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THE AGRICULTURAL EXTENSION SERVICE
IN PAPUA NEW GUINEA.

Can we make it more effective?

Robert F. McKillop

EXTENSION
BULLETIN

No. 5

Extension bulletins are published to provide field officers with information on particular applications of extension techniques in Papua New Guinea. Bulletins contain case studies of development projects, reports of field studies and extension research projects, and discussions of the basic principles of extension work.

Views expressed in these Bulletins are those of the authors and are not necessarily supported by D.A.S.F.

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DEPARTMENT OF AGRICULTURE STOCK AND FISHERIES

**THE AGRICULTURAL EXTENSION SERVICE IN
PAPUA NEW GUINEA**

CAN WE MAKE IT MORE EFFECTIVE?

**Robert F. McKillop
Rural Development Officer**

EXTENSION BULLETIN NO. 5

**DEPARTMENT OF AGRICULTURE, STOCK AND FISHERIES
PORT MORESBY
PAPUA NEW GUINEA**

MAY, 1974

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ABSTRACT

This Bulletin reports on a survey of agricultural extension agents employed by the Department of Agriculture, Stock and Fisheries in Papua New Guinea. The first part of the report deals with the agents own concept of their role, the activities they undertake and the major problems which they face. The findings of the second part of the survey are summarised and suggestions made for the improved effectiveness of the agricultural extension service.

Part II of the Bulletin goes into more details on the methods used in the survey to measure extension skill and related factors. A statistical analysis of the survey results is included. This shows that personality factors related to organisational environment, namely a high professional orientation and low orientation toward bureaucratic procedures and behaviour are the most important factors contributing to extension skill.

THE AGRICULTURAL EXTENSION SERVICES IN PAPUA NEW GUINEA

PART I

THE MAJOR PROBLEMS FACING THE EXTENSION AGENT

I. INTRODUCTION.

In November 1972 the Papua New Guinea Government announced new policy guidelines for the future development of the country. These guidelines, widely known as the 'Eight Point Improvement Plan' were based on three central themes - rural improvement, decentralisation and equality. The new policies involve a change in emphasis from development based essentially on economic criteria toward total human development where social, political, spiritual and economic aspects are given equal emphasis.

The change in emphasis toward a more integrated approach and rural development in general calls attention to the ability of the Government to implement its policies. Essentially we have to ask how well can the type of organisations or agencies that the Government has achieve the new policies?

We need to ask this question because the organisations now existing in Papua New Guinea were modelled on those of a metropolitan country (Australia). In other countries which have been colonies like Papua New Guinea people are becoming concerned that the organisations which have been inherited from the metropolitan country are not helping them to develop their countries very well. Some of the reasons for this are:

(i) The organisations (eg. departments) were set up to achieve the goals of the colonial country. With independence the goals for the different organisations change. The sort of organisation which can achieve one set of goals very well will not necessarily be the best type of organisation for a different set of goals. Often the government creates new organisations to implement its policies and counter existing departments. This means many organisations are only working against each other.

(ii) The government organisations are only a few of a very wide range of complex organisations that exist in industrial societies. Here there is a balance between private and public organisations and each organisation has to continually change its goals to adapt itself to changes in the environment. In developing countries however, public organisations have been created where private organisations are only poorly established. In these countries the central government organisation dominates the employment opportunities and organisational initiative (Ness, 1967). This means that skilled manpower goes to government departments and agencies. These agencies are not usually employed in production activities. The government has to use its organisations to try and stimulate development. This means that the government is trying to "push" development. The rural people often react against this pushing. Also they have difficulty developing their own projects because most skilled manpower is drained off into government service.

In Papua New Guinea employment opportunities are very strongly dominated by the central government. In 1973 85.2% of professional and sub-professional manpower and 66.6% of technical manpower was employed in the public sector (Manpower Planning Unit 1973).

(iii) Some people (Ballard 1973) say that the public organisations in Papua New Guinea are more fragmented than in other newly independent states because of the Australian model adopted here. This model demanded high levels of expertise and detailed central controls. Many central departments and statutory boards were formed. This has made co-ordination difficult especially at field level.

This Bulletin will examine one aspect of the effectiveness of government services and attempt to define some of the main problems. It will examine the agricultural extension service from the point of view of the extension agents themselves. The preceeding Bulletin (Tovue, 1974) has detailed some of the problems of the extension service from the farmers' point of view.

II. THE AGRICULTURAL EXTENSION SERVICE IN PAPUA NEW GUINEA

The most important organisation providing agricultural extension services in PNG is the Rural Development arm of the Department of Agriculture, Stock and Fisheries. However, there are a wide range of organisations and agencies providing extension services to rural communities including other branches of D.A.S.F.. A list of these is given in the following table.

TABLE 1

RURAL EXTENSION AGENCIES IN PAPUA NEW GUINEA

Activity	Agency	Remarks
Agricultural extension	Department of Agriculture, Stock & Fisheries (D.A.S.F. Rural Development) Division of District Administration (D.D.A.) D.A.S.F. (Animal Industry) Missions/Young Farmers Gps. D.A.S.F. (Research & Surveys)	Services in remote areas Livestock Extension Extension to plantation sector.
Health education	Public Health Department/Missions/Local Government Councils	Some agricultural projects.
Formal education	Dept. Education/Missions	Agriculture in primary schools farm training at vocational centres
Adult education	Dept. of Education (Adult Education)	
Political education	D.D.A.	Many agricultural projects.
Local Government	D.D.A.	Rural Development Funds
Land Reform	D.D.A./ Dept. of Lands - Lands Title Commission	
Cooperative extension	Business Development (Co-op)	
Business advisory service	Business Development (Business Extension)	
Forestry Development	Dept. of Forests/Business Development	
Rural Extension	Dept. of Information & Extension Services (Extension Services)	
Rural broadcasts	National Broadcasting Service	
"Community development"	Social Development & Home Affairs	Largely welfare work
Marketing	Various Marketing Boards	Publicity campaigns.
Rural Credit	Papua New Guinea Development Bank	Through D.A.S.F. Agents.
Training	University of Papua New Guinea/University of Technology	Practical village field work for University students.
	Volunteer agencies/ Australian Volunteer Association Canadian University Students Overseas Volunteer Service Overseas.	

Table 1 suggests that there is excessive specialisation, duplication and fragmentation of the rural development effort. The effects of this in creating organisational conflict will be examined later in the Bulletin.

The Rural Development Service of D.A.S.F. is structured on a regional district and sub-district basis. In each of four Regions all branches of the Department are co-ordinated under a Regional Controller. In each of the nineteen (19) Districts the Rural Development Branch is headed by a District Rural Development Officer. Agricultural extension staff are based at some 210 sub-district centres, patrol posts, agricultural stations and special project areas. At the time of writing these officers comprised both national public servants and overseas officers employed by the Australian Staffing Assistance Group (A.S.A.G.). At the 1st December, 1973 the Rural Development Service comprised the following staff:-

	<u>Public Servant</u>	<u>A.S.A.G.</u>
Rural Development Officer (Degree)	-	35
Rural Development Officer (Diploma)	52	104
Rural Development Technician (Certificate)	207	32
Rural Development Assistant	<u>826</u>	<u>-</u>
	1085	171

Of these staff Rural Development Officers and some experienced Rural Development Technicians carry out extension functions (see below) and the remainder are engaged in supervisory and servicing functions.

