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THE ROLE OF EXTENSION IN TRADITIONAL AGRICULTURE : EVIDENCE FROM THE FARMER SUPPORT PROGRAMME[1]

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ABSTRACT

This paper evaluates the extension and training element of the FSP as implemented in the farmer support programmes of Venda and Lebowa. The importance and contribution of extension and training in the success of the programme can be judged from this paper. The general conclusion of the paper is that extension and training play an important role in FSPs. They are closely associated with increased production. However, to what extent it contributed towards increased production remains a point of contention. Some analysts and observers argue that only the rural elite has access to FSP related services. Results from the analyses in the paper, however, show that comparable households achieve higher yields when they get appropriate extension. Training and extension thus at least partly contribute to higher maize yields in FSP areas.

UITTREKSEL

Hierdie artikel beskou die opleidings en voorligtingskomponent van die kleinboer ondersteuningsprogram ("Farmer Support Programme" - "FSP") soos dit in sekere gebiede van Venda en Lebowa geïmplimenteer is. Die belangrikheid en bydrae van voorligting en opleiding in die sukses van hierdie program blyk duidelik uit hierdie artikel. Die gevolgtrekking word gemaak dat voorligting en opleiding een van die belangrikste elemente van hierdie program is en nou geassosieer word met verhoging in produksie. Tot watter mate opleiding en voorligting tot die verhoging in produksie bydra, bly egter 'n punt van dispuut. Ontledings in die artikel toon egter aan dat vergelykbare huishoudings meer produseer indien hulle gepaste voorligting ontvang. Dit wil dus voorkom asof opleiding en voorligting ten minste gedeeltelik bydra tot hoër opbrengste in die gebiede waar die kleinboer ondersteuningsprogramme geïmplimenteer is.

1. INTRODUCTION

In response to the ineffective and costly large scale project approach in homeland agriculture, the Development Bank of Southern Africa introduced the concept of a small holder farmer support approach to aid the development of black agriculture in South Africa. Considering the various constraints faced by small farmers in the homelands (cf. Van Rooyen *et al*, 1987), the farmer support programme (FSP) was designed with the development objective being formulated as: "The promotion of structural change away from subsistence agricultural production to commercial production, by providing comprehensive agricultural support services and incentives to existing farmers". This objective was later revised to be as follows: "To promote economic development by improving farmers' access to support services over a broad base in a sequential and evolutionary manner" (Van Rooyen, 1993).

In order to reach this objective the FSP comprises six basic elements, i.e. the supply of inputs and capital to farmers, mechanisation services, marketing services, extension services, training and access to production rights and bulk infrastructure. In analysing the financial contribution towards the various FSP elements, Van Rooyen (1993) found that the largest share of the funds went to financing of infrastructure and marketing (38.6%) and moveable assets (29%). The financing of production inputs received 26.5 percent of the funds while

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Table 1 : Summary of the areas surveyed and sample sizes

Major region	Sub-region	Sample size	Usable questionnaires
Venda	Mashamba	75	50
	Khakhu	73	41
	Total Venda	148	91
Lebowa	Phokoane	131	92
	Total Lebowa	131	92
TOTAL		**279**	**183**

extension and trainingattracted only 2.6 per cent of the funds budgeted for the FSP over the period 1987 to 1991. These funds were mainly used for general infrastructure and equipment for the extension effort. The extension function, however, remains largely the responsibility of the homeland governments rather than the implementing agent in each of the two cases examined in this paper.

This paper evaluates the extension and training element of the FSP as implemented in the farmer support programmes of Venda and Lebowa. The paper furthermore also endeavours to show the importance and contribution of extension and training in the success of the programme.

The paper is largely based on results obtained from surveys of rural households in the areas where FSP's were implemented. The surveys consisted of structured interviews which were done during 1991. The random sample of respondents in each of the survey areas included farmers that participated in the FSP and those farmers who did not make use of the support services ("non-FSP farmers"). A summary of the areas surveyed and the sample sizes in each of the areas are provided. The data used in the analyses of this paper were obtained from these household surveys. In addition information was also obtained from officials of the respective implementing agents, ie. Agriven and the Lebowa Agricultural Corporation (LAC).

In order to determine the impact of extension it is important to have correct and valid yield data. The yield data used in this case were provided by the respondents. This therefore only included recorded yields and admittedly does not include the use of maize before harvesting, theft and other aspects that go largely unrecorded. However, in the specific cases analysed, the latter losses were insignificant according to both the respondents and officials.

