A COMPARATIVE STUDY OF TWO AGRICULTURAL EXTENSION APPROACHES IN DODOMA REGION, TANZANIA

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ABSTRACT

The study compares two extension approaches; Sasakawa Global 2000 and the Training and Visit (T & V) as implemented in the field in Dodoma region Tanzania. Salient features of each approach are described and their strengths and weaknesses are revealed including the implications of having two extension approaches in one area. It is recommended that the successful elements of the approaches be combined to optimize program effectiveness and efficiency and beneficiaries should be involved in program decisions.

1. INTRODUCTION

Agricultural extension systems in many parts of the world have used different approaches. Each approach may be conceived as appropriate in particular circumstances and each has its own advantages and disadvantages. These approaches differ in terms of their organisational structure, resources of money, personnel and equipment, methods and techniques, program goals and kinds of leadership (Axinn, 1988).

Agricultural extension is essential to agricultural development, yet people have a wide range of views about the relative value of agricultural extension because it has been organised in different ways to pursue different objectives. These views range from very positive to negative depending upon each observer's knowledge and experience with agricultural extension.

In Tanzania agricultural extension services are organised under the Ministry of Agriculture. As with other public funded extension systems, the extension services in Tanzania have been criticised for not doing enough, not doing it well and for not being relevant. In an attempt to reform and improve upon the effectiveness of the conventional agricultural extension the government introduced the Training and Visit (T & V) System of Agricultural extension in 1989. T & V now covers 16 out of the 20 regions in Tanzania. The remaining 4

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regions commonly known as the Southern Highlands, operated under another project; Southern Highlands Extension Rural Financial Services Project.

2. THE TRAINING AND VISIT (T & V) SYSTEM

The Training and Visit System of agricultural extension was introduced to solve inherent problems in national agricultural extension organizations in developing countries. Swanson (1984 p. 9) enumerated some of the more important problems the T & V system attempted to solve.

a) to improve the organization of extension by introducing a single, direct line of technical support and administrative control,

b) to change the multi-purpose role of many extension workers to a clearly defined, single-purpose role(s) involving only education and communication activities,

c) to improve coverage by limiting the number of farm families or households one extension worker is expected to visit,

d) to improve mobility by providing appropriate transport, so each worker can regularly visit his/her contact farmers,

e) to improve each extension workers technical skills and knowledge about improved agricultural technology by providing regular in service-training sessions,

f) to improve extension ties with agricultural research through the addition of more subject matter specialists, who are expected to maintain regular contact with their research counterparts and to ensure a continuous flow of information that transmits technology to farmers and farmers' problems back ro research personnel,

g) to improve the status of extension personnel by giving them a relatively clear cut extension job with reasonable expectation that they can successfully carry it out; this will increase their level of respect in the community and begin to build their self confidence, and

h) to reduce the level of duplication of services that occurs when extension is fragmented among different ministries (for example, agriculture, livestock or forestry).

3. SASAKAWA GLOBAL 2000 (SG2000)

SG2000 began working within ministries of agriculture and farmers in selected African countries in 1986 (Dowswell, 1994). In Tanzania the SG2000 approach was introduced in Arusha, Dodoma, Iringa, Kilimanjaro, Mara, Mbeya and Rukwa regions. The T&V approach also operates in these regions. The major objective of the SG2000 approach is to introduce modern agriculture to cereal growers through the use of fertilisers, improved seed varieties and improved agronomic practices. Other objectives are:

a) to test and demonstrate improved food crop production technologies,

b) training activities of extension officers and farmers,

c) improving extension mobility by supplying transport facilities, and

d) to act as a catalyst for strengthening the linkage between farmers, agricultural research, extension and input suppliers.

The centrepiece of the SG2000 approach is the farmer managed technology evaluation and training plots called Management Training Plots (MTPs). According to Quinones *et al;* (1992) one of the main features of the MTPs package is the fact that it is easy for participating farmers to replicate. MTPs reflect a belief that small-scale farmers must be provided with opportunities to handle new practices under realistic circumstances (Dowswell, 1993). To provide a realistic demonstration of the possibilities with new technology, SG2000 believes that for cereal crops MTPs should occupy at least 0,25 ha and preferably 0.4 to 0.5 ha. These plot sizes allow the co-operating farmers to judge the resource requirements of the new practices and to realise an immediate and clear cut benefit from them.