III. EXTENSION STRATEGY

The Rural Development Service aims to provide technical supervision, information and assistance to help farmers adopt the methods which will result in a speedy, but planned increase in the quantity, quality and variety of agricultural and fisheries products. The extension strategy adopted to achieve this is officially a democratic one where rural communities are actively involved in deciding their own development plans. The emphasis is on "self-help" in accordance with the Government's policy guidelines. This approach is opposed to a directive or "centralised planning" approach where rural people are told the things they should do to meet the aims of the government. With a democratic extension strategy the extension agent needs to deal with the community or the individual farm as a whole. He or she needs to be skilled in understanding the people he is dealing with, their problems and their desires, he needs to be able to advise them in a wide range of technical problems and he needs to be skilled in analysing costs and benefits of different alternatives

according to the criteria of the people themselves. In other words official democratic whole-farm extension approach adopted by D.A.S.F. requires skilled agents.

There is considerable doubt that field staff follow the official extension methods. ToVue (1974) has reported a widespread feeling among farmers that they are being directed rather than advised by the extension agents. Case studies of development projects in Papua New Guinea reveal that the important decisions are being made by government officials without community involvement. Among the best documented cases are the Mekeo Rice Scheme (Jeffreys, 1973) and the Highlands pyrethrum 'pushes' (Scoullar, 1973).

There is some evidence that present efforts in agricultural extension are not very effective. All the twelve (12) workshop groups (some 75 field officers) which participated in the current study agreed that the service was not effectively achieving its goals. A visiting study mission (Faber *et. al.*, 1973) commented adversely on the effectiveness of agricultural extension in Papua New Guinea. These views are backed by the financial return to expenditure on agricultural extension. In 1973-74 55% of D.A.S.F. staff were directly employed in agricultural extension duties. The cost of providing these services is approximately \$A6 million. The rate of increase in agricultural production hardly justified such expenditure. Between 1970-71 and 1971-72, the latest figures available, the value of indigenous production of the major crops actually fell. On a price adjusted basis the increase in production was only \$A2 million (see Appendix I).

This relative ineffectiveness of the agricultural extension service is not confined to Papua New Guinea. Watts (1973), Leonard (1972), Ascroft *et. al.* (1972) and Hatfield (1972) have reported similar shortcomings in Africa as has Clemente (1971) in the Philippines.

What are the reasons for the failure of agricultural extension services to achieve better results?

This study aims to define these problems, but firstly we will briefly examine what other people have already found. Various researchers in this field have listed the following problem areas:

(i) Lack of Technical and Extension Skill

As discussed above the democratic integrated extension approach demands highly skilled agents. If the agents do not have sufficient ability then they tend to fall back on a more directive approach (Thompson, 1961). In Africa it has been shown (Hatfield, 1972) that low level unskilled agents tend to rely on the authority of their position

to demand responses from rural clients. In Papua New Guinea the existence of a large number of unskilled Rural Development Assistants in the extension service faces the extension agent with the task of keeping these people employed. As the agents tend to see the organisation emphasising physical achievements it is tempting to use their assistance in doing things for the farmer.

The improvement of skills through training is the conventional solution to the problem of extension ineffectiveness. The current study attempts to record the awareness of extension agents to the need for increased skills and to determine to what extent further education and training increased the effectiveness of individual agents.

(ii) Changes in Policy of Extension Strategy

People have different ideas of what we mean by agricultural extension. As new principles are developed from research into extension problems the idea of what agricultural extension is, becomes more general and more complex. Because the development of extension principles has occurred very quickly many people still think of extension in the terms that were in use some years ago. In the early history of extension services their role was seen as providing a channel of communication for information to reach the farmers. When this approach failed to achieve the expected results research began to look for reasons. One important area of research in this era was 'diffusion research'. This theory was based on the idea that there were a group of progressive farmers who adopted new ideas and that these ideas would gradually diffuse through the whole community. Influenced by this theory extension services followed a 'progressive farmer' strategy (Watts, 1973). This meant the close involvement with individual farmers to get them to adopt desired practices. Unfortunately the research into 'diffuse theory' was mostly done in advanced countries and when these methods were applied in developing countries the results were not very successful (Watts, 1973; Leonard, 1972; Ascroft, 1972). In the short term such policies have been shown to create poverty in rural communities. Because of these problems recent research has come to emphasise the need for an integrated extension approach to the whole community with teams of highly trained extension workers combining together to tackle all aspects of community life.

The current study aimed to collect the ideas of extension officers on how they saw the aims of agricultural extension and then relate these views to the official aims of the Rural Development Service.

(iii) Organisational Problems

One important reason why extension agents tend to be directive rather than democratic is because of the type of organisation they work in. If we are going to have a large organisation with lots of people working together toward the same goal then it is necessary to define specific duties for each individual person and to co-ordinate these duties toward a common end. To get this co-ordination it is necessary to have a hierarchy of power so that those at the top can tell those below them what to do. We call such organisations bureaucracies. Bureaucracies are very effective in obtaining productivity and control - they are very poor in finding new ways of doing things (Thompson, 1965). Most agricultural extension services are run by public service departments, which are bureaucratic organisations. Within these organisations the only legitimate authority comes from the top. Thus the extension agent is told to do things by his boss. Usually the agent extends the same type of behaviour to the client (farmer) and tells him what he should do. Further, in large bureaucratic organisations it becomes necessary to measure achievement against physical goals (extrinsic criteria) such as acres planted, cattle distributed, number of new projects started or number of credit loans processed (Thompson, 1965). This further increased the temptation for the extension agent to get things done himself rather than taking the time to involve the farmer. The agent comes to place the organisations' goals above those of the farmer (client) (Watts, 1973).

A further organisational problem arises from the fact that more than one organisation is involved in rural development. While bureaucratic organisations are good at orientating those within the organisation to its goals, this means that where people from different organisations are working side by side they will be working for different goals. In Papua New Guinea where there are a large number of departments and agencies involved in rural development the potential for conflict between agents from these in the field is very high (Conyers, 1974).

The degree to which these organisational aspects restrict the effectiveness of the extension service is the main area of concern for this study. The reaction of extension agents to inter-departmental conflict and to organisational rewards are recorded and a measurement is made of the effect of bureaucratic and client orientation on extension skill.

IV. THE PRESENT STUDY

The study aimed to examine the above problems faced by the agricultural extension service in Papua New Guinea as seen from the extension agent's point of view. Group discussions in small groups and a mailed questionnaire were used. Details of the methodology and analysis employed is given in greater detail in PART II of this Bulletin for those who wish to pursue these details further. The following discussion summarises these issues and then gives a detailed discussion of the results.

1. METHODS

(a) Discussion Workshops: Workshops were held with field staff on four separate occasions. Twelve separate small groups comprising 75 extension agents discussed the following topics:

- (i) What is the role of the agricultural extension worker?
- (ii) Are we achieving our aims in agricultural extension?
- (iii) What can we do to make agricultural extension more effective?
- (iv) How can we better evaluate the work of an agricultural extension agent?

(b) Mailed Survey: Questionnaires were mailed to all agricultural extension agents in Papua New Guinea working at the field level. There were 102 national public servants and 99 A.S.A.G. officers. 113 (55%) were returned of which 10 were excluded from analysis because they were not completed correctly. The questionnaire consisted of two parts:

- (i) Open questions on the aims of agricultural extension; problems faced by extension agents; agents' ideas on what assessment criteria are used and should be used; and suggestions for the future development of the extension service.
- (ii) Structured questions aimed at obtaining measurements of the variables listed below.

2. VARIABLES MEASURED

- (a) Index of Extension Skill - a measurement of the individual agent's skill in agricultural extension.
- (b) Bureaucratic Orientation - a measurement of how strongly the individual agent favours kinds of behaviour that are normally fostered and rewarded in bureaucratic organisations.
- (c) Professional Orientation - a measurement of how strongly the individual agent favours behaviour which is normally considered to be professional (see Part II).
- (d) Role Conflict - measurement of the amount of conflict the agent feels between what he feels he should do as an extension officer and

what is doing now working for a large organisation.

