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AGRICULTURAL EXTENSION AND FARMING SYSTEMS RESEARCH

by

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Introduction

In presenting a paper on Farming Systems Research (FSR) at a recent conference, Bartlett commented that his experience in Nigeria was that extension people are hostile to FSR. At an earlier workshop on Agricultural and Livestock Research another FSR expert questioned the usefulness of including an extensionist on a FSR team as it was not clear what such a person could contribute. To me as a professional in agricultural extension both of these views are surprising and seem to reflect a misunderstanding of FSR by extension people on the one hand and of extension by FSR people on the other.

The hostility by extension workers may be a result of FS researchers' criticism that extension people often push the wrong ideas or innovations. There is such widespread agreement on this that Uma Lele (1975:62) calls it part of folklore in developing countries including Africa that farmers often know more about what is wrong with innovations than extension agents and that these agents often do not follow their own advice. This is certainly no compliment unless we wish to congratulate ourselves for our faith in research and our faithfulness in following directives. However as I have argued elsewhere (De Vries, 1976) the blame for extensions failure to offer relevant and useful

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[1]Throughout this paper I use agriculture in its broadest sense to include agriculture, livestock and forestry unless otherwise specified.

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advice must certainly fall equally if not more heavily on the researchers. After all, it is their job to produce useful research results and they are much better qualified to evaluate them than most extension workers.

The feeling that extension has little if anything to contribute to FSR seems to me largely a result of a misunderstanding of extension's role in agricultural development. The role of agricultural extension is often seen as one of getting farmers to adopt the new practices or innovations generated by research (Lele, 1975:62). Extension agents are seen as technical advisers to farmers who prescibe solutions to farmers' problems, which the agents define in the first place, much in the same way as a doctor prescribes medicine for a disease he has diagnosed.

These two contrasting viewpoints raise the fundamental question which I would like to address. What is or should the relationship be between agricultural extension and FSR? Extension and research constitute two important components of what has been called the Tanzanian Technology System (McDermott, 1979), training being the third. What are some of the implications for extension of research adopting a FSR approach? Can extension contribute anything to FSR?

<u>The philosophy of extension and the farming systems approach</u>

FSR has gained a lot of attention over the past few years. It has reduced such popularity that it is now a sort of buzz phrase used and likely misused to justify all types of research projects and related activities. Bartlett and Okorie (1979:1) define FSR as "concerned with the inter-relationships between farm enterprises and between farm enterprises and the household". Norman (1980:5) emphasizes that it is holistic, recognizing and

and focussing on the interdependencies and inter-relationships between the technical and human element of the farming system with the aim of increasing productivity in a way that is useful and acceptable to the farm family. Anandajayasekeram (1979:2) stresses the farmer and his situation as central to FSR. "His involvement increases the possibility of developing an improved system that will address the constraints that he faces". To me the key elements are a focus on farmers' problems, a holistic approach to her or her farming and household situation, linkage between different elements of the system, and the involvement of the farmer in the design of improvements. How does this compare to extension?

Agricultural extension in Africa and much of the developing world evolved out of control governments' attempts to stimulate the production of export crops (De Vries, 1978:33) and out of the extensionist school's attempts to adapt the US cooperative extension system to the situation of the third world (Coombs and Ahmed, 1974:27). What has evolved is in fact something quite different from the original model and which should more correctly be referred to as an advisory service. Table 1 shows some of the important characteristics of the conventional or traditional extension model as found in many developing countries. As its centre is the view that research recommendations are good and should therefore be adopted as quickly as possible by as many farmers as possible. The role of extension is to persuade or even force the farmers to accept these innovations. One can see that this approach fits well with the conventional research approach which largely focused on increasing the yields of export crops or on evolving improved practices which were assumed to be good for the farmers as they increased production of a particular crop or animal.