2. THE EXTENSION SERVICE IN THE VENDA FSP

2.1 Background

The farmer support programme in Venda was implemented towards the end of 1988 in three target areas, i.e. Khakhu, Mashamba and Mulima. Each FSP area has its own co-operative and credit, ploughing services, inputs and other services are provided to the farmers through the co-operatives. The evaluation of the farmer support programme in Venda was conducted in two of the three FSP's, i.e. Khakhu and Mashamba. Data from household surveys in these two areas, conducted during 1990/91 and information gained from interviews with various officials were used to assess the extension element of the Venda FSP.

2.2 A general overview of the Venda extension service

Extension services are provided by the Venda Department of Agriculture and Forestry, while the local agricultural development corporation (Agriven) provides training on project-related matters. The Mashamba ward is served by two extension officers, while only one extension officer attends to the training and information needs of the farmers in the Khakhu ward. A great deal of training is also done through the various levels of the extension service of the Venda Department of Agriculture and Forestry, as well as Agriven. Studies by Bembridge (1988) and Naledzani (1992) found the Venda extension service to be operating at a very low efficiency level due to inadequate training and various other factors hindering the efficient operation of the extension service. There is a complete paucity of subject matter specialists within the Department of Agriculture and Forestry. During 1989, only four agricultural graduates were employed by the

Department. There are no subject matter specialists to play the key role by making contact with research stations, executing and supervising adaptive research programmes on farmers' fields, training field staff, and obtaining feedback from the field staff on farmers' problems. Evidence shows that the linkages between research, extension and farmers do not function effectively in Venda. The situation has been found to be similar in other national states.

2.3 Extension in the Venda FSP

At all the FSPs, extension was provided by the Department of Agriculture and Forestry as provided for in the project description. According to the Programme Manager of the implementing agent, Agriven, this institutional arrangement is not conducive to increased production, as the extension officers do not necessarily report to him despite the provisions of the project description. It is therefore felt that the extension officers should have been permanently seconded to Agriven with the aim of reporting directly to the Programme Manager or his delegate for an improved supervisory/subordinate relationship. The efficiency of the extension service can thereby be improved and its responsiveness to the development activities of the FSPs enhanced.

The present line of reporting in the FSP extension service thus does not encourage efficient management. The coordination and cooperation between Agriven and the extension officers appears to be a major problem in the implementation of FSP's in Venda.

The training of the extension officers serving the FSPs should be upgraded as a matter of priority. Such extension officers should also introduce a programming approach in their day to day activities in order to improve contact with the farmers and facilitate adoption of improved varieties/techniques.

According to the survey of rural households in Venda referred to above, the sentiments regarding the extension element of the FSP in Venda as discussed above, were shared by the farmers, who generally regarded the extension effort to be inefficient. The demand for information is high, considering that 89 per cent of households expressed the desire or need to see the extension officer more often. Only 49 per cent of the farmers regarded the quality of the extension service as good. However, the service is viewed as being generally available with 80 per cent of the respondents being able to make use of the service when required. Because advice and support are often linked to the mechanization service, farmers' perceptions might indicate that extension is available. This is not necessarily correct as inadequate extension was listed by 51 per cent of the respondents as one of the major problems experienced in farming. Furthermore, low attendance rates at training courses, i.e. crop production, soil conservation, crop storage, farm budgeting and livestock improvement, were also identified.

2.4 The contribution of extension to increased agricultural output

Comparisons between farmers participating in the Venda FSP and the non-FSP farmers revealed that the FSP farmers produced on average 0.84 tons (12.03 bags) of maize per hectare compared to the 0.55 ton (7.92 bags) of the non-FSP farmers. This difference is significant at the 1% level. The question now arises whether the FSP contributed to the increase in agricultural (maize) output. An analysis was done to determine the factors which could be related to increased (or surplus) production. If these factors could be related to the elements of the FSP then higher yields can be associated (at least partly) with the FSP.

An econometric model was designed and tested to estimate the relative importance of the Farmer Support Programme on levels of farm output. The model discriminated between households that sold produce (surplus producers) and those who did not produce enough for subsistence needs and need to purchase maize meal. (The minimum subsistence level was estimated at around 1 tonne of maize.)

