solve Africa's food deficits. Nor, under conditions of diminished finance and a collapse of morale, will Ministries of Agriculture regain the influence they once wielded among Africa's disenchanted peasant producers.

The view taken here is that Africa's rural development problems are clearly of a systemic nature, rooted both in the low commodity prices and rising debt which the international system imposes on the continent (Wheeler 1984, George 1988), and in the unsustainable and ineffective administrative superstructure which African states have created since independence. The issue is ultimately whether adjustments within the present system can provide effective answers to Africa's growing poverty (Gakou 1987). While I do not see formal extension as holding the key to Africa's recovery, it is undoubtedly necessary, as one part of a larger solution, that Africa's exploited producers do begin to receive effective services from their governments. As for the larger mess into which many African states have sunk, there must come a point when Africa's own intellectuals join forces with the continent's disenchanted civil servants actively to formulate better forms of governance and economic exchange.

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In this powerful critique of extension experience in tropical Africa, Jon Moris considers both how far agricultural research has succeeded in producing implementable innovations, and how they might best be disseminated. He analyses the organisational, economic and ecological context for agricultural extension, sets out alternative organisational forms, and reviews what can go wrong.

The author then looks at essential management requirements and methods for involving farmers and assesses the implications of the 'farming systems research' and 'training and visit' approaches to extension reform. He concludes by developing his own suggestions for improving African extension performance.

Jon Moris is currently Professor of Anthropology at Utah State University, Logan, Utah. He was formerly a Research Fellow and editor of the Pastoral Development Network at the Overseas Development Institute and has published widely from his experience in eastern Africa. He has advised international agencies on the management of extension, irrigation and livestock developments.

£9.95 ISBN 0 85003 105 2

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