Table 1. Characteristics of the Conventional and Dialogical Extension Models

		Conventional Extension Model	Dialogical Extension Model
1.	Underlying development theory	Modernization	Liberation
2.	Basic goals	Introduce innovations Increase production	Development of farmers Satisfy human needs
3.	Organizational structure	Hierarchical Bureaucratic	Decentralized Flexible
4.	Decision-making	Centralized Top-down Little farmer participation	Decentralized Interactive Meaningful farmer participation
5.	Staff	Authority Expert: the one who has knowledge	Leader Problem-poser: all have knowledge
6.	Agent-farmer relationship	Agent teaches Agent active-farmer passive	Both learners Both active
7.	Concept of teaching and learning	Learning results from teaching Knowledge is given to learners by teachers Force learning	Learning is an activity of learners Knowledge evolves out of interaction with environment and ideas Voluntary learning
8.	Teaching method	Banking Authoritarian Exhortation Indoctrination	Dialogue Interactive Reflection and action Problem-posing

Source: De Vries (1968).

The conventional model has in fact received a great deal of criticism from both extension educators and others (Coomb and Ahmed, 1974:125-130; Freire, 1973; Lele, 1975:62; Ndonde, 1975:170, 171).

Because of its top-down, authoritarian, and expert-client orientation, it has little in common with the FSR approach. Even such modifications as the Training and Visit System (Benor and Harrison, 1977) which is currently gaining prominence in Tanzania and many other developing countries are often implemented with this top-down and "we know best" philosophy. They can therefore contribute little to FSR except as a channel for the dissemination of results.

In table 1, I have contrasted the conventional model to what I have termed the "dialogical" model (De Vries, 1978, 1980). This model stresses the development of farmers and the satisfication of human needs as its basic goal. It is therefore a participatory and problem centered approach taking the farmer and his or her situation as the basis for extension work. It's essence is the horizontal sharing of ideas between agents and farmers. It is based on a faith in people instead of a faith in research results or "scientific" farming.

This model is new in the sense that it has grown out of disappointing experience in the developing countries with the conventional model and has not been widely adopted. It is old in the sense that it is much closer to the original extension concept than the conventional model and has not been widely adopted. The 1917 Smith-Lever Act which established the Cooperative Extension Service in the US in fact begins "In order to aid in the diffusing among people of the U.S. useful[3] and

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[3]My emphasis.

practical information on agriculture and home economics, and to encourage the application of the same..." (Sanders, 1966:426). From the beginning it emphasized the needs of farmers and conviction or voluntary learning as the mother of change. The FSR approach seems to fit very well with this extension model. Instead of seeing them as opposed to each other or as having little in common, they should be seen as two complementary and closely related components of an agricultural technology system. The following section examines in more detail how the two can complement each other.

The link between FSR and extension

Norman (1980:7) identifies four major stages in FSR: (1) description or diagnosis of present farming system; (2) design of improved systems; (3) testing of improved systems; and (4) extension of improved farm system. Table 2 summarizes the potential linakges between FSR and extension at each stage. As can be seen, there is a great deal both FSR and extension can gain from a close link. FSR can benefit not only in terms of having a channel for the communication of research results to farmers and getting feedback from them and thus seeing improvements in the farming system which is its raison dietre. Extension should also provide a link to the wider community of farmers at all stages and should be a good source of information about the local farming system, people's priorities, and farmers' attempts to innovate. It can also help to arrange and conduct farm level trials.

On the other hand extension would benefit not only in terms of getting relevant new technology which has been carefully tested

Table 2. Interrelationships between Farming Systems Research and Extension

Potential Contribution by Ext. to FSR	Farming Systems Research Stages[1]	Potential benefit to Ext. from FSR
Help identify and understand priority problems.	1. Describe or diagnosis of present farming system.	Careful diagnosis of farmers' problems.
Help define and understand farmers objectives.		Better understanding of objectives and farming systems.
Assist in gathering data-sampling, supervision etc.		
Help define research parameters	2. Design of improved systems.	Critical problems are researched.
Help identify innovations tried by some farmers.		Scientific analysis of possible innovations
Maintain link to farmers.		
Help select and arrange sites for field trials.	3. Testing of improved systems.	Research results relevant to farmers' situation and carefully field tested.
Assist in conducting such trials.		Training of extension workers and farmers.
Provide link to other farmers.		Help with In-service training.
Encourage and facilitate testing by farmers.		Encourage farmers to continue to innovate and learn.
In-Service training of extension workers.	4. Extension of improved systems.	Help with In-Service training.
Adaptation of recommendations to local conditions.		Advice on adaptation of recommendation.
Teaching new system to farmers.		Obtain demonstration materials.
Obtain feedback from farmers.		Obtain simple written material, publications.
Provide practical help to facilitate adoption.		Back up support.

[1]According to Norman (1980).

and is the basis of any sound extension program. It would also have a source of help in diagnosing difficult problems, and a link to people who would be interested and qualified to examine these problems in the hope of evolving solutions. Research should also provide it with back-up support such as assistance in training agents, provision of demonstration materials production of simple publications, and on the spot technical advice. There is therefore a great potential for mutually beneficial cooperation. We will next briefly consider the actual situation.

The existing extension system

As noted above, most of the agricultural extension systems in Africa follow the conventional model (Axinn and Thorat, 1972; Coombs and Ahmed, 1974:27; Lele, 1975:62). Tanzania is no exception. Although there is a great deal of rhetoric about the need to involve peasants in decision-making and learning as the basis for the development of man, in practice farmers are widely treated as ignorant and resistant to change. A brief glance at the newspapers reveals numerous calls on the peasants to produce more by planting on time, using good seed, proper spacing, careful weeding etc. as though farmers lacked all understanding of these basic principles. One can also find many cases where farmers are fined or otherwise taken to task for failing to follow advice.

Responsibility for extension rests with at least four ministries as shown in figure 1. At the Ministry level there seems no clearly defined responsibility for extension. A clear extension philosophy and policy, and job descriptions for extension workers are also lacking. There is therefore a lack of central control and direction. Linkage between extension, research and training

which is primarily expected to be achieved at the Ministry level is also very weak partly as a result of our decentralized extension system and centralized research and training systems.[4] It does not seem likely that the creation of independent para-statal bodies to deal with crop, and livestock research will in itself improve the situation. One in fact might ask how FSR can fit into this system.

At the field level there exist two types of extension systems: (1) the general extension service under the Prime Minister's Office (PMO) and Regional and District Development Directors, and (2) the specialized services under the various centrally controlled, operate largely independently and focus primarily on the promotion of the production of single export crops. They offer an integrated package of inputs, advice and marketing facilities to farmers, often forcing farmers to use or at leat purchase inputs whether they are interested or not (Keregero, et al, 1978; Coombs and Ahmed, 1974:33). While FSR might benefit from this type of extension service, the two seem to have little in common.

The general extension service under the PMO aims to promote agricultural livestock and forestry production in general. It suffers among other things from a lack of focus in terms of well defined objectives and programmes and clear job descriptions for its field workers (Tanzanian Agricultural Sector Manpower Study, 1980:VIII-20).