- (e) Dissatisfaction Index - a measure of how unhappy an agent is with the reward policies of his organisation - eg. promotion.
- (f) Race - ie, a local or an overseas officer.
- (g) Agricultural Education - the number of years of tertiary agricultural training received.
- (h) Extension Training - whether or not the agent has received special training in extension techniques.
- (i) Service - the number of years of service in agricultural extension duties.

3. RESULTS

(a) What are the Aims of Agricultural Extension?

The views of extension agents on the aims of agricultural extension fall into three distinct categories:

- (i) As a passive channel of communication to farmers. This corresponds to the early historical role of extension services. The following kinds of answers were placed in this category:
 - "to pass information of new ways onto people"
 - "a bridge between farmers and sources of information"
 - "a communication channel between Headquarters, research etc. and farmers"
- (ii) A directive approach to farmers which tells them what is good for them. The following kinds of answers were placed in this category:-
 - "To get villagers to change their way of living"
 - "To change the ideas and ways of village people"
 - "To increase people's incomes (unfortunately they waste it)"
 - "To bring change to the standard of living of people"
- (iii) A democratic approach integrating all aspects of human development. The following kinds of answer were placed in this category:-
 - "To meet the needs of people as seen by the people themselves"
 - "Promote better opportunities for self-satisfaction"
 - "By working alongside people using their objectives, their programmes and their methods to lead them to creative thinking, to improve their standard of agriculture and to develop an awareness of ways other than their own"
 - "To stimulate people to decide for themselves about ways of improving their agriculture"
- (iv) Some responses could not be categorised under a single one of these headings.

The number of responses in the different categories was:-

PLATE I

Extension Officer discussing land preparation with a rice farmer in the Sepik District.

There is always a tendency for extension agents to get tied up with more routine duties rather than tackling more innovative tasks such as farmer training

Office of Information

Plate II

Extension officer leaving a project after a brief visit.

Does the increased mobility which motor vehicles make possible actually result in loss of communication with village people?

Many farmers come to see the extension agent as someone hopping into and out of vehicles or speeding past and showering them with dust.

Office of Information



(i) Communication channel	21
(ii) Directive	46
(iii) Democratic	25
(iv) Not categorised	18

Thus only a minority of extension agents see the aims of agricultural extension along similar lines to the official policy. However, we do not have similar figures from other extension services for comparison. It is likely that the proportion of extension workers who saw their role as a directive one is not high compared with other services.

(b) What do Extension Agents Do?

The questionnaires asked officers to record estimates of the time they spent on each of twelve different activities normally undertaken by extension agents. These activities were classified after Woeste (1969) according to whether or not the main decisions involved in the activity are routine (everyday) decisions or innovative (problem solving) decisions. As a check on the estimates given of time spent on different activities a number of agents were asked separately to keep daily time checks on their activities over a two month period. Unfortunately only 10 officers completed this exercise. Because of the small size of the sample who completed actual returns the conclusions from this information must be tentative. If this sample is a representative one then the results give some very interesting information.

First there is the large amount of time actually spent in travelling. Officers tend to underestimate this - probably many allocate the time travelling to various activities eg. to farm visits or farmer meetings. One way of looking at this is to say that it reflects the problem of physical communications in Papua New Guinea. Many extension agents have to cover large areas where the only means of communication is by walking or canoe. However, this is not borne out if we look at how the travel time is spent. 58.4% of travel time was spent in motor vehicles, 24% in boats, 1.2% in aircraft and only 12.4% walking. What seems to be happening here is a good example of what Ivan Illich (1973) told us about a couple of years ago. He said that in a society where vehicles were introduced which can move at a speed greater than 25 m.p.h. the amount of time which the population spends sitting in the means of transportation and being on the move increased. The current study suggests that with better roads and vehicles extension agents are spending more time sitting in the means of transportation.

TABLE II
% OF TIME DEVOTED TO TWELVE ACTIVITIES

ACTIVITY	A.S.A.G.	PUBLIC SERVANTS	
	Officers Estimated n=46	Estimated n=57	Actual n=10
A. INNOVATIVE ACTIVITIES			
(i) Planning and Programming	6.5	9.5	5.3
(ii) Farmer Meetings	9.8	7.6	3.9
(iii) Training Farmers	11.3	9.0	5.0
(iv) Training Staff	5.0	6.0	1.7
(v) Collecting Information for Problem Solving	6.2	5.9	1.5
(vi) Mass Media	0.7	1.8	0
SUB TOTAL	39.5	39.8	17.4
B ROUTINE ACTIVITY			
(i) Administrative admin. returns letter writing, rural credit applications, staff supervis.	13.1	14.5	30.0
(ii) In Office interviews with farmers and visitors	10.0	8.5	3.7
(iii) Farm visits for supervision of rural credit	16.2	18.5	10.4
(iv) Formal Meetings - staff, Council, etc.	4.1	5.1	5.0
SUB TOTAL	43.4	46.6	49.1
C OTHER			
(i) Travel-road, sea, air and walking	10.6	7.3	27.3
(ii) Other activities not listed above	9.8	7.0	5.4
SUB TOTAL	20.40	14.3	32.7
% of OFFICERS WHO:-			
(i) Conduct Regular Farmer Meetings	41.3	15.8	30.0
(ii) Meet with farmers in "Farmer Time" ie. night & week-ends	26.1	26.3	40.0
(iii) Regularly work closely with other departments	20.0	30.0	n.a.

Farmers interviewed by ToVue (1974) often complained bitterly that extension agents no longer spent long enough sitting down with them to explain things properly, but ran around in motor vehicles most of the time, stopping only long enough to abuse them for poor performance. There seems to be some truth in the charge. With improved means of transport extension agents seem to be taking the opportunity to switch to a more supervisory role which means shorter visits to more people. In addition, with greater freedom of transportation more extension agents are being posted to larger urban centres making it necessary to spend more time travelling out to rural areas.

Secondly, the trend to a supervisory rather than an advisory role is being accelerated by pressures for supervised credit. Those extension agents returning questionnaires from throughout the country admitted to spending at least 25% of their time on supervised credit - the small sample of actual time spent suggests that this may be underestimated. This would be fine if credit was the major limiting factor to rural development. In Papua New Guinea however, the critical limiting factor is managerial skill. The extension approach required to develop this skill requires farmer involvement in decision making (eg. structured problem solving group exercises) and emphasis on farmer training. However, when faced with innovative and routine tasks the individual tends to give preference to the routine even in the absence of strong time pressure (Woeste, 1969). There seems to be a trend toward an emphasis on the formalities of loan applications, increased time on administrative returns and the use of farm visits as a supervisory function. Agents spend at least 23%, and probably up to a third, of their time in the office. The result of these trends has been an increased farmer hostility toward supervised credit and lack of contact with extension agents. (ToVue, 1974).

Thirdly, Table II shows that although extension agents claimed they spend nearly 40% of their time on innovative activities the actual time spent is probably much less. This suggests that they are conscious of the fact that they should be spending more time in these areas, but are getting caught up in day-to-day routine activities. The agents' situation is important here. Most are the senior representative of their department on their station. They usually have to supervise a number of unskilled staff. Administrative support staff is rarely available. Only a few agents have professional colleagues on the same station who could give encouragement to more innovative activities.

TABLE III
MAJOR PROBLEMS FACED BY EXTENSION AGENTS IN PNG

	SURVEY		WORKSHOPS	
	Local Officers n = 57	Overseas Officers n = 46	χ^2	No. of Groups n = 12
LACK OF RESOURCES				
Transport	41	17	12.66**	5
Supplies	17	7	3.04	0
Funds	7	3	0.96	2
Staff	13	7	0.93	3
ORGANISATIONAL PROBLEMS				
Too much paper work	4	10	4.69*	0
Policy eg. "spoon feeding farmers, too many enterprises	4	6	1.05	4
Communication-intra dept.	12	16	2.42	2
Communication-inter-dept. (conflict with other departments)	31	23	0.19	7
Conflicting goals between departments	9	3	2.12	2
Promotion system	2	5	2.18	4
Rapid Transfers	3	5	1.12	4
Programmes, duties	8	7	0.03	5
LACK OF SKILLS				
Extension skills	9	1	5.38*	8
Extension training	4	1	1.29	1
Technical information	5	4	0.00	4
PERSONAL PROBLEMS				
Family problems	8	3	1.51	0
Don't like posting/isolation	6	6	0.16	0
Language	9	7	0.01	5
Working cond.(eg.housing)	11	2	5.16*	2
Relations O.I.C.	9	4	1.16	0
ENVIRONMENTAL PROBLEMS				
Land problems	1	2	-	2
Villagers apathy	0	13	18.43***	1
Traditions, cargo cult etc.	2	0	-	6
Political pressures	0	1	-	5

p < 0.05 *

p < 0.01 **

p < 0.001 ***

Finally, the figures at the bottom of Table II deserve comment. Only a small minority of agents claimed they regularly met with farmers outside of Public Service working hours or worked closely with officers from other departments. In the Workshop discussion groups a number of groups reported that Public Service hours were a major constraint on extension effectiveness. The most suitable time for discussions with farmers was at night or over the week-ends when the whole community was available to discuss problems. Fewer local extension agents claim they hold regular meetings with farmers.

(c) What Are the Main Problems Which Extension Agents Face in Their Work?

In both the discussion workshops and the individual questionnaires extension agents were asked to list the most important problems that they faced in their work. The results were subsequently categorised into five areas. These are set out in Table III (page 13).

Two problems stood out as being the most widespread - the shortage of transport and conflict with other departments. The transport problem has been discussed above. If extension agents become more involved in supervision and are based in larger towns away from their work then they will need more transport. However, many farmers are claiming they spend too much time running around in vehicles as it is. The significant difference between local and overseas officers deserves comment. Two explanations are possible. One is that local officers are less fortunate than their overseas counterparts in the allocation of transport. The other is that local officers may tend to see their problems in more concrete terms such as the shortage of resources rather than things like organisational problems.

It should also be noted that transport was often seen as a problem in relation to the drivers not working overtime or because of conflict with other departments over allocation.

The other main problem area concerned relations with other departments. Many extension staff were openly hostile toward officers of other departments, especially the staff of the Division of District Administration. Some saw this as a result of the different goals of the different departments, but a number of D.A.S.F. staff (29) complained that D.D.A. staff interfered in areas which should be the responsibility of D.A.S.F. A typical response was "The Kiaps (DDA staff) don't stick to their duties. There is an overlapping of responsibilities which leads to confusion for the farmers". Such widespread hostility suggests that it will be some time before some agents will co-operate closely with those from other departments.

The conflict between departments has come from the type of government structure which exists in Papua New Guinea with many departments competing for resources and the time of village people. It is, however, disappointing to find that local officers have retained the hostile attitudes of overseas officers towards kiaps despite the pleas from the National Government for closer co-operation between field staff.

A feeling that field staff did not receive support from headquarters officers was also widespread. Overseas officers tended to be concerned with the "bureaucratic system" which required "red tape" and excessive paper work. Local agents were usually more specific in their criticisms and concentrated on such things as their relationship with their superior officer. Many agents were also very critical of departmental policies and programmes. In this area eleven (11) agents specifically complained of too much direction from the "top" and seven (7) agents claimed that they should be given more direction. The following examples are quoted:

"The major problem is the differing attitudes and sometimes conflicting instructions from different levels in the chain of command. There is too much emphasis on production, projects and statistics rather than PEOPLE orientation".

"The main problem is the obsessions of O.I.C. eg. the determination to push cattle at all costs regardless of the real interests of the people or unsuitability of land.... Further the department only pays lip service to the protests of field officers on matters of policy"

"My problem is lack of clear goals. My duty instructions are too general".

Some of the other problems listed in Table III are of interest. Local extension agents were more conscious of their lack of extension skills and the need for more training in this area. In contrast overseas officers often blamed their failure to achieve results on the apathy of village people. Local agents also tended to mention personal problems more frequently, especially their working conditions. The standard of housing and accommodation was a particular area of concern.

(d) How Do Extension Agents View the Reward System?

Large organisations reward their staff through the opportunity for increased money (salary), power and status. In such an organisation the way in which individuals are selected for promotion becomes very important. The pilot survey had indicated a high level of concern among field staff about promotions so items were included in the questionnaire to collect the ideas of extension agents about the problem.

TABLE IV
RESPONSE OF EXTENSION AGENTS TO HOW ASSESSMENT
SHOULD BE DONE

(i) How Would You Decide if an Extension Officer is Doing a Good Job

	Public Servants	A.S.A.G.
A. ORGANISATIONAL CRITERIA - eg. follows instructions, reports, punctuality, hours worked.	17	6
B. AMOUNT ECONOMIC DEVELOPMENT IN AREA- people do what told, self sufficient projects	8	2
C. ACHIEVES OBJECTIVES	6	6
D. EXTENSION METHODS USED	1	2
E. OFFICERS SELF SATISFACTION	1	2
F. ATTITUDE OF PEOPLE IN AREA	8	5
G. ORGANISATIONAL & PEOPLE ATTITUDE	6	2
H. ECONOMIC CHANGE & PEOPLE'S ATTITUDE	10	14
I. PEOPLE'S ATTITUDE & RURAL CHANGE & ATTITUDE OF PEERS	2	7
J. LONG-TERM CHANGE ONLY	1	3

(ii) How Do You Think D.A.S.F. Decides Who is Doing a Good Job?

A. QUESTION NOT UNDERSTOOD OR SAME AS ABOVE	9	4
B. ORGANISATIONAL CRITERIA		
(i) Reports of O.I.C.	5	5
(ii) Reports by the Officer	9	-
(iii) Staff Assessments	4	1
(iv) Officers' Report & O.I.C. Reports	11	6
(v) Reports (Officers & O.I.C.) & Staff Assessments	5	1
(vi) Follows Instructions	3	-
SUB TOTAL	37	13
C. ACHIEVEMENTS		
(i) Physical Goals eg. projects started	10	4
(ii) Physical goals & keeps O.I.C. happy	-	7
(iii) Physical goals & Reports	-	3
SUB TOTAL	10	14
D. DON'T BELIEVE D.A.S.F. DECIDES	2	15

TABLE V

RANKING OF IMPORTANCE OF 21 SELECTED CRITERIA
FOR PROMOTION

iii) Ranking of Importance of Selected Criteria for Promotion.

ITEM	IMPORTANCE TO DASf				IMPORTANCE TO SELF			
	LOCAL		ASAG		LOCAL		ASAG	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Willingness to Assume Responsibility	4.56	4	4.36	3	4.72	1	4.64	3
Goal Achievement	4.71	1	4.41	1	4.69	2	4.66	2
Degree of Initiative	4.58	3	4.27	6	4.55	3	4.55	4
Ability to co-operate with OIC & Peers	4.60	2	4.30	5	4.53	4	4.32	6
Ability to Co-ordinate Efforts of others	4.45	5	4.41	1	4.53	5	4.68	1
Self Confidence	4.45	5	3.93	8	4.38	6	4.05	8
Technical Ability	4.02	8	3.73	10	4.31	7	3.98	9
Ability to See Long-Term Effects	4.20	7	3.34	14	4.24	8	4.30	7**
Administrative Ability	3.91	11	4.34	3	4.18	9	3.89	11
Written English	3.82	13	3.89	9	4.12	10	3.73	12
Spoken English	3.91	11	3.57	12	3.98	11	3.48	13
Being Liked by Village People	3.96	10	3.68	11	3.93	12	4.48*	5**
Willingness to Work Long Hours	3.78	15	3.41	13	3.76	13	3.95	10
Community Affairs Activity	3.45	9	2.61	20	3.42	14	2.70*	14
Having Univ. Degree	2.98	16	3.18	16	3.29	15	1.89*	19**
Being a Local Officer	2.82	17	3.96	7	2.91	16	2.31*	16**
Personally Liked by O.I.C.	3.82	13	2.66	19	2.76	17	2.48*	15**
Personal Contacts in Headqtrs.	2.76	18	3.27	15	2.75	18	1.70*	20**
Attendance in Church	2.33	19	1.61	21	2.60	19	1.43*	21
Personal Appearance	2.00	21	2.75	19	2.34	20	2.20	17**
Having Lucky Breaks	2.22	20	2.73	18	2.24	21	1.91*	18**

* Significant Difference between Local and Overseas Officers Score

** Significant Difference between importance to DASf and what Officers believe importance should be.

The A.S.A.G. Officers showed much more concern over assessment criteria. This can be attributed mainly to the fact that at the time of the survey most local officers were experiencing a rapid rate of promotion. A further factor is the difficulty Melanesian people have in attitude projection (see Part II).

This means that the questionnaire may not have been well designed to obtain the attitude of local officers to this problem.

The results obtained show that nearly all the agents think that the department relies mainly on formal reports and the achievement of physical goals to decide which officers are doing the best job. Most want the department to take much more account of what the people in an area thought of an officer's work in assessment. Some felt that the ideas of his fellow workers (peers) would also be a good way to tell if an agent was doing a good job or not. The following quotes illustrate the ideas of field staff:- I would decide if an extension worker was doing a good job by - "If he does the job as he is told" (Organisational) "Contacting at random villagers and councillors in area to see what they thought of his work". (people's attitude).

"By discussion with peers and the people in the area eg. the ADC, by his results with regard to area of operation" (people's and peers attitude and change).

D.A.S.F. decides if an extension officer is doing a good job by "Counting the number of projects that he can claim to be instrumental in establishing" (physical achievements).

"His ability to keep his O.I.C. happy with physical results (eg. production figures) and how well he keeps up with the paper war".

"Prompt reply to urgent matters to H.Q. and good relationships with H.Q. staff".

Both groups of extension agents gave a similar ranking to a given set of criteria which could be used for promotion with the important exception that local officers gave a much lower importance to being liked by the village people. The local officers were less likely to select the items which were not important and this is the reason for most of the differences in scores between the two groups. Local officers did not see much difference in how important they thought the items should be and how important they thought they were to D.A.S.F. (see Part II). A.S.A.G. agents thought that their department gave too little importance to long term aspects and village people's response and too much emphasis on formal qualifications, local officers, personal relations with O.I.C. and H.Q. staff and on personal appearance.

(e) What Sort of Extension Service Should We Have in Future?

Those agents who submitted comments on the type of extension service which would best serve the needs of Papua New Guinea showed a concern about the present conflict between different departments in the field. Most wanted closer liaison between departments, but a small minority thought the problem could best be overcome by a strict definition of the duties of agents from different departments.

This view is represented by the following quote:

" There are many extension officers in different departments concerned with the same thing or almost similar. However, in order to prevent any further conflict extension officers in each department should concentrate on his side of things and not get in the way of other extension worker".

A small majority (see Table VI) were strongly against any organisational changes which would take responsibility for agricultural extension away from D.A.S.F. Few of this group gave any reasons for this view, but some felt that big changes in the service may create too much confusion which would over-ride any advantages changes might bring in theory. Some other agents said that agriculture should not join with other departments because of the bad name of these departments with village people. Most of those against changes in the organisational structure were A.S.A.G. officers. This might be taken to mean that overseas officers are more conservative than local officers, but more likely it simply means that they are happier with the present structure because it comes from their own culture. Local officers are more willing to see changes made because they don't think the present organisation fits their culture very well.

TABLE VI
OFFICERS SUPPORTING AND OPPOSING CHANGES IN
ORGANISATIONAL STRUCTURE

	Public Servants	A.S.A.G.
Strongly support Change	21	13
No Stated Preference	21	9
Strongly against Change	13	22

$$\chi^2 = 7.87 \quad p < 0.02$$

A large number of local officers and some overseas officers wanted to see the different extension departments working much closer together. One way they said this could be done by joining all the different departments into one department. The agents who favoured this approach pointed out that police powers must be kept separate from the extension department. The following are some of the things these agents said about the future service:

" The agricultural extension officer should be part of an extension team with his ultimate boss the Area Authority or similar group. In the field, team members would have different but overlapping functions.

One place there should be absolutely no overlap is police powers".

"Need to link all departments with extension services. Local Government could be the middle man between people and combined extension teams. Need co-operation because the services all go to the same people. We need to rationalise the time and resources of extension services and of rural people".

"Need better and mutual co-operation between Councils and extension resources (D.A.S.F., Public Health, Social Development and Education - these should all make up a department of extension workers"

"We need extension 'teams' for each Sub-District, To be made up of extension agents from each Government Department, if possible, working out of the one building complex. Need close co-ordination, co-operation and possibly integration with local authorities (Councils, Area Authorities etc.). The elected members (Councillors) should certainly be part of the overall extension, education programme. The 'team' should encourage the co-operation and participation of outside extension agencies eg. Savings and Loan Movement, Missions".

As these quotes show, a number of agents felt strongly that there should be closer integration of extension and local governments. Some said that the local government councils should take over the responsibility for all the village level workers eg. Rural Development Assistants. Some other officers said that we should be careful about working with local governments because councils often did not work very well and rural people sometimes strongly opposed them.

(f) What Kind of Training Should Extension Agents Have?

Most extension agents agreed on the kind of training that they need. They felt that the extension officer should have a sound grounding in the technical aspects of agriculture, preferably to diploma level. Some basic principles of rural sociology and psychology should be included in the basic formal course, but the officers agreed that most extension training is not very useful until agents have had field experience. Therefore the officers said that extension training should be mainly in-service after they had been in the field at least two years. Some said there should be refresher courses every five (5) years. There was a general feeling that the experience of extension work in other developing countries should be used in extension training more than at present.

Local officers who thought that village level workers should be employed by local government councils saw an expanded training role for D.A.S.F. in training these people. This training should cover both simple agricultural skills and low level extension skills.

(g) How Good Are Agents at Agricultural Extension?

The survey aimed to develop a measure of extension skill. The measurement was based on how well the agent did the things required under a 'democratic' extension strategy. This is discussed in Part II at length. The results of the measurement are as follows:

TABLE VII
LEVELS OF EXTENSION SKILLS AMONG D.A.S.F.
EXTENSION AGENTS

	Public Servants	A.S.A.G.
Very Low (1-2)	9	4
Low Score (3-4)	22	17
High Score (16-18)	21	14
Very High Score (8-10)	5	8

The reasons why there are big differences in extension skill between officers within each group are more important than the differences between the two groups.

(h) What Are the Factors Affecting the Individual Extension Skill?

The nine variables listed above were compared against extension skill using Yule's Q analysis. Many of the variables showed relationships with each other and six of them were closely related to extension skill. Agents who had been to extension training courses, who had a high professional orientation and who had a low level of bureaucratic orientation were more likely to have a high level of extension skill. At a lower level of significance Officers who had longer service were more likely to have high extension skill. Officers who were good at extension were more likely to have high role conflict and dissatisfaction with the present organisation. However, some of these things were related to each other. Officers who had received the most agricultural education for example, were the most likely to have received extension training, they were less likely to have a high bureaucratic orientation, and they were more likely to have a high professional orientation.

Additional analysis was undertaken to find out which of the variables were the most important ones affecting extension skill. The most important variable was found to be bureaucratic orientation.

Extension agents who have a low level of bureaucratic orientation will be the most likely to be good at their work. In other words, the officer who gets on with the job without worrying about what his boss will think, what the rules and regulations say he should do, or what administrative returns he should do will generally do the best extension job. However, there were some officers in the survey who had an extremely low bureaucratic score. These officers were against everything their organisation (D.A.S.F.) did to such an extent that they made very poor extension agents. The other factors which were important to extension skills were a high professional orientation and extension training. The level of education is important indirectly because officers with more education were more likely to have a high client orientation and a low bureaucratic orientation.

4. DISCUSSION

The survey aimed to find out the things which tended to prevent the agricultural extension service in Papua New Guinea from working effectively. To do this we need to look at agricultural extension against its overall objective to achieve rural improvements in such a way that rural communities are actively involved in planning their own programme (decentralisation) and that equality between areas and between groups of people is maintained. To achieve these objectives, a democratic 'self-help' extension approach is required. This kind of extension strategy is difficult. It requires extension agents to understand and deal with all the various technical, economic, social and political factors which affect the community.

Because of the difficulty of agricultural extension there is always a tendency for extension agents to become directive in their approach to farmers or, on the other hand, to withdraw from contact with farmers and concentrate on tasks within the organisation. Some of these tasks are office work such as administrative returns and concentrating on building up an extension centre or station. The survey tells us some of the reasons for this trend.

One is the level of education and extension training of agents. Many officers felt they were lacking in extension skills and called for more training in this area. The survey results show that a greater emphasis on extension training and an increase in the entry qualifications to the extension service can be expected to improve the effectiveness of agricultural extension. However, both these solutions are expensive.

In addition the results of more training and education will depend on the type of work environment that the individual extension agents will have to contend with.

A second problem area for extension agents was the lack of resources to achieve their programmes. Most extension officers complained that they were given insufficient resources, especially transport. However, it is doubtful if a sudden increase in the resources available would significantly improve extension effectiveness. This is because the supply of resources from central government runs counter to the 'self-help' objective of agricultural extension. The more resources an extension agent has the more likely he is to use those resources to 'get the job done' quickly rather than relying on the community to mobilise their own resources. In the case of transport it seems that the provision of more roads and vehicles results in agents spending more time running around in the vehicles to supervise projects at the expense of time spent sitting down with farmers and teaching them how to run the projects themselves. Again the extent to which this trend applies to the individual officer depends on the work environment of that officer.

The survey has therefore concentrated on the work environment within the extension organisation as the most important factor limiting the effectiveness of agricultural extension. The central theme of the investigation is that a bureaucratic organisation like the present government departments does not support a democratic 'self-help' extension approach. There are two main reasons for this. First, in a bureaucratic organisation there is an hierarchy of power and authority from top to bottom. Those at the top decide on policies and tell those below them what to do. The extension officer in the field is placed in a position of high role conflict - on the one hand he is expected to meet the requirements of the organisation and on the other hand he has the interests of the client to contend with. The organisation can offer rewards to the officer in the form of higher salaries and status if he meets the requirements of the organisation. Where the organisation is large and centralised it is very difficult to decide who should be given the rewards other than relying on the achievement of short-term goals in the field and how well the officer follows organisational procedures. Rightly or wrongly, extension agents feel that they will be judged as doing a good job if they get some quick results and do their administrative duties well. This means that they feel the organisation wants them to be directive in their extension work.

In other words the type of organisation we now have tends to encourage bureaucratic personalities among the individuals within it. Unfortunately, the survey results show that the development of bureaucratic personalities is the most important factor in low extension skill. Officers who were good at extension had a low bureaucratic orientation and high orientation toward his clients. Therefore, to improve extension effectiveness we need to develop an extension organisation which encourages its agents to be more client oriented and less bureaucratic.

The second organisational problem comes from the large number of different departments involved in rural development. Although officers from each of these departments may be posted to the same location, each of the departments has its own set of goals and objectives and they will each have their own idea of how these goals should be achieved. Because of the different organisational environments in which they each work there will often be conflicts between the different departments when they have to work together. The survey showed that this conflict is very high. There seems to be a lot of duplication of both effort and time. In addition, there is no one department which takes an overall view of a community problem. Instead, each department takes its own small specialist area in isolation from other aspects of the problem.

Two other problem areas were emphasised by extension agents. These were personal problems such as family problems and dislike of posting, and problems caused by the type of environment we have to contend with in Papua New Guinea. Many of the personal problems come from the very rapid rate of change being experienced at the time of the survey. Many local officers were experiencing difficulties in adjusting to these changes. Some of the personal problems suggest that the education and training of extension agents and their present working environment is orienting them toward urban living patterns and away from rural communities. Again, this is almost inevitable, given the current organisational structure for practically all the senior positions are located in urban areas. However, the results suggest that this trend is not yet as serious as some people believe. In fact, a number of local officers said that they should be given more opportunity to live in villages so they would have a better understanding of farming problems. Environmental problems were not generally emphasised. However, it should be noted that many areas in Papua New Guinea are regarded as difficult areas for extension officers because the people were opposed to many government efforts.

Often this can be traced to past neglect or the failure of government sponsored projects.

V. CONCLUSION

The Bulletin examines the effectiveness of the agricultural extension service in Papua New Guinea. It does not compare the service with those elsewhere. The Bulletin may sound over critical of the present service. In fact, if we compared the service against others it would probably appear better than most. However, the claim of this report is that there is room for improvement. By pointing out the present problems we may prepare the ground for such improvements. Essentially, the theme of this report is that the present structure of the agricultural extension service in Papua New Guinea is not well suited to the goals of agricultural extension. The organisation is a centralised bureaucratic one which is best suited to production activities with a high degree of specialisation. In extension it favours a directive and supervisory approach. The present goals of agricultural extension are for a democratic 'self-help' approach requiring an innovative approach to the overall problems of a community.

There would seem to be three possible approaches to overcoming this basic conflict. The goals of rural development could be changed to fit the organisation; the organisation could be changed to fit the goals; or rural development could be encouraged outside the framework of the present extension service.

The first alternative is to admit that the present extension organisation is best suited to a directive approach to rural development. The strategy of rural development could therefore become a directive 'centralised planning' one where the plans and procedures for carrying out the programme would be worked out at central levels of government. Under this approach extension agents would simply become agents in the line of command which told the people what they had to do. As the rural people have little involvement in such programmes, the usual result of such a strategy is to alienate the people from the government. In addition, projects started in this way usually need continued supervision by central government agents. The adoption of such an approach would also be contrary to the present government's policies.

The second alternative is to create a more innovative organisation. Thompson (1965) has described the type of organisation that would be needed.

Above all, the organisation would need to be professionally oriented. Officers would require extended pre-entry training and it would encourage service to the client and support from fellow officers. Such an organisation would have a loose structure, such as the extension 'teams' mentioned above. In such teams duties will not be strictly defined and free communication would be encouraged in all directions. It may not be a good thing to talk of an overall extension department when we think of the new organisational structure suggested, because when we talk about departments we tend to think of present models. Rather, it might be better to think of teams which come together under a local authority (eg. local government, Area Authority) for specific tasks. These teams would have little stratification. In other words, officers would be of equal rank in the team for status except perhaps for a team leader. The extension 'team' or unit may need to restructure itself for each problem it tackles. For example, it may need both crop and livestock specialists sometimes and general agriculturalists at others. In the assessing the performance of individual officers, the extension units would use assessments by fellow officers (peers) to fill important positions rather than ratings by O.I.C.'s. In such an organisational structure, the positions of highest reward would be out in the field dealing with rural people rather than urban administrative positions as at present. Each unit would be free to develop its own client oriented working patterns (eg. hours of work) rather than accepting current urban patterns.

It is difficult to define such loosely structured working units more precisely. Each unit would be expected to develop according to its own situation. However, a number of field agents have an organisation of this type in mind in giving suggestions for future extension service for Papua New Guinea. It is unusual for the 'rank and file' of any organisation to suggest that changes should be made in organisational structure, but in the current survey a majority of local officers and a number of overseas officers thought changes should be made.

The third alternative is to bypass government agencies and rely directly on 'grass roots' movements to stimulate rural development. In Papua New Guinea there has been a rapid proliferation of such movements in recent years. Most have arisen in opposition to the central government. Many have strong cargo cult overtones, some are political while others have economic development goals. These grass roots movements have in common a high potential to effectively mobilise

rural people and to create organisations which are suited to Melanesian cultural traditions. However, they are plagued by a lack of technical skills. This means that these groups frequently set themselves unrealistic goals and they have difficulty in implementing their programmes. At present skilled manpower is being taken up by government employment and by large private companies. If more of these skilled people could be encouraged to return to village based groups and help to run them, there might be more rural improvement than under the present strategy.

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APPENDIX

Value of Indigenous Production of Major Agricultural Crops in
Papua New Guinea.

CROP	1970-71 <u>(\$'000)</u>	1971-72 <u>(\$'000)</u>	1971-72 (Adjusted*) <u>(\$'000)</u>
Copra (1)	7,928	5,203	7,487
Cocoa (2)	3,888	2,988	3,892
Coffee (3)	14,812	14,723	17,447
Tea (4)	274	328	370
Rubber (4)	29	39	42
Pyrethrum (5)	286	227	219
	<u>27,217</u>	<u>23,508</u>	<u>29,457</u>

* Adjusted to average 1970-71 value/ton.

- (1) From exports and produce inspections. 55.4% total crop 1971-72
- (2) From exports and produce inspections. 27.1% total crop 1971-72.
- (3) Taken as 72% of total crop.
- (4) From purchases by D.A.S.F. and exports.
- (5) Wholly indigenous production.

THE AGRICULTURAL EXTENSION SERVICE IN PAPUA NEW GUINEA

PART II

MEASURING EXTENSION SKILL AND RELATED FACTORS

I. INTRODUCTION - WHAT IS EXTENSION SKILL?

Part I of this Bulletin has outlined some of the problems of providing an effective agricultural extension service in a developing country. This discussion has concentrated on three key factors - the lack of technical and extension skills among field agents, the difficulty of setting clear aims or objectives in extension and the development of an organisational environment which hinders rather than supports effective extension. It was shown that agents brought up problems in these areas including their own lack of "extension skill". This leaves open the question of what we mean by extension skill.

It is commonly accepted that some people are better than others in doing extension work. It is also accepted that we can train people so that they will be able to do extension work more effectively. Most training courses in agriculture now include sections which cover extension work. Usually this training covers some aspects of rural sociology together with specific extension methods such as radio broadcasts, result demonstrations and show exhibits. It is usually difficult to find a systematic determination of training need, by an analysis of jobs and programme emphasis, associated with these extension training courses.

As we have stated in Part I the extension policy of the agricultural extension service in Papua New Guinea is a ' democratic' one which aims to actively involve rural communities in the improvement of their living conditions. For such an approach Avery (1971) has defined three areas in which the individual extension agents require special skills -

- (i) An ability to orientate their activities to the whole rural community rather than the individual farmers;
- (ii) The ability to recognise and make their programmes relevant to the goals of both individual farmers and rural communities; and
- (iii) The ability to undertake interdisciplinary problem solving approach in their work.

This is required on three levels - at the farm family (decision making), - at the community or region (planning) and - at Government level (policy making).

Tully (1971) has listed the following steps for such a problem solving approach:

- . recognition of the problem in general terms - basic economic and technical knowledge of agriculture is required here.

- . recognition of all the important variables or parameters concerned with the problem,
- . recognition of the interrelationships of these variables or parameters,
- . recognition of the causes of the problem,
- . recognition of possible solutions to the problem,
- . recognition of the most practical and economic solution,
- . planning to carry out the solution.

A job analysis of extension agents in Australia and Papua New Guinea (Craven, 1971) has shown that agents themselves tended to regard problem solving (' troubleshooting ') activity as a central part of their work. However, the most important group of functions to extension agents were those classified as ' public relations '. These were items related to the problem of gaining and maintaining farmers confidence and co-operation. Their high emphasis suggests that extension services are not well received by the public in Australia and Papua New Guinea. Agents also placed a high emphasis on a ' tutor ' role which was concerned with helping the individual farmer. Other roles undertaken by extension agents were defined by factor analysis as ' the planning and evaluation of extension ', implementation of extension programmes, ' research and research liaison ' and ' office and inspections '. Cooper and McKillop (1973) tested the same items with local extension officers in Papua New Guinea. The results were very similar except that local agents tended to place a greater emphasis on group extension methods, ' tutoring ' functions and implementation functions and less emphasis on ' public relations '. Overall extension agents in Papua New Guinea showed a higher awareness than their Australian counterparts of the extension skills required for a problem solving, whole community approach based on farmers goals. However, a strong tendency to direct farmers to comply with the agents' programme was still evident.

II. CAN WE MEASURE EXTENSION SKILL?

Ideally evaluation of extension effectiveness should be based on the achievement of objectives. However, we are immediately faced with a number of problems in applying this to individual agents. Firstly, there are many factors contributing to the change process. It is virtually impossible to determine to what degree resultant changes have come as a result of extension effort.

Secondly, different communities vary greatly in their readiness to accept change, especially in Papua New Guinea. How are we to compare the results of an agent in one area with those of an agent based elsewhere? Finally, there is the dilemma of the time period over which change is to be measured. Given these difficulties the extension skill of individual agents may provide a more realistic empirical assessment. This was the approach adopted for the present study.

Information was collected from extension agents throughout Papua New Guinea in the following basic skill areas:

- (i) Degree to which agent concerns himself with the whole community rather than individual farmers.
- (ii) Degree to which agent can define problems from the farmers point of view and relate his programme to farmers' goals.
- (iii) The adoption of a problem-solving approach to extension programmes.

Specifically each extension agent was asked to set out the time spent on each of twelve different activities normally undertaken by extension agents. The categories were classified into two groups following the procedures of Woeste (1969) as follows:

- (i) Innovative activities - which involved a high level of innovative or problem solving decision making and which involved a community rather than individual extension approach.
- (ii) Routine activity - these activities required decisions that were repetitive and routine, to the extent that a definite procedure has been worked out for handling them. Administrative duties, office visits by individual farmers, formal meetings and visits to individual farms for supervised credit, were placed in this category.

These activities and the average time spent on each is given in Table II of Part I. Officers who devoted a greater proportion to innovative activities were said to have a higher level of extension skill. It is held that this measurement gives an indication of the degree to which an agent is concerning himself with the whole community and adopting a problem-solving approach to his work. Second, agents were asked a number of questions about their extension programme. These were:

- (i) Whether or not the problems on which the programme was based.

would be problems as seen by the farmer rather than the extension agent (problems).

- (ii) Whether or not a wide range of alternatives had been considered as possible solutions to the problem (alternatives).
- (iii) Whether or not clear goals had been set for the programme in performance terms (Goals).
- (iv) Whether the farmers concerned had been involved in setting these goals (Who set Goals?)
- (v) Whether or not clear steps had been taken to ensure that the rural community would be fully involved in all decisions of the programme (Involvement).
- (vi) Whether or not the agent had a clear concept of the future directions of the programme (Future).

These six items were selected as items related to Conceptual Skill (Emery and Oeser, 1958; Crouch, 1970; Tully, 1971). This measurement has been applied to farmers to test their ability to diagnose problems and to plan for change. The items were selected from all three areas of extension skill. Agents who scored highly on these items are held to be more skilled at extension.

Agents were also tested for the action they would take given a defined extension problem. A simple theoretical case study typical of those facing extension agents in Papua New Guinea was provided and officers were asked to choose between three given action programmes or to suggest their own for each of three extension problems. These problems were if the people had decided to hold a meeting on coffee prices (Problem A), if they had decided to undertake a water supply project (Problem B), and if they decided on a cattle project (Problem C). These responses were scored for the selection of extension methods which explored the problem further (only limited information was given) and which fully involved the community concerned. It is held that agents with a high extension skill will select the methods best suited to the problem.

Finally, agents were asked to describe what his aims and functions were and these responses were scored for role concept in relation to the official extension strategy described above.

The next question is, do these different measurements measure the same thing? Do they in fact form a scale which we can call extension skill? From the results obtained ten (10) of the items were found to form a Guttman unidimensional scale. These items, in increasing order of difficulty, were:

1. Problem C
2. Farmer Problems
3. 35% Innovative activity or more.
4. Problem B
5. Problem A
6. Involvement
7. Who Set Goals
8. 50% Innovative Activity or more
9. Goals
10. Alternatives

Range of Scale 0 - 10. Coefficient of Reproducibility(R) = 0.91. This scale is called INDEX OF EXTENSION SKILL.

Having developed a scale and called it Extension Skill the next problem is to determine the predictive validity of the measurement. In other words do people with high "extension skill" make more effective extension agents than those with a low score? This is not so easy as we still have to make some independent judgement on how effective extension agents are. One way of doing this is to have judges look at the extension work of a number of agents in the field and rank them according to how good he thinks they are at extension. This ranking can then be compared with the index of extension skill for these officers. However, this is not so easy to do where agents are scattered over a wide area and working under different conditions. Each judge could only get to know the work of a few agents. Also the problem of the criteria by which the judges will assess the agents still remains. This test was done however for a small sample of agents (n=16). The result was a rank order correlation (Spearman's coefficient) of 0.94. This means that there was a very high level of agreement between the Index of Extension Skill and how well the judge thought the officers were at extension work.

A measurement of extension skill which forms a unidimensional scale has thus been developed and initial tests suggest that it might have validity as a measurement of how well extension officers do their work. A lot of work needs to be done yet, but if validity can be established further then the measurement appears to have application in the evaluation of extension training programmes. The next task is to see if this measurement can be used for this sort of work.

III WHAT ARE THE FACTORS WHICH AFFECT EXTENSION SKILL?

There are many influences, both direct and indirect, formal and informal, which are operating on individual extension agents which could affect their skills in extension. It is generally accepted that there are three main areas of influences which we must consider in extension - the education and training which the agent has undertaken, the field experience of the agent and the personality of the individual.

We can measure how much education and training in extension individual officers have actually received. In the survey we have done this by taking the number of years agents have undertaken in tertiary agricultural training for education level and whether or not they had been to extension training courses. For education agents were scored for diploma and university training (3 and 4 years) against certificate training (2 years). Extension training was scored for courses of more than four weeks duration. These measurements were then compared with extension skill to test the following hypotheses:-

HYPOTHESIS 1A : THE SCORE OBTAINED IN THE EXTENSION SKILL INDEX WILL BE DIRECTLY RELATED TO THE LEVEL OF EDUCATION ATTAINED.

HYPOTHESIS 1B : THE SCORE OBTAINED IN THE EXTENSION SKILL INDEX WILL BE DIRECTLY RELATED TO EXTENSION TRAINING.

Field experience can be measured in various ways. For this survey the number of years of service in the organisation was used. This measure was scored for agents having 3 or more years service in an agricultural extension organisation within Papua New Guinea.

In cases where agents had served in similar functions in other organisations within Papua New Guinea this was counted. The low cutting point for service was due to the extreme mobility within the extension service at the time of the survey. Field service was compared with extension skill to compare the following hypothesis:-

HYPOTHESIS 2: THE SCORE OBTAINED IN THE EXTENSION SKILL INDEX WILL BE DIRECTLY RELATED TO LONG SERVICE.

Personality factors present a much more difficult task for empirical measurement. Many people make subjective judgements that various types of personality are not suited to extension work; in fact, some agents in the survey claimed this as their major personal problem, but this is hardly the basis for empirical study. However, some aspects of personality are directly related to the central theme of this survey and have received extensive study. Two factors, bureaucratic orientation and professional orientation, were selected for the study. In 1957 Merton presented a pioneer essay in which he pointed out that bureaucratic structure as found in large organisations has a big influence on the personalities of the individuals within the organisation. Bureaucratic structure exerts a constant pressure on the official to be methodical, prudent and disciplined, but frequently overstresses discipline, so that the goals of the organisation are displaced in favour of formalism which relies on regulations and procedures. In simple language maintaining the system or looking after the "red tape" becomes the primary concern. Bureaucratic officials are unable to adjust readily to changed situations - they fall back on a directive extension approach rather than an advisory one. In contrast extension agents are required to deal with complex and continually changing problems. They must be innovative in their work. This requires a professional approach to their work (Thompson, 1965). A number of authors have claimed that the development of client oriented professionalism and the avoidance of a bureaucratic approach are the most important factors in improving the effectiveness of extension services (Hercus, 1972; Watts 1969; Watts 1973). Many researchers have used attitude scales to measure bureaucratic orientation (Bonjean and Grimes, 1970; Corwin, 1969; Gordon, 1970) and professional orientation (Corwin, 1969; Thornton, 1970). In the present study the following scales were used:

BUREAUCRATIC ORIENTATION: 9 items were selected from Gordon's (1970) WEPS scale and reworded slightly to fit Papua New Guinea conditions. These items measure commitment to a set of attitudes, values and behaviour which is characteristically fostered and rewarded in

bureaucratic organisations. Gordon developed his scale of five characteristics -

- (i) self-subordination or commitment to hierarchical authority.
- (ii) traditionalism,
- (iii) rule conformity,
- (iv) compartmentalisation and
- (v) impersonality, on a 5 point Likert scale.

Three items measuring rule conformity were used, 2 for self-subordination and traditionalism and one each for compartmentalisation and impersonality. The items were also found to form a Guttman scale (Co-efficient of Reproduceability = 0.90). Scores obtained ranged from 12 to 39 with a median of 27.43.

PROFESSIONAL ORIENTATION: A 9 item scale pertaining to four norms of professionalism was developed after Corwin (1969). The four norms contributing to professionalism are

- (i) client orientation,
- (ii) autonomy,
- (iii) value placed on knowledge and skills, and
- (iv) responsiveness to colleagues and professional organisations.

In the pilot survey the items were found to form an unidimensional scale (coefficient of reproducibility = 0.90), but just failed to reach acceptable limits in a cross-cultural situation ($R = 0.88$). The scores obtained ranged from 19 to 36 with a median of 28.3. The scores obtained for bureaucratic and professional orientation were compared with the index of extension skill to test the following hypothesis:

HYPOTHESES 3A: THE SCORE OBTAINED FOR INDEX OF EXTENSION SKILL WILL BE INVERSELY RELATED TO THE SCORE OBTAINED FOR BUREAUCRATIC ORIENTATION.

HYPOTHESES 3B: THE SCORE OBTAINED FOR INDEX OF EXTENSION SKILL WILL BE DIRECTLY RELATED TO PROFESSIONAL ORIENTATION.

In other words agents who have a high extension skill will be low on bureaucratic orientation and high on professional orientation. The effect of education and extension training on extension skill indirectly through their effect on bureaucratic and professional orientation can also be considered. It is considered that agents with greater education levels and who have received extension training will be more professional and less bureaucratic. In this way education and extension training will have an indirect effect on extension skill.

The following hypothesis were tested:

HYPOTHESIS 4A: THE SCORE OBTAINED FOR INDEX OF EXTENSION SKILL WILL BE DIRECTLY RELATED TO THE JOINT EFFECT OF HIGH EDUCATION AND PROFESSