FARMING SYSTEMS RESEARCH AND EXTENSION IN SOUTH AFRICA: LESSONS OF EXPERIENCE

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Abstract

Agricultural researchers, extension workers and developers are faced with the problem that modern improved technology is often rejected by smallholder farmers in developing areas all over the world. The paper analyses the South African problem within the context of the needs and constraints facing smallholder farmers and rural dwellers in developing areas to secure access to markets. Development strategies are briefly proposed arguing the need for comprehensive farmer support programmes. Farming Systems Research and Extension (FSR/E) is identified as an important element of any Farmer Support Programme (FSP). The role of FSR/E in the proposed development strategy is analysed and it is concluded that FSR/E should have its ultimate goal, the promotion of economic, social and structural change induced by technological transformation at all levels in the rural community. Lessons from five FSR/E studies in South Africa are highlighted: (a) identification for research into farmer support systems, community support systems, farmer settlement systems, and commercial farming systems; (b) differences in respect of decision-making responsibilities of individuals, groups and households, via-a-vis implementation responsibilities; (c) support specifically structured toward women; (d) position and role of livestock and multiple cropping systems and risk avoidance; and (e) the need for development goals to be clearly defined and principles and criteria to be followed when considering FSR/E projects. It is further argued that the present South African initiatives in developing a new research policy offers an unique opportunity to restructure research linking institutions in a network where appropriate technological innovation and dissemination is attended to.

Introduction

Landbouwonderwonee, voortkoms en ontwikkelingskonsepsie van koeiese probleem te staan dat moderne tatekologie diensdoe koeiese boere heerse. Swaarom die ontwikkelingswonee, verwys daar. Die referent oordiel die Suide-Afrikaanshe probleem binni die konteks van die beoefes en beperkings wat koeiese boere en landelike gemeenskappe ondervind om toegang tot markte te verkry. Boone kontak Elementale van die onwonee is en in die suide-Afrikaanshe konteks oordiel die probleem wat beoefes en beperkings aan die landelike boere en landelike gemeenskappe ondervind om toegang tot markte te verkry. Die onwonee is oor die volgende elemente van die koeiese boere en landelike gemeenskappe:

1. Introduction

The emphasis placed by the present economic development policies in South Africa on the application of sound economic principles and criteria, on the devolution of decision making and responsibilities and on support to private sector activities, and the facilitation of infrastructural development, would focus pertinent attention and active action towards emerging black farmers (full or part-time). It would be impor tant to design agricultural policies, strategies and farmer models with support to and participation of farmers as major clients. It would require that such recommen dations be based on a thorough understanding of the constraints facing farmers and the formulation of feasible policy options. This is necessary to ensure that the proposed development policies are effective and efficient in delivering the intended outcomes.

In order to provide accurate and entitled to all categories of farmers and structure investment in an efficient and effective manner in the rural community, the following pertinent elements (van Rooyen, Vink and Chisitula, 1987) need to be attended to:

i) the acquisition by individuals of the farm rights to production which would include land security, rents, contracts and quotas;

ii) the adequate provision of appropriate inputs and on-farm infrastructure, and the funding thereof (credit), to the farmer;

iii) the provision of mechanisation services, which cater for agricultural production, planning, processing and cultivation (harvesting and transport to store may also be required) as well as the maintenance of machinery, implements and infrastructure;

iv) the provision of marketing channels and services which is necessary (e.g. grading, storage, packaging and transport);

v) specific development related research to ensure that maximum opportunity can be made of existing and new technology and the provision of adequate extension, information and demonstration thereof;

vi) the provision of training and management support to facilitate the development of managerial skills needed, both on the farm and at an institutional level;

vii) the provision of off-farm agricultural infrastructure necessary to support FSP. The provision of this element differs to that of on-farm fixed improvements and is seldom paid for directly by the farmer.

A deficiency in any one of the above or in the synergy between any two could cause sufficient distortion in the system to result in failure. A permanent planning activity would, therefore, be the harmonisation of the above elements in a systematic manner. Sufficient evidence exists that a farming system approach is central to any policy formulation on FSP (Harwood, 1979; van Rooyen, 1984; Rose and Tapiout, 1984; Bentbridge, 1982).