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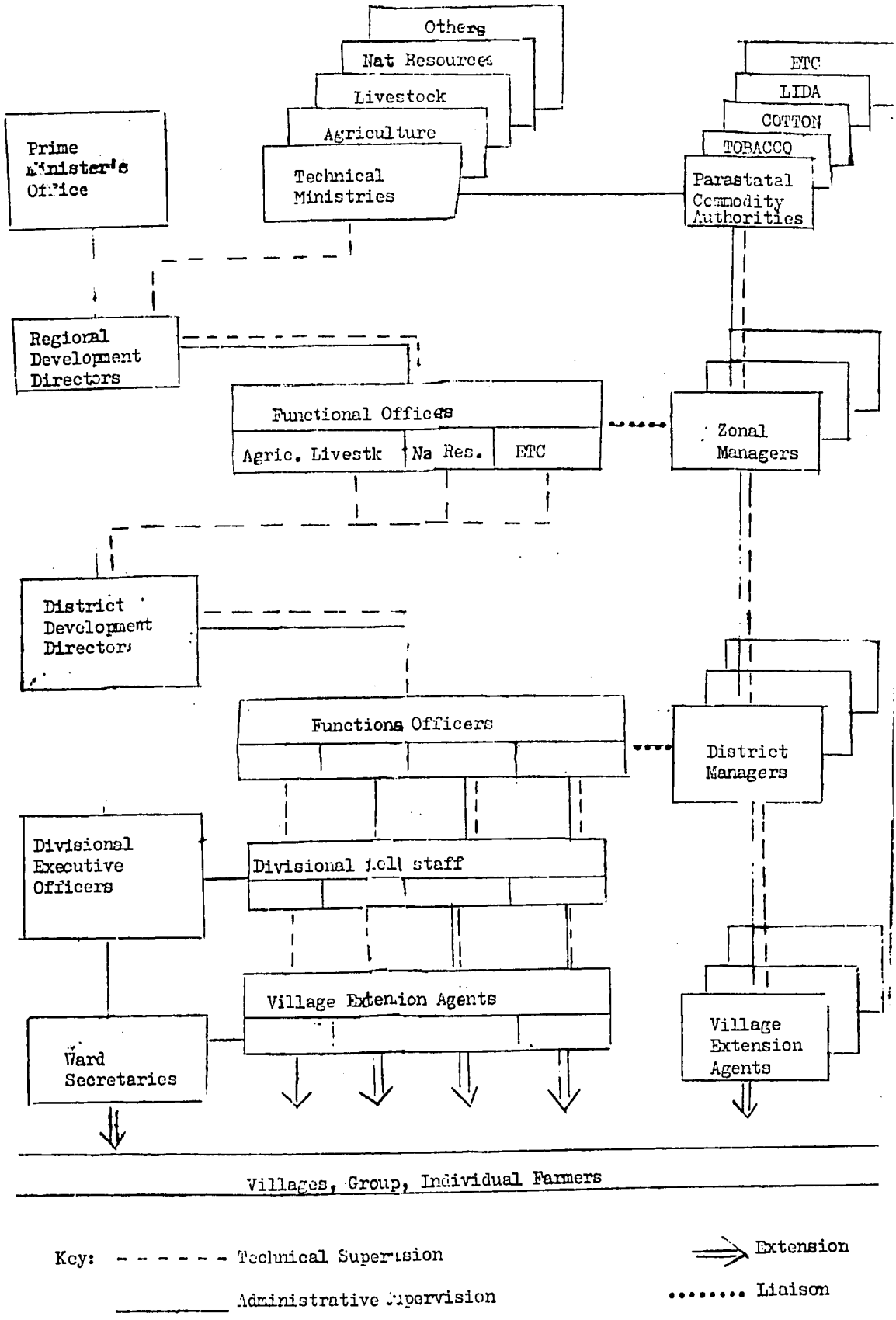
[4]See various papers presented at the Agricultural and Livestock Research Workshop, Arusha 26-3rd Feb., 1979, especially Mannento (1979), McDermott (1979) and the report of the Committee on Research-Extension Linkage.

Figure 7: Organization of Extension Services in Tanzania



Responsibility for this service is decentralized and divided. (Administratively it is under PMO (Regional and District Development Directors) while technical supervision and support is to be provided by the relevant technical ministries (figure 1). This system has resulted in very poor communication between the ministries and "their" field staff with detrimental effects on both sides. It has also resulted in field extension workers being assigned many tasks which not only do not fall within their "normal" role as agricultural extension workers but often are very detrimental to them performing their role (Kauzeni, 1980:46; Tanzania Agricultural Sector Manpower Study, 1980:VIII-31). As shown in figure 1 at the field level there are at least 4 different types of extension agent all potentially serving the same village or group villages.[5] These are the agricultural extension agent or Bwana Shamba, the livestock agent or Bwana Mifugo, the forestry agent or Bwana Nisitu and the agent attached to the relevant parastatal authority (Bwana Pamba, Bwana Kahawa, Bwana Tumbaku, etc.). In 1979 there were a total of 5,350 professional and technical staff in the agricultural sector of whom about 3,600 were working either for the PMO or the parastatals (Tanzania Agricultural Sector Manpower study 1980:111-2). In addition there were about 4,000 field auxillary/attendants classified as sub-technical cadres. When only certificate staff are counted this gives a ratio of about 1,220 farm households per extension agent. If sub-technical

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[5]This does not include Village Managers and Village Management Technicians also under the PMO who are supposed to assist in the planning and management of village activities which are of course predominantly agricultural and with village record keeping and accounting.

staff are included it becomes about 480 households per contact agent. As there is considerable overlap in terms of the households served by various types of agents, most agents especially those under the PMO work with farmers in 3-5 villages.

Depending on the number of agents in an area, they may be supervised at divisional level by a divisional agent and/or the Divisional Executive Officer (Party Secretary or Katibu Tarafa), but are ultimately responsible to their district level counterpart and the District Development Director. Due to scarcity of vehicles at the district and funds to run them and communication problems in general, supervision is in fact minimal. As Kauzeni (1980:45) notes, "field staff are virtually left on their own to decide which particular improvement to push... there are no specific programmes or plans of work."

While there are many other problems of extension which could be mentioned, it is not the aim of this paper to examine the shortcomings of the present extension system. These are in fact well known and well documented. This paper instead aims at giving a brief overview of the present system in order to see how it and FSR can fit together. This is the question we will examine in the following section.

FSR and the existing extension system

If we assume that for the time being there will be no significant changes in the organizational structure described above, we can ask the question, "how can FSR fit in with the existing extension system?"

First, it seems that the philosophy underlying FSR fits much better with the philosophy of development and education as

expounded by President Nyerere (1967, 1978) than with agricultural extension as it is practiced. As I have noted elsewhere (De Vries, 1980) there is a major contradiction between our rhetoric and practice. Nevertheless reflecting on table 2, considerable cooperation should be possible.

FSR suggests a zonal or area-based approach to research. It should lead to a set of clearly defined agro-climatic zones and farming systems within these zones. Although research is presently centralized, this approach seems to fit relatively well with our decentralized extension system. Improvements relevant to specific farming systems would eventually result and to the extent that such systems occur within a given region or district they would have relevance for farmers in that administrative unit. While regions and even districts tend to contain diverse zones, a limited number of systems tend to predominate (Conyers, D., 1973). If the links necessary for FSR are developed it should be possible to communicate findings directly to the relevant extension staff and through them to the farmers. What is required is some subject matter specialist at the regional and perhaps district level whose job would be to maintain contact with relevant researchers. In fact many RADOs already have such people on their staff.

Even with the present structure extension programmes within regions could be organized on a zonal or farming systems type basis. Thus there would be a good fit between extension planning units and FSR units to the benefit of both. Situation analysis by extension planners would thus benefit from FSR descriptive and diagnostic surveys. Problems identified by extension workers could be easily fed into the FSR system. Organization of field trials, farmers' trials, demonstrations, in-service training,

and publications would also readily fit into the same structure.

Such a programming framework would not fit so readily into the present district level planning and funding system. As farming systems are bound to cross district boundaries, extension programmes would also read to cross these boundaries. One solution would be to plan and fund such programmes at the regional level in cooperation with district staff and then let the districts control implementation. Another possibility would be to plan programmes for different zones through committees involving all concerned parties and responsible to the regional development and planning committee. Plans would show to what extent programmes would be implemented in different districts and funds and other resources would then be allocated to the districts on this basis. Districts would be responsible for plan implementation as usual. Nevertheless it seems highly desirable that certain parts of the programme such as the organization of in-service training, provision of back up technical support by Subject Matter Specialists and programme monitoring and evaluation be organized at the zonal level. Publications and other educational materials can best be designed at the research stations as part of the "packaging" of research results.
While the parastatal extension systems focus on a single commodity and also operate in the traditional top-down fashion, FSR should fit relatively easily into this system. These extension progammes are already organized on a zonal basis. Ideally these systems should be merged into a general extension service organized as suggested above on a zonal basis. As Benor and Harrison (1977:11) note, this should result in better use of scare resources and sound technical advice for the entire farming

system. Practically this is not likely to happen. Rather what can be expected and advocated is that the production of these commodities should be seen in the context of the development of the total farming system. The crops in question in fact often tend to dominate in a given farming system. This implies a willingness to see a reduction in the production of a given cash crop should alternatives prove more attractive which goes against the grain of such services. For example research has shown that in Morogoro District farmers can get a much better return by growing sunflower instead of cotton nevertheless farmers continue to be forced to grow cotton. Recent experience in Tanzania indicates however that even when force is being applied to the contrary farmers will shift resources to more profitable enterprises. A refusal to accept this possibility will have little impact other than perhaps channeling scarce resources where they will produce little return.

A great deal has been said about the weak link between extension and research in Tanzania. It is clear that at present little information flows between the two and that messages take a long time to get across. This has resulted in claims on research results piling up on the shelves on one hand and charges that research has few if any useful recommendation to offer on the other. Kauzeri (1980:2, 10) in fact claims both things in the same paper. Thus far the problem has been primarily looked at as a result of the organizational patterns of extension and research and the lack of such links as Subject Matter Specialists, extension liaison personnel, written materials and in-service training. The underlying assumption being that there is in fact a desire to communicate which in turn implies something to communicate about.

If one however accepts the criticsms now being made of conventional research and the position that research in fact has few relevant innovations to offer to the farmers then the problem looks quite different. This is not meant to cast the entire blame on research. Our extension work at the Faculty of Agriculture has revealed that the input supply and marketing systems are often so weak that it is very difficult to introduce even simple and highly relevant innovations such as a new seed variety (De Vries, 1980b). The result is, however, the same. There seems to be no point in communicating with researchers as it is impossible to follow their advice.

Once the problem is seen from this angle, the issue then becomes one of reorganizing research to focus on farmers' problems and situations which in turn will create a need for constant and close contact with the field. Once such research is seen as responsive to farmers' needs and produces relevant and significant innovations which can be adopted, both extension agents and farmers will largely seek contact with the research system. My experience is that farmers are indeed very eager to learn about any innovation which they see as of potential benefit to themselves. Links are likely to develop or be strengthened very quickly once there is a clearly recognized need for communication. There are no major organizational bariers to their development. My hope is that FSR will result in this need.

Conclusion

The FSR approach fits in very well with the basic principles of agricultural extension. Both place the farmer, his or her needs and his or her farming system at the centre of agricultural

development. To be somewhat chauvenistic one might even say that FSR has the potential of bringing research into line with the original concept of agricultural extension. In fact extension as it is practiced in Africa and much of the developing world bears little resemblance to the original concept or even to stated ideology and policy. More modestly one might hope that FSR will help to develop a more dialogical or participatory extension approach in such situations. It is clear that both extension and FSR can benefit from each other.

FSR can fit relatively easily into our decentralized extension system. Clearly defined farming systems would in fact provide a logical framework for the planning of extension programmes and complementary activities within a region. Extension by parastatals while focusing on a single commodity such as say tobacco can also fit into this framework because in certain areas such major cash crops are in fact important in defining a system. What is required in the case of such parastatals is a willingness to see production of "their" commodity in the context of the development of the whole farming system. It seems that with some adjustments FSR and extension can fit well together and potentially strengthen each other considerably.

References

Anandajayasekeram, P. 1980.
"Farming systems and farming sytems research in Morogoro. Paper presented at Second Symposium on Intercropping in Semi-Arid Areas. Aug. 4-7, Morogoro.

Bartlett, C.D.S. and Okorie, E.A.N. 1980.
"Farming systems research questions. Paper presented at Second Symposium on Intercropping in Semi-Arid Areas. Aug. 4-7, Morogoro.

Benor, D. and Harrison, J.Q. 1977.
Agricultural Extension. The Training and Visit System. Washington: World Bank.

Conyers, D. 1973.
"Agro-Economic Zones of Tanzania." BRALUP Research Paper, 25. Bureau of Resource Assessment and Land Use Planning, University of Dar es Salaam, Dar es Salaam.

Coombs, P.H. and Ahmed, M. 1974.
Attacking Rural Poverty. Baltimore: John Hopkins University Press.

De Vries, J. 1980 a.
"Extension or dialogue". Journal of Adult Education in Tanzania, 2:1-8.

De Vries, J. 1980 b.
"Constraints to successful communal production - Testing the dialogical extension approach." AEE Working Paper, 80.9, Department of Agricultural Education and Extension, University of Dar es Salaam, Morogoro.

De Vries, J. 1978.
Agricultural Extension and the Development of Ujamaa Villages. Towards a Dialogical Agricultural Extension model. Ph.D Dissertation, University of Wisconsin, Madison.

De Vries, J. 1976.
"On the effectiveness of extension. A case study of maize growing practices in Iringa, Tanzania," Eastern Africa Journal of Rural Development, 9:1 & 2:37-56.

Freire, P. 1973.
"Extension or communication." In: Friere, P.: Education for Critical Consciousness. New York: Seabury Press, pp. 91-164.

Kauzeni, A.S. 1980.
"Prerequisites for effective agricultural extension service with reference to Tanzania" BRALUP Research Paper, 67, Bureau of Resource Assessment and Land Use Planning, University of Dar es Salaam, Dar es Salaam.

Keregero, K.J.B. ad De Vries, J. and Bartlett, C.D.S. 1977.
"Farmer 'resistance' to extension advice: Who is to blame? A case study of cotton production in Mara Region, Tanzania." RER Paper, 5, Department of Rural Economy. University of Dar es Salaam, Morogoro.

Lele, Uma. 1975.
The Design of Rural Development: Lessons from Africa. Baltimore: John Hopkins University Press.

Mannento, J.E. 1979.
"Linking research and extension." Paper presented at Agricultural and Livestock Research Workshop, 26-3 Feb., Arusha.

McDermott, J.K. 1979.
"Research and extension linkage in Tanzania." Paper presented at Agricultural and Livestock Research Workshop, 26-3 Feb., Arusha.

Ndonde, E.C. 1975.
"Educational methods for self-reliant development." In: Hansel, H., De Vries, J., and Ndedya, P.C. (eds.): Agricultural Extension in Ujamaa Village Development. Morogoro: Faculty of Agriculture and Forestry, University of Dar es Salaam, pp. 164-180.

Norman, D.W. 1980.
"The Farming Systems Approach: Relevancy for the Small Farmer." MSU Rural Development Paper, 5, Department of Agricultural Economics, Michigan State University, East Lansing.

Nyerere, J.K. 1978.
"'Development is for Man, by Man, and of Man': The Declaration of Dar es Salaam." In: Hall, B.L. and Kidd, J.R. (eds.): Adult Learning: A Design for Action, Toronto: Pergamon Press, pp. 27-36.

Nyerere, J.K. 1967.
"Socialism and Rural Development", Dar es Salaam: Government Printer. Reprinted in: Nyerere, J.K. 1968, Freedom and Socialism. Dar es Salaam: Oxford University Press.

Sanders, H.C. (ed.) 1966.
The Cooperative Extension Service. Englewood Cliffs: Prentice-Hall.

Tanzania Agricultural Sector Manpower Study. 1980
Washington: Agency for International Development.