SG2000 works with pilot farmers in the hope that new improved practices would be disseminated and copied by other farmers as they see improvements on the pilot farmers holdings. Participating farmers receive timely technical training and the necessary inputs to put into practice the entire package of recommended technology. Other technologies that SG2000 emphasise are the training of farmers and extension agents in post-harvest and grain storage as well as promoting greater use of animal traction.

4. OBJECTIVES OF THE STUDY

T & V and SG2000 agricultural extension approaches are perceived differently by farmers and extension agents because of the differences on the two approaches in terms of suitability, effectiveness etc. The extension agents who work with both T & V and SG2000 are the employees of the Ministry of Agriculture. Being the employees of the same ministry they face practical implementation problems on how to serve the same farmers using different approaches. This study was therefore aimed at assessing the perceptions of farmers and extension workers on T & V and SG2000 for the purpose of making recommendations for improving the agricultural extension services. The specific objectives are:

a) to describe the two approaches as implemented in the field,

b) to determine the perception of farmers on the effectiveness of the two approaches in meeting their farming needs and their appropriateness to farmers circumstances,

c) to determine extension workers perceptions as to the effectiveness of the two approaches

d) to identify the strengths and weaknesses of the two approaches based on the opinions of the farmers and extension agents.

5. METHODOLOGY

Ten villages where both T & V and SG2000 were operating were randomly selected in Mpwapwa district, Dodoma region. The target populations were farmers who were used as contact farmers or pilot farmers. Village roster constituted the sampling frame. Fifteen farmers were systematically selected from each village. All 20-village extension agents who were working with T & V and SG2000 from the district were selected. Data were collected using a questionnaire. The questionnaire was pretested in the target population. The enumerator interviewed farmers individually and recorded their responses in the relevant questionnaire. The extension agents were given the questionnaire and they filled it during their monthly meetings at the district headquarters.

Formal discussions were held with District and Regional Extension personnel to provide additional information. Other sources of information were obtained by reviewing reports and documents related to T & V and SG2000.

6. FINDINGS AND DISCUSSIONS

6.1 Description of the two approaches

The village extension agent in collaboration with village government leadership did the selection of contact farmers/pilot farmers in both T & V and SG2000. The selected farmers are expected to test new practices in their demonstration plots so that other farmers can copy from them. One of the disadvantages of this selection procedure is that often better educated, more open to new information and wealthier farmers are selected. On the other hand rarely will women farmers be selected, both the extension agents and the village government leadership are predominantly males.

6.2 Advice given by the two approaches

Nearly 95 percent of the farmers claimed that the T & V advice concentrated on the use of farm yard manure and cultural practices. On the other hand 94 percent of the farmers indicated that SG2000 concentrated its advice on purchased inputs and cultural practices. Both approaches realise the need for farmers to follow good cultural practices.

SG2000 is criticised in that, by encouraging use of fertilisers and pesticides it is encouraging environmental pollution. According to Quinones *et al;* 1992 encouraging farmers to use fertilisers will help to restore soil fertility and stop traditional shifting cultivation still practised by farmers which contributes to environmental degradation particularly soil erosion and desertification. Dowswell & Borlaug (1991), asserted that properly applied chemical fertilisers do not harm the soil instead they help conserve the environment. Deny farmers fertilisers and crop protection chemicals and they will be doomed not from poisoning as some say but from starvation and social chaos (Borlaug 1994). One of the advantages of the advice given by SG2000 is the quickness to make improvement on farming practices and observe results, specifically increase in yields per area which may convince farmers more easily to adopt new technology.

6.3 Source of technical packages

The sources of impact points for T & V are the bimonthly workshops in which subject matter specialists meet with extension agents. They review the performance of the past impact points delivered to the farmers and prepare technical packages to be given to farmers by the extension agents. In SG2000, the main source of technical packages is the training provided at the onset of

the season. Village extension agents and researchers meet and review past season activities. They then discuss strategies and technical packages to be stressed in the following season. The technology applied in MPT's has generally been investigated in on farm trials and found to be acceptable to farmers and effective in addressing their most important production constraints. In both T & V and SG2000 farmer's involvement in generating technical packages is minimal.

6.4 Extension teaching methods

Extension teaching methods employed by the two approaches are; individual, group and mass. However it was found that there was wide use of mass teaching methods in SG2000.

Table 1: Extension teaching methods employed by T & V and SG2000

Method	T & V	Percentage of respondents SG2000
Individual	74.7	52.0
Group	24.0	30.0
Mass	1.3	18.0

In the T & V use of mass method was found to be very little (Table 1). Swanson & Claar (1984) also reported lack of effective use of mass media methods of communication as one of the major short comings of T & V. Generally there was more use of individual methods than group or mass media by the two approaches.

6.5 Demonstration plot sizes

Demonstration plots used by T & V range in size from 50 square metres to 500 square metres. About 66 percent of the respondents argued that the plot sizes employed by the T & V were too small to provide a realistic test of the improved practices and that such sizes are ideal for researchers. When asked to comment on plot sizes used under SG2000, ninety percent of the respondents showed satisfaction with the size. Seven percent said that the size was too big to manage and about three percent wanted to have bigger plots than the present ones. Under T & V farmers are required to test a new technology on a small part of the farm without inputs being provided. From such small plots farmers cannot easily extrapolate the yield benefits they would get by applying the recommendations on a larger scale. Under the SG2000 approach larger size farmer managed demonstration plots have a

psychological impact on production gains which help to convince farmers to be enthusiastic promoters of the new technology.

6.6 Input supply

The SG2000 approach in contrast to T & V offers farmers something more concrete by providing them with inputs and training they need to apply new technology on a commercial scale. Provision of inputs in transferring improved technologies to small-scale farmers in T & V is non existent.

7. PERCEPTION OF FARMERS ON THE EFFECTIVENESS OF THE TWO APPROACHES IN MEETING THEIR NEEDS

7.1 Effect on production

Among the determinants of the effectiveness of an extension approach is the extent to which farmers increase production from their farms. In the study about 48 percent of the surveyed farmers agreed that the SG2000 approach helped them to increase production than the T & V approach. According to Quinones *et al;* (1992) and Dowswell (1993) the SG2000 extension approach helped farmers to increase yields of maize, sorghum and wheat to about four folds compared to yields farmers used to get before the introduction of SG2000 in Tanzania. However there were no records of yields available for T & V approach. Higher yields were obtained in SG2000 because of the input package supplied to farmers. Forty percent of the farmers agreed that the T & V approach helped them to increase production just like SG2000. In general the two approaches helped farmers to increase yields but higher yields were realised in SG2000. Evidence of SG2000 extension approaches helping farmers to increase yields has also been reported (Borlaug, 1989; Daily News July, 29, 1990; Quinones *et al;* 1992 Dowswell, 1993; Daily News May 31, 1994; Idatchaba *et al.,* 1994 and Makweta, 1994).

7.2 Compatibility of advice given

Sixty nine percent of the farmers were of the opinion that the two approaches gave them advice that complies with their social cultural circumstances. The advice given was mainly on crops and livestock. One of the packages being promoted by both T & V and SG2000 is the production of a sorghum variety called Tegemeo. Sorghum is grown in many parts of Dodoma. Although Tegemeo is not highly marketable it is a crop that is drought resistant and assures farmers of food availability in the area. Traditionally, the surveyed farmers keep cattle and some of them have been using oxen for ploughing

before the introduction of T & V and SG2000. Therefore advising farmers on use of oxen is not an alien package but a way of helping them take advantage of the cattle kept.

Compatibility with the post harvest packages was however doubtful. Farmers have been advised to construct grain storage baskets with drying floors that are plastered with sand-cementing mixtures. Farmers have limited access to cement and the use of cement is not a normal practice. They are used to plastering floors and walls of their houses using fresh cowdung.

7.3 Difficulties farmers faced by being served by T & V and SG2000

Thirty three percent of farmers (Table 2) indicated that training sessions for T & V and SG2000 were held at different times. They were required to spare time to attend training for each approach. They suggested that training could be done together as the technical packages were almost the same. Eight percent of the farmers had difficulties in setting demonstration plots required for each approach. In most cases T & V and SG2000 demanded farmers to establish the plots in places that are easily accessible preferably near the roads. It was not always possible for farmers to have enough good land to put to plots on the preferred sites.

Table 2: Difficulties faced by farmers for being served by T & V and SG2000

Difficulties	Frequency	Percentage
Time for training	50	33.3
Failure to decide	32	21.4
No difficulty	28	8.6
Different Spacing recommendation	27	18.1
Plot location	13	8.6

Twenty one percent of the farmers failed to decide which of the two approaches is more effective in improving their agricultural development. Since the two approaches work on similar crops; maize and sorghum it would have been wise for the two approaches to agree on similar spacing to be used by farmers in order to avoid creating difficulties for farmers in deciding which spacing is more profitable. Eighteen percent of the farmers reported to have failed to decide which of the spacing is profitable.

8. EXTENSION WORKERS' PERCEPTION OF THE EFFECTIVENESS OF THE TWO APPROACHES

8.1 Practical difficulties faced by Village Extension Workers in working with the two approaches

In the T & V approach spacing recommendation for maize was usually 30 cm by 90 cm - one plant per hill. Farmers argued that SG2000 recommended 50 cm by 80 cm spacing was wider and needed much less labour; it also assured farmers of optimum plant population and therefore high production per unit area. By using 30 cm by 90 cm spacing a farmer need to dig 37, 037 holes in one ha. By using 50 cm by 80 cm a farmer need to dig 25,000 holes, therefore less labour. A spacing of 50 cm x 80 cm has an added advantage for ox-weeding as most of the ox-weeding tools can be easily adjusted in the 80 cm row spacing. Forty percent of village extension agents had problems of explaining the difference in spacing in the two approaches. The spacing advocated by SG2000 assure farmers to have optimum plant population and less labour in digging planting holes. In SG2000 farmers were offered inputs to test the recommended technologies. But in T & V farmers were not given loan inputs. Therefore farmers perceived the T & V as an ineffective approach because the village extension agents had to tell them there were no inputs packages in the T & V approach.

8.2 Role of extension agents

In the T & V approach the main roles of village extension agents are to identify farmers problems, training and visiting them, give advice, assess performance and to link with research. This is in line with the fundamentals of T & V as stipulated by Benor (1987) and Benor & Cleaver (1989). In SG2000 extension agents performed the above functions but in addition they were involved in input distribution and loan collection from the participating farmers.

T & V proponent argued that extension workers should not be involved in the disbursement of inputs or credit handling to farmers nor in marketing. These activities might divert extension agents from the diffusion of technical information and lead to conflict of interest with their farm clients. SG2000 believes that village extension agents must play some non-educational roles because other complementary institutions are lacking or inefficient. Lack of complementary factors of production such as credit, input and reliable markets have been cited as serious constraints to the successful implementation of T & V (Mollel, 1986, Mattee, 1989 and Mattee, 1994). Forty five

percent of the extension agents under SG2000 who were involved in input distribution stated that their quality of work and confidence have increased. This is because when they were advising farmers to use improved seed or chemicals and bringing these inputs with them, it eased the training and understanding. Thirty five percent of the extension agents said that dealing with inputs helped them to create and increase a sense of responsibility since they were entrusted to handle inputs which cost several times their salary. Concerning effect on work quality, 85% of those involved in loan collection from farmers said that it raised their accountability, thirty percent said it led to a conflict of interests with farmers who failed or refused to pay back the loan.

8.3 Logistical support provided by T & V and SG2000

T & V provided transport and working tools to its extension agents. District and divisional officers were provided with motorcycles while village extension agents were given bicycles. Similarly SG2000 provided bicycles to the village extension agents and motorcycles for the district supervisors. In addition T & V provided soil test kits, rain coats, field bags and gumboots. T & V provided houses to divisional extension officers. In conclusion T & V provided more logistical support than SG2000.

9. STRENGTHS AND WEAKNESSES FOUND IN THE TWO APPROACHES

9.1 Strengths found in T & V

Farmers reported regular visits by the extension agents and emphasis on use of farm manure as major strengths of the T & V. Frequent training of village extension agents who then communicate the ideas to farmers by visiting them regularly is the main feature of T & V. Advise on crops as well as livestock is also considered as strength of T & V.

9.2 Weaknesses found in T & V

Weaknesses found in T & V are given in Table 3.

Although T & V believe that a tight schedule of training and visits will automatically improve the effectiveness of the extension services, the schedules were not followed as expected. T & V also advocate regular supervision of farmers and extension agents. Field visits cannot be implemented if there are no regular flow of services; fuel and allowances

must be assured. Extension agents reported that there was irregular flow of funds, spares and fuel that affected supervision schedules. Poor supervision in T & V has also been reported in the past (Swanson & Claar, 1994; Mattee, 1994; Mollel, 1986; Benor, 1987 and Bindlish & Evenson 1993).

Table 3: Weaknesses found in T & V

Weaknesses	Percentage of respondents Farmers	Village Extension Agents
Lack of Inputs	40.3	30.0
Poor Supervision	30.9	25.0
Fixed Schedule	28.8	45.0

Some Village extension workers regard the T & V as being carried at a very high cost. Earlier criticism of T & V on the high recurrent expenditure, which it requires and the possibility that most countries will never be able to sustain the necessary level of financial commitment when donor funds terminate has been, cited (Howell, 1984; Roberts, 1989 and Mattee, 1994). Although T & V put much emphasis on use of farm manure rather than chemical inputs it does not give farmers logistical help to ferry the bulk manure to their fields.

9.3 Strengths found in SG2000

The strengths found in SG2000 are shown in Table 4. Effective supervision increases contact between farmers and extension officers. It also helps to get quick feedback and give possible solutions to problems before it is too late. District supervisors on a regular basis supervise village extension agents. Availability of transport ensures that farmers are visited. The regional co-ordinators are provided with four-wheel traction pick up trucks, district supervisors with off-road motorcycles and bicycles for village extension agents. The running costs and maintenance are met by SG2000. Low bureaucracy reduces delays in communication and improves efficiency of the extension approach.

9.4 Weaknesses found in SG2000

Both farmers and extension agents consider uniform, recommendations, involvement of village extension agents in input distribution and lack of markets as weaknesses in SG2000 approach (Table 5). Recommendation offered to farmers is general and not specific. They do not take into account variations in soil types, economic levels of farmers nor labour availability. Whereas farmers in the region grow different crops, the SG2000 approach

concentrates its advice on sorghum and maize. Advice on livestock is limited to oxenisation.

Table 4: Strengths found in SG2000

Strength	Percentage of respondents Farmers	Village Extension Agents
Yield increase	84.0	90.0
Input package	69.0	70.0
Effective supervision	67.4	80.0
Transport Facilities	n.a.	95.0
Low bureaucracy	n.a	70.0

Table 5: Weaknesses found in SG2000

Weaknesses	**Percentage of respondents farmers**	**Village extension agents**
No weakness	51.0	n.a.
Uniform recommendtion	27.5	30.0
Lack of market	21.5	25.0
Loan collection	n.a.	45.0

Involvement of extension agents in loan recovery from farmers resulted into poor co-operation with contact farmers particularly those who failed to payback the costs of inputs advanced to them. Poor loan recovery was normally experienced in years of bad weather in which farmers do not harvest enough.

Formal discussions between the researcher and the agricultural personnel revealed that farmers would have benefited more from the SG2000 approach if it considered market development (for sorghum) hand in hand with emphasis on technology that resulted to higher production. Where farmers failed to sell the surplus produce or sold it at non profit prices there was also non-loan recovery. It is interesting to note that 51 percent of farmers did not see any weaknesses in SG2000.

10. CONCLUSIONS AND RECOMMENDATIONS

The effectiveness of an extension approach is determined by the extent to which it can help farmers to increase yields, respond to the needs of farmers and compatibility of advice to the farmers circumstances. T & V and SG2000

extension approaches were found to comply with these conditions to a great extend. SG2000 however needs to review its post harvest package.

Use of different extension approaches in the same area at the same time for same impact points creates practical difficulties for the extension workers and farmers who implement the activities of the two approaches. It may also result in duplication of efforts and resources.

The two approaches should combine their resources and work as one extension approach. The elements to be included in the joint approach should include: presence of adequate supervision, provision of adequate logistic support to the field staff and it should be less bureaucratic. The approach should co-ordinate with complementary institutions such as input suppliers, marketing and credit systems to ensure improvement in extension services go hand in hand with improvement in availability of other supporting factors.

The SG 2000 extension approach was perceived more effective than T & V. The reasons were input package, effective supervision, low bureaucracy and increased production. Both approaches were deficient in the involvement of farmers in technology generation. Mechanisms to involve farmers in the technology development process need to be investigated.

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