In this context, appropriate research, technology development, and the developing role of FSR/E should be identified as one of the strategic elements in addressing development problems. A systems research and extension (FSR/E) approach is proposed as the most appropriate strategy in this regard (Silwett, van Rooyen and Gouws, 1988; van Rooyen and Silwett, 1989). Within a FSP policy framework, it is evident that FSR/E would address the whole spectrum of operational support elements, in production inputs, production practices, appropriate equipment, training and extension, marketing and information services.

As an integral part of the development process, the role of FSR/E in development policy and strategy warrants further detail consideration.

The goals of FSR/E should be in harmony with the overall development policy objectives of a particular state or region, and its role should be to support overall development policy. It should focus on national objectives and the farmers' requirements for improved technologies (Gamble, 1984). Goal interdependence in the national objectives, farmer objective functions and FSR/E objectives, would result in FSR/E not being applied as a coherent coordinated strategy, and result in unproductive research efforts.

The expected future emphasis on smallholder farming will have the following consequences, as well as the maintenance of machinery, implements and infrastructure;
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Introduction

The emphasis placed by the present economic development policies in South Africa on the application of sound economic principles and criteria, on the denigration of small-scale farming and responsibilities and on support to private sector activities, and the fact that as a transformed agricultural sector the new black farmers would focus pertinent attention and affirmative action towards emerging black farmers (full or part-time) it would be impor-
tant to design agricultural policies, strategies and farmer support programmes to contribute positively to overall development policy objectives. It should not be argued that FSR/E be subordinated to national objectives in developing the necessary perspectives on diagnostic, applied and adaptive research are considered appropriate (Stilwell and van Rooyen, 1989).

From the above, it is also argued that diagnostic, applied and adaptive research are considered appropriate for development situations as their orientation is problem directed and can contribute positively to overall development policy objectives (Stilwel and van Rooyen, 1989).

South Africa has command over a considerable body of knowledge generated by diagnostic and applied research which needs to be taken and adapted to specific South African environments within which smallholders operate through on-farm testing and adaptation. A case can thus be made for a radical re-orientation of thought and the structure of research and technology development in South Africa, if the demand for appropriate technology is both the commercial and small farm sectors is taken into account.

The farming systems research and extension (FSR/E) approach further offers a methodology that lends itself to integrative and interactive research and development of technology delivery systems. The FSR/E process is considered appropriate as a methodology that lends itself to an integrative and interactive nature linking the various types of research activities into a technology delivery system that is an integral part of the development process, the role of FSR/E in development policy and strategy warrants further detail consideration.

The goals of FSR/E should be in harmony with the overall development policy objectives of a particular state or region, and its role should be to support overall development policy. It should contribute positively to overall development policy objectives. It should contribute to national objectives and the farmers' requirements for improved technologies (Gamble, 1984). Goal orientation and strategy can thus change; farmer support systems, community support systems, farmer settlement systems, and commercial farming systems; b) differences in respect of decision-making responsibilities of individuals, groups and households, via-à-vis implementation responsibilities; c) support specifically structured toward women; d) position and role of livestock and multiple cropping systems and risk avoidance; and e) the need for development goals to be clearly defined and principles and criteria to be followed when considering FSR/E projects. It is further argued that the present South African initiatives in developing a new research policy offers an unique opportunity to restructure research linking institutions in a network where appropriate technological innovation and delivery is afforded.

Amongst the above problems, one of the biggest drawbacks is that the majority of smallholders in South Africa operate on a subsistence basis and earn their income from non-farm activities. The smallholder farming sector forms an important part of the rural economy and is thus important for the country's economic development.

The main purpose of this paper is to provide an overview of the current state of agricultural research and extension in South Africa and to discuss the challenges and opportunities that exist for improving the efficiency and effectiveness of these activities. The paper is divided into four sections: an overview of agricultural research and extension in South Africa, the role of agricultural research and extension in improving farm productivity, the challenges facing agricultural research and extension, and the opportunities for improving the efficiency and effectiveness of these activities.

1. Introduction

The purpose of the paper is to provide an overview of the current state of agricultural research and extension in South Africa and to discuss the challenges and opportunities that exist for improving the efficiency and effectiveness of these activities. The paper is divided into four sections: an overview of agricultural research and extension in South Africa, the role of agricultural research and extension in improving farm productivity, the challenges facing agricultural research and extension, and the opportunities for improving the efficiency and effectiveness of these activities.

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The research phase would compromise research station research and on-farm research in the farmers' fields by way of adaptive research to address the needs and constraints faced by people. Lastly, it is intended to implement promising practices by extension of lending farmers and extension agents (Rose and Williams, 1988). Rose and Williams (1988) reported that to date the focus has been primarily on the diagnostic phase. Some of the relevant features of the rural profile are:

- nearly one half of household heads are older than 60 years of age;
- a high proportion (30-40%) of the feco facto heads of rural household are women;
- of the heads of household younger than 60 years, two-thirds are employed off-farm;
- 21% of wives are also involved in the off-farm labour force;
- only half the household have arable land (hectares average) and only 42% of that land is cultivated at any one time;
- 94% of household income (US$110 average per annum) is non-agricultural in origin.

The researchers found that agricultural needs only ranked sixth in household priorities and were supplied by needs such as inter alia water, roads and employment. Eckert, Rose and Williams (1988) report that the problem facing researchers is to identify smallholders who are 'farmers' and for whom farming is of significant interest. This may embrace only half of rural households. In identifying such farmers in cases of the Ciskei SFSR, significant correlations (P<0.05) were found between various agricultural enterprises. The researchers found that farmers with a larger hectare also have larger areas of winter crops, most animal species, farm implements, etc. The researchers also argue that while most farming systems research programmes concentrate on median farmers, the task differs conceptually in the Ciskei as most households are only passively interested in agriculture. Research and should therefore be concentrated on 'progressive' farmers as the only smallholders interested in agriculture.

Eckert, Rose and Williams (1988) conclude that the two most effective classification system in identifying active smallholder agriculturalists are those possessing four or more stock species and/or those possessing cattle.

The Malekutsu community identified that with pressure on land and resultant decreasing bush, fallow periods and the shortage of water, roads and employment and food production (food imports) have been greater. An increase in the consumer price of staples such as maize is expected to have a greater impact on household incomes than worsen nutritional status. Subsidization of inputs would therefore be expected to harm large numbers of households in urban and rural areas. The rural situation is demonstrated in the Malekutsu area (Beck, 1988).

In the Malekutsu area, the research clearly demonstrated significant yield increases of maize and ground nut yields when planted in an inter-cropping system. Research into tillage practices emphasized that the standard fallow and rain harvesting system with a quick turnaround is preferred and several requests have been received from farmers in the local community for assistance to establish similar units.

The two small dairy units have failed due to the advanced technology employed (eg outstax synchronization) and resultant depression of milk yields. However, another local smallholder on observing the dairy trials has initiated a dairy farm on his own land and has subsequently approached the INR for assistance. Although of the heads of household younger than 60 years, two-thirds are employed off-farm; two-thirds arc employed off-farm; these with their traditional cultivars. Agricultural extension officers need to introduce the farmers to the new cultivars and give them the opportunity to compare these with their traditional cultivars. Extension officers need to introduce the farmers to the new cultivars and give them the opportunity to compare these with their traditional cultivars. Nutritional status, efficiency of labour and time use, productivity of animal species, and for whom farming is of significant interest. This may embrace only half of rural households. In identifying such farmers in cases of the Ciskei SFSR, significant correlations (P<0.05) were found between various agricultural enterprises. The researchers found that farmers with a larger hectare also have larger areas of winter crops, most animal species, farm implements, etc. The researchers also argue that while most farming systems research programmes concentrate on median farmers, the task differs conceptually in the Ciskei as most households are only passively interested in agriculture. Research and should therefore be concentrated on 'progressive' farmers as the only smallholders interested in agriculture.

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Fig 1: The farming systems' research and extension process

Technical and human elements. Secondly, felt needs surveys to determine the needs of the farmers are conducted. This has provided an indication of the perceived problems and development priorities.

The research phase would compromise research station and on-farm research in the farmers' fields by way of adaptive research to address the needs and constraints faced by people.

Lastly, it is intended to implement promising practices by extension, including sending farmers and extension agents (Ross and Williams, 1988).

The researchers, the Agricultural and Rural Development Resources (INR), University of Pietermaritzburg, differs significantly from that taken by ARDRI. In the committee structure, initially a group of respected elders was elected, now it is controlled by members with financial acumen and organizing ability.

The model included off-farm wage earning activities and accounted for differences in the wage earning potentials of individual household members. The researchers conclude that as the main interest of this study centres on production responses, the programming approach was considered to be appropriate.

Policies advocated to improve African food security often assume that most farmers are smallholders of food and that emphasis on cash crops endangers food security. Less than 17 per cent of KwaZulu were self-sufficient in grains and less than five per cent of the Circum sample households sold surplus maize. An increase in the consumer price of a staple such as maize is therefore expected to harm large numbers of households in urban and rural areas. The rural situation is demonstrated in the scenario where a ten per cent relative increase in retail and producer cereal prices reduced the welfare of all households modelled, even through cash incomes increased.

A similar increase in the price of sugar-cane on the other hand, improves the welfare of households in areas where the crop can be grown. If a land rental market existed, land rents would be viable and the welfare of all market participants would increase.

Emphasis on a cash crop does not necessarily undermine food security as risk aversion may result in complementarity of cash and food crops. Since KwaZulu has access to reliable food sources in Natal, affordability is a more important issue than accessibility. Relative increases in cash crop prices are therefore more likely to improve women's nutritional status. Subsidization of inputs would improve the welfare and output of rural households.

Decreasing off-farm wage employment stimulates agricultural production for market and non-market purposes but leaves households worse off. Negative relationships between off-farm production for market and non-market purposes but leaves households worse off. Negative relationships between off-farm wage employment and off-farm income levels predicted for four representative household types, two located in areas of low agricultural potential and two in areas of high cropping potential (Lynne. Ortmann and Vint, 1989).

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Decreasing off-farm wage employment stimulates agricultural production for market and non-market purposes but leaves households worse off. Negative relationships between off-farm employment and food production (food imports) have been observed throughout South Africa. Increased production resulting from rising unemployment is not a success story for agriculture and policy-makers should be aware of the opportunities and constraints imposed upon, the community by both
3.2 Observations and lessons of experience

Lessons from the five implemented FSR/E projects can be gained:

i) All five research models tend to neglect one or more phases of the FSR/E model. The Ciskei SFSR has not proceeded past the diagnostic phase. In the Dry Bean Research and Malekutu projects all the phases were implemented, ie. diagnostic, on-station/on-farm research (technology development) and farmer extension and adoption. Researchers however only subjected the technical research to statistical analysis in contrast to both the Ciskei SFSR and KwaZulu RA where without insights on policy perspectives and farmer problems were gained through analysis of the demographic, social, economic and natural environment within which rural households operate. The Biyela project was supply driven with no diagnosis, however, significant farmer/community responses are observed to the various technological. These responses require empirical analysis in order to arrive at any meaningful conclusions.

ii) A different perspective to the one taken by ARDRI on the SFSR project on the issue to identify “farmers” could render their research on the topic inappropriate. If farmers are viewed as all rural dwellers utilizing resources to produce agricultural commodities, focus is directed towards establishing a system which would promote access to farming and community support systems and extend the area of choice to all rural smallholders (van Rooyen, Visser and Slaafey, 1988).

The structuring of FSR/E to accommodate this type of “all farmer approach” is strongly advocated as operationally a more useful approach to efforts to identify smallholder farmers alike.

iii) In all the case studies with the exception of KwaZulu RA, it appears as if too little engagement is taken of the relation between household economies, and smallholder farming in developing areas (Low, 1984). In both the Malekutu and Biyela projects, farming was adopted. Research system, while the dry bean project did not investigate integration within the farming system.

It is strongly proposed that the sustainability of systems in South Africa is in terms of the wider household context, assessing the impact of technological innovation within the household economy of resource use and vice versa.

iv) In both the Malekutu and Biyela projects, stringing of farmers’ experiences had been taken in collective action in requesting assistance while risk-taking and decision-making on implementation was at the individual (household) level.

The lack of an effective grain-route committee system in the Ciskei SFSR has resulted in no on-farm research extending beyond the 1980s. The collective action institution operating at grain-route level need to be pertinently integrated into the FSR/E design.

v) The findings of the Ciskei SFSR in respect of the large portion of women heads of household is indicative of the hierarchical neglected need to research and structure support specifically towards women “farmers” and their role in household decision making.

vi) The positive correlations between the number of farm enterprises as a system of classifying effective farmers, as reported in the SFSR and, in particular, the number of types of livestock kept indicates the role of livestock in the farming system.

vii) The degree of risk avoidance practiced by the farmer is illustrated in the KwaZulu RA. The large portion of farmers adopting intercropping systems at Malekutu also indicates the risk avoidance strategies followed by farmers.

viii) The KwaZulu RA illustrates that the whole farming system including labour and household income should be considered in considering policy. It further proposed that the same audit apply when introducing different technologies, eg. biological, chemical, mechanical etc. It would be important to determine who were net winners and losers (Pinstrup-Andersen, 1982).

In conclusion, it can be stated that FSR/E in South Africa needs to be directed towards addressing the problems faced by farmers in an integrated farm and household system, rather than directing it at a single crop system. Various the economic and social cost of adopting new technology is minimal as in the case of neutral technologies eg. in the case of introducing new improved seeds. Further, given the large number of women heads of household and the large number of households not in the position to exploit farming opportunities as a more economic activity. Community Support Systems Research should receive particular attention (Stilwel, van Rooyen and Goosen, 1989).

3.3 The design of future FSR/E projects

It is argued that it would be important and necessary condi- tion for progress to structure FSR/E according to a definite set of criteria and principles.

3.3.1 Principles

The following principles are proposed:

a) An overarching goal of FSR/E should be to bring about transformation in the rural system, and plant farming, leading to technical, economic and social structural change where benefits are larger than the costs.

b) A household economics view to be structured as basic framework of reference to determine the im- pact of technical innovation within the household economics and resource use and vice versa.

c) FSR/E should be viewed as one element of a co-ordinated framework of reference to determine the impact of individual farmer settlement and participation within formal agricultural development projects.

d) FSR/E should assist policy makers and planners in the design of formal and informal national and regional development policy and plan, and be prepared to plan on the basis of projections expected by farmers within their natural/physical and socio/economic environments.

e) In the design of a FSR/E programme, a missions oriented approach should be adopted, identifying specific ob- jectives to be reached during each step.

3.3.2 Criteria

The following criteria should be considered:

a) Farmers are defined as all those using resources for the production of agricultural commodities.

b) FSR/E should be directed at solving the farming problems faced by the rural households.

c) FSR/E should primarily be designed within those contexts faced by the farmer, over which he has control.

d) FSR/E should be adaptable enough to allow for a “learning by doing” approach to be followed by farmers and researchers.

e) The FSR/E approach should be multi-disciplinary and take into account the social, technical, environmental, financial and economic variables operating in rural communities, as well as within the wider economy where the rural/urban interface should be pertinently emphasized.

f) FSR/E should seek to follow an evolutionary, rather than a radical approach to technological innovation.

g) In the event of radical technological change being advocated by planners as the only alternative, FSR/E should be directed at solving the farming problems faced by the rural households.

3.3.3 Differring Farming Systems

South Africa is in and will most probably continue to be charac- terised by different farming systems over the long-run.

Within various development strategies, ie. Community Support Programmes (CSP), and Farmer Support Programmes (FSP), Farmer Settlement (FS) including commercial farming (CF), it would be necessary to identify research systems to address the pertinent needs of various domains.

Community Support Systems Research (CSSR) would be tar- geted at that large portion of the rural households that do not have access to productive land or are not interested in farming and would consist of benchmark and field surveys, analysis of these needs, the formulation of appropriate community support programmes and obtaining commitment and participation of the community to implement those plans, eg village water supply projects, community gardens, sewing clubs, clinics, schools, etc.

Farmer Settlement Model Research (FSMR) would be directed at the description, design and testing of optimal institutional, technological and economic programmes for individual farmer settlement and participation within formal agricultural development projects.

Farm Systems Research and Estinctions (FSRE) would consist of the identification and study of present farming systems, the identification of major problem areas, design of the ap- propriate research and development strategies, the interpretation and testing thereby of extension staff and farmers and the further testing of the same findings within the broader smallholder farming community as part of a comprehens over Farmer Support Programme.

Commercial Farming Systems Research (CFSR) would be tar- geted at fully commercial farmers and study their present farm- ing systems, identify major problem areas, design multi-disciplinary research station experiments, on-farm training and extension thereof to the broader commercial farming com- munity. The value of FSR/E in commercial situations should not be underestimated.

Present FSR/E studies only address the active smallholder farmers’ requirements and attention is needed in respect of CSP, PS and CF.

4. Institutional requirements

In order to ensure that national and regional development policy is promoted and the technological requirements of all farmers are addressed in an coherent manner an effective institutional structure is required. Provision should be made for linking of policy and decision making, national and local level with a technology delivery system of research and extension response to the registered needs of both commercial and smallholder farmers.

The present South African initiatives is developing a new research policy by the re-structuring of agriculture from “own affairs” to “a general affairs” initiatives and the promotion of an Agricultural Research Council provide an unique opportunity for reviewing and re-structuring the agricultural research and technology delivery system (Stilwel, van Rooyen, 1989). Goes policy movements away from “Own Affairs” to one agriculture, as well as the recent return of agriculture in terms of homogenous farming areas, Regional Development Centres are proposed that attend to all levels of research, ie. CSP, SFSR, FSR and CFSR as an integrated economic policy framework. These centres should be staffed by multi-disciplinary teams attending to policy and farming systems analysis, technical research and the extension of new improved technologies.

It would be important to create an institutional framework that accommodates both private and public sectors, as well as accommodating policy-making and the farmers. A network linking, research stations, research centres such as SKIIRI, CSIR, IFAYT (south-east African region) and universities with agricultural faculties in a network, where appropriate technological innovation and delivery is attended to must be actively promoted (vanRooyen and Stilwel, 1989). Figure 2 presents a schematic representation of the proposed institutional structure making a efficient technology delivery system possible.

5. Conclusions

FSR/E should not be viewed as an academic exercise to get in- volved in development, but as a component part of a com- prehensive support strategy directed towards smallholder farmers, households and communities in resource-poor situa- tions.

FSR/E should be seen as its ultimate goal the promotion of tech- nological transformation in rural households through farming systems, by addressing that 50% and more of the income of the smallholder farmer, thus equipping him for the challenges of a more efficient farming system. Within the important in- tegrated rural development context, it is required that FSR/E be approached within the household economic framework of reference and extended to the other components of Support Systems Research, and Commercial Farming Systems Research and Extension. This study aimed to bring to light new needs and in particular, make provision for the women.

Public sector has an important role to play in funding FSR/E and a high return on investment can be expected. However, such research should be related to the development of national policy and strategies, and be based on sound principles and design criteria.
3.2 Observations and lessons of experience

Lessons from the five implemented FSR/E projects can be gained:

i) All five research models tend to neglect one or more phases of the FSR/E model. The Ciskei SFSR has not proceeded past the diagnostic phase. In the Dry Bean Research and Malekutu projects all the phases were implemented, i.e. diagnostic, on-station/on-farm research (technology development) and farmer extension and adoption. Researchers have only focused the technical research to statistical analysis in contrast to both the Ciskei SFSR and KwaZulu RA where wider insights on policy priorities and farmer problems were gained through analysis of the demographic, social, economic and natural environment within which rural households operate. The Biycla project was supply driven without any diagnosis, however, significant farmer/community responses are observed to the various technologies. These responses require empirical analysis in order to arrive at any meaningful conclusions.

ii) A different perspective to the one taken by ARDRI on the SFSR project on the issue to identify "farmers" could render their research on the topic inappropriate. If farmers are viewed as all rural dwellers utilizing resources to produce agricultural commodities, focus is directed towards establishing a system which would promote access to farming and community support systems and extend the area of choice to all rural smallholders (van Rooyen, Vink and Slaetey, 1988).

The structuring of FSR/E to accommodate this type of "socioeconomic" approach is strongly advocated as operationally a more useful approach to efforts to identify smallholder farmers alone.

iii) In the case studies with the exception of KwaZulu RA, it appears as if too little engagement is taken of the relation between household economies, and smallholder farming in developing areas (Low, 1984). In both the Malekuti and Biycla projects, farming was adopted to research systems, while the dry bean project did not investigate integration within the farming system.

It is strongly proposed that the sustainability of systems is important in terms of the wider household context, assessing the impact of technological innovation within the household economy of resources use and vice versa.

iv) In both the Malekuti and Biycla projects, arising greenhouse farming economies have tended to collective action in requesting assistance while risk-taking and decision-making on implementation was at the individual (household) level.

The lack of an effective grass-roots committee system in the Ciskei SFSR has resulted in on-farm research being stalled as of date. The collective action institution operating at grass-roots level need to be pertinently integrated into the FSR/E design.

v) The findings of the Ciskei SFSR in respect of the large proportion of farmers heads of household is indicative of the hitherto neglected need to research and structure support specifically towards women "farmers" and their role in household decision making.

vi) The positive correlations between the number of farm enterprises as a system of classifying effective farmers, as reported in the Ciskei SFSR and, in particular, the number of types of livestock kept indicates the role of livestock in the farming system.

vii) The degree of risk avoidance practiced by the farmer is illustrated in the KwaZulu RA. The large portion of farmers adopting intercropping systems at Malekuti, also indicates the risk avoidance strategies followed by farmers.

viii) The KwaZulu RA illustrates that the whole farming system including labour and household income should be considered when considering policy initiatives. It further proposed that the same procedure would apply when introducing different technologies, e.g., biological, chemical, mechanical etc. It would be important to determine who were net winners and losers (Plesnup-Andersen, 1982).

In conclusion, it can be stated that FSR/E in South Africa needs to be directed towards addressing the problems faced by farmers at an integrated farm and household systems, rather than directing it at a single crop system, unless the economic and social cost of adopting new technology is minimal as in the case of neutral technologies e.g. in the case of introducing new improved seeds. Further, given the large number of women heads of household and the large number of households in the position to exploit farming opportunities as a main economic activity, Community Support Systems Research should receive particular attention (Stilwell, van Rooyen and Groves, 1988).

3.3 The design of future FSR/E projects

It is argued that it would be an important and necessary condition for progress to structure FSR/E according to a definite set of criteria and principles.

3.3.1 Principles

The following principles are proposed:

a) An overarching goal of FSR/E should be to bring about transformation in the rural system, plant and farming, leading to technical, economic and social structural change where benefits are larger than the costs.

b) A household economics view to be structured as basic framework of reference to determine the impact of technical innovation within household economics and resource use and vice versa.

c) FSR/E should be viewed as one element of a comprehensive Farmer Support System, while planners and designers should ensure that upon adoption by farmers, the other elements are in place.

d) FSR/E should assist policy makers and planners in the design of a balanced national and regional development policy and plans, and be provided with information expected by farmers within their natural/physical and socio/economic environments.

e) In the design of a FSR/E programme, a milestones approach should be adopted, identifying specific objectives to be reached during each step.
In this context, a phased approach with clear milestones should be followed, ultimately leading to large scale comprehensive Farmer and Community Support Programmes aimed at enabling these areas to make a positive contribution to the national economy.

References


ECKERT, JB. (1988). The small farm systems research project : A mid-project review. A report to the Agricultural and Rural Research Institute (ARDRI), University of Fort Hare, Ciskei, March 1988.


Figure 2: Policy/Decision making/Research station - and on-farm research and extension in an institutional framework

In this context, a phased approach with clear milestones should be followed, ultimately leading to large scale comprehensive Farmer and Community Support Programmes aimed at ameliorating the economic depression of less developed areas and enabling these areas to make a positive contribution to the national economy.

References


ECKERT, JB. (1988). The small farm systems research project: A mid-project review. A report to the Agricultural and Rural Research Institute (ARDRI), University of Fort Hare, Ciskei, March 1988.