It was postulated that sellers of farm produce would use more fertilizer, spend more on contractor services, use more FSP credit, rent more land, purchase more chemicals, etc. than non-sellers. In addition, it was anticipated that the incidence of households who knew the agricultural officer, and of households that owned farm machinery, would be higher amongst sellers.

The results of the discriminant analysis are presented in Table 2. The error count for the classifications was 14.33%. The relative importance of each explanatory variable in discriminating between surplus and deficit producers is given by the magnitude of its partial r^2 value and the standardized coefficient.

The discriminant function in Table 2 was estimated with the following explanatory variables distinguishing between surplus and deficit producers: the perception that soil erosion affects production; availability of ploughing services; education expenditure and use of chemical fertiliser. The variable "soil erosion affects production" test

Table 2 : Estimated discriminant function for surplus and deficit producing households in Venda, 1991/92.

Explanatory variable	Standardized coefficient		Partial r^2	Signifi cance	Group means		
	Surplus	Deficit		P < F	Surplus	Deficit	Significance P < t
Soil erosion affects production	2.917	4.164	0.1791	0.0917	1.161 *	1.433 *	0.0856
Availability of ploughing services	18.394	12.079	0.2603	0.0520	1.000 *	1.100 *	0.0002
Education expenditure	-0.0110	-0.0077	0.3206	0.0222	110.39	102.21	0.0143
Use of chemical fertilizer	0.0159	0.0158	0.0871	0.1000	156.55	90.387	0.3473
Number of cases					25	30	

* = Dummy variable with 1 = yes and 2 = no.

producers' awareness of soil erosion and soil conservation. It was found that surplus producers through their contact with extension officers, were more aware that soil erotion affect production of maize negatively. This clearly indicates the positive value of and need for an appropriate extension service in preserving the fertility of the soil through applying soil conservation practices. The important contribution of extension to increased production is furthermore illustrated by, and linked to, the variable "use of chemical fertilizer". This variable, however, also explains the importance of the availability and financing of inputs as contributing to increased production. The role of the availability of the ploughing service accentuates the importance of access to appropriate services.

The discriminant analysis indicates clearly that in the Mashamba and Khakhu areas of Venda factors associated with the FSPs (i.e. extension, ploughing services, inputs) are significantly associated with differences between deficit and surplus producers. The use of fertilisers and ploughing services is furthermore significantly correlated with the provision of credit ($r = 0.943$; $p = 0.003$). This illustrates the positive effect of the Farmer Support Programme. It can therefore be stated with relative confidence that the elements of the support programme contribute, at least partially, towards an increase in agricultural output. It also appears that extension, despite the reported inefficiencies and lack of coordination, also production. The transfer of knowledge through contributed to increased production.

3. THE EXTENSION SERVICE IN THE LEBOWA FSP

3.1 Background

The Phokoane FSP was the first FSP to be established in Lebowa. It was implemented towards the end of 1988 with the first credit provided to Phokoane farmers in October 1988. The first group of farmers also took part in the first extension and training programme during that year. In 1990 the FSP concept was also introduced to the community at Elandsfontein in the Kadishi valley. The FSP concept was also introduced to two other regions of Lebowa, i.e. Ndebele and Zebediela. Households surveys were conducted in the Phokoane area during April to June 1991. Information obtained from officials of the Lebowa Agricultural Corporation (LAC) and the extension officers involved in the Phokoane FSP was also used in the study.

3.2 The Phokoane FSP

Food security was identified as the basic need of the community in the Phokoane area. Increased maize yields was therefore regarded as the prime goal of the FSP in Phokoane. The urgency of food security superseded any long term ideals of promoting commercial farming. It was believed that improved food security through visible food production would

overcome suspicion and resistance to agricultural improvement efforts. Lack of knowledge was identified as the main obstacle inhibiting increased extension and training was therefore hypothesised to be the solution to the problem.

Extension and training became the main thrust of the FSP in Lebowa. Mechanisation and specific ploughing services, as well as agricultural inputs, were generally available and used in the rural areas of Lebowa. It was only crop production advice that was in short supply.

In the Phokoane area extension and training are provided to the farmers by the LAC training section consisting of two senior training officers and two extension officers seconded from the Lebowa Department of Agriculture (LDA). These four persons have, since the implementation of the programme, reached almost 4 000 households. Many of the farmers became members of the respective co-operatives only after completion of the training schedule. The training schedules are coordinated through the co-operatives. The extension officers also use the co-operatives as their "base". Training is given in the specific village or area of each farmer group.

The success of the training programme is evident from the increase in yields achieved by the majority of farmers who completed the training programme. The success of these farmers has resulted in an increase in demand for training. The expectation thus far created, however, could become a threat to the FSP in Lebowa as there is only limited manpower to provide the needed extension and training. This threat forced LAC to embark on a new initiative to train more officers for specific application in FSP areas. This is a pro-active measure in view of the intended implementation of the FSP in other areas of Lebowa which will put further strain on an already full training schedule. The number of farmers who attended training courses in the Phokoane area is indicated in Table 3.

Phase 1 consists of basic training, explaining the very basic principles of maize production, while Phase 2 consists of more advanced lectures, touching on elements of soil conservation, plant protection, finance, etc. The drop-out rate from Phase 1 to Phase 2 was 33 per cent.

Given that 89.2 per cent of respondents surveyed in Phokoane want to see the extension officer more often, it can be concluded that the demand for information remains high. Only 16.2 per cent of the respondents regarded extension services as unnecessary. This finding is supported by the high attendance in training courses, i.e. crop production (97.5%), soil conservation (97.5%), crop storage (96.1%), farm budgeting (95%) and livestock improvement (88.2%) (see Table 4). It was also determined that 87 per cent of the farmers in Phokoane regarded the quality of extension services as good to excellent. Many attributed their perceived success to the extension and training effort.

Virtually all the FSP farmers in Phokoane knew the local agricultural officer's name (FSP 91.7% and non-FSP 72.7%). The local agricultural officer visited FSP farmers on average 32 times per year, while the mean number of contacts with non-FSP members were 23 per year. Despite the high number of contacts, most of the respondents in the Phokoane region indicated that they would like to see the agricultural officers more often (36.1% of FSP and 18.2% of non-FSP households).

Phokoane FSP members also indicated that they could get access to information on ploughing, planting, fertilizing, weeding, pest control (all varying between 91.4 and 100%), animal production (28.6%) and dipping of animals (25.7%). However, the non-FSP members responded differently, indicating that access to information was more difficult for them than for the FSP members.

Table 3 : Number of farmers who have completed training courses at Phokoane, 1989/90 to 1992/93

Season	Phase 1	Phase 2
1989/90	48	
1990/91	814	
1991/92	460	640
1992/93	492	386

3.3 Contribution of extension and training to increased agricultural output

The yield difference between the FSP and non-FSP farmers at Phokoane (although significant) is, however, not on its own sufficient to conclude that the extension and training element of the FSP contributed to increased production. This was analysed further. Using the survey data of the Phokoane region, a discriminant analysis was undertaken to determine which factors are associated with surplus production. Households producing more than subsistence needs (1 ton or 14 bags of maize) and earning an income from maize production, were classified as surplus producers or emerging farmers. Results obtained from the discriminant analysis are presented in Table 5. The entries in the first column indicate the relative contribution of each variable to the discriminant function.

A highly significant factor discriminating between surplus and deficit producers was ownership of cattle by surplus producing farmers ($p = 0.0001$). The group means in Table 5 also indicate that deficit producers are more likely not to keep cattle ($p = 0.0073$). This variable gives an indication of wealth, implying that the surplus producers are relatively more wealthy and food secure, and do not depend solely on maize production for household food needs. This confirms to some degree the concern of analysts that only the more wealthy and the so-called rural elite participate in the FSP. The ownership of cattle furthermore implies that these households have liquid assets which could readily be sold in case of cash needs.

The analysis also showed extension and training to be associated with surplus production ($p = 0.0227$). There is a significant difference between surplus and deficit producers with regard to this variable, with surplus producers having a larger tendency to attend training courses. It could therefore be argued that the extension and training element of the FSP in Phokoane contributes to increased production (at least partially).

Table 4: Extension and training courses attended by respondents in Phokoane, 1990/91

Course attended	Percentage
Crop production course	97.5
Soil conservation course	97.5
Crop storage course	96.9
Livestock improvement course	88.2

The variable "level of training" refers to the different training courses offered through the FSP. The phase 1 training course was coded as 1, the phase 2 course as 2 and non-participants were coded as 0.

The group means in Table 5 indicate that surplus producers tended to have completed the phase 2 training course. In a further analysis it was found that the average yield of respondents with phase 1 training is 1.54 tons/ha and that of the respondents who have completed or are currently taking part in phase 2 training is 3.56 tons per hectare ($P=0.0011$). This provides further evidence that the FSP partially contributes to increased output. However, this could also be attributed thereto that the first farmers to join the FSP and the first to finish the second phase of training are all farming in the core region of Phokoane, which is known to have a high agriculture potential.

Other important discriminating factors were the use by surplus producing households of mechanical planting and intercropping on a smaller area.

Differences in group means between surplus and deficit producers were significant in both cases. These variables through the link with the mechanization and training elements of the FSP, provide further evidence that the FSP elements contributed to increased agricultural output.

The impact of the extension and training element of the FSP on agricultural output is further highlighted in a study of the yields of 1 200 Phokoane farmers by Adendorf (1992). The results of this study is summarised in Table 6.

Furthermore, Adendorf (1992) indicated the effect of training on the yields of one Phokoane farmer, confirming the results discussed above:

Before training :	1986	:1.4 t/ha (20 bags/ha)
	1987	:2.2 t/ha (32 bags/ha)
	1988	:2.1 t/ha (31 bags/ha)
After training :	1989	:2.5 t/ha (36 bags/ha)
	1990	:3.5 t/ha (51 bags/ha)
	1991	:4.2 t/ha (60 bags/ha)

Through the additional analysis and discussion above it can now be stated that the FSP in Lebowa (Phokoane), mainly through the provision of training and extension, has probably contributed to an increase in agricultural output.

4. CONCLUSION

This paper intended to evaluate the role and performance of the extension and training element of the FSP. Although the FSP as such did not provide
extension services per se but merely relied on existing services provided by Governments and development corporations, it is difficult to evaluate the "extension element" of the FSP. However, analysis of survey data from the FSPs in Venda and Lebowa made it possible to determine farmers' perceptions of the extension service as well as the possible contribution of a more coordinated and

Table 5 : Variables discriminating between deficit and surplus producers in Phokoane.

Discriminant variable	Standard discriminant function				Group means		
	Coefficient		Partial r^2	Significance (P < F)	Deficit farmer	Surplus farmer	Significance (P < t)
	Deficit	Surplus					
Own cattle	8.683	6.533	0.1790	0.0001	1.85 *	1.42 *	0.0073
Area intercrop	1.901	1.387	0.0633	0.0194	2.00	1.29	0.0000
Extension & training	7.381	5.266	0.0610	0.0227	1.25 *	1.06 *	0.0000
Level of training	0.373	1.322	0.0673	0.0172	1.65 #	1.83 #	0.0005
Mechanical Planting	7.775	5.353	0.0327	0.1040	1.22 *	1.06 *	0.0000

* = Indicates dummy variable with 1 = yes ; 2 = no.
\# = Phase 1 training course = 1 ; Phase 2 training course = 2 ; non-participant = 0.

Table 6: Increase in maize production at Phokoane as result of FSP training

Item	Before FSP (1990)	After FSP (1991) *
Average size of land	1.3 ha	1.3 ha
Average yield (70kg bags)	6.1 (0.4t/ha)	41.6 (2.9t/ha)
Annual home consumption (70kg bags)	14.5 (1.0t/ha)	14.5 (1.0 t/ha)
Average shortfall/surplus	(9.6)	24.0 (1.6 t/ha)

* After completion of the FSP Phase 1 training course.
Note: The climatic conditions of the two crop seasons did not differ dramatically. Thus the yield increase could be attributed to other factors.

directed extension and training effort to agricultural output.

The analysis reveals that only in Lebowa, of the two survey areas, the extension effort is clearly associated with increased agricultural output. The contribution of extension in Venda was not so clear. This could in the latter case partially be related to institutional problems for example, lack of coordination and general inefficiencies. Farmers' perceptions of the extension effort in Venda confirm this to some extent. These problems and inefficiencies can partially be related thereto that the implementing agent were not able to secure sole responsibility for the extension programme like in Lebowa. In Venda, Agriven and the Venda Department of Agriculture and Forestry had joint responsibility in the implementation of the FSP with the Department of Agriculture and Forestry being responsible for providing extension services.

The general conclusion is that extension and training play an important role in determining the success of FSPs. They are closely associated with increased production. However, to what extent it contributed towards increased production remains a point of contention. Some analysts and observers argue that only the rural elite has access to FSP related services. Results from these analyses, however, show that comparable households achieve higher yields when they get appropriate extension.

Training and extension thus at least partly contribute to higher maize yields in FSP areas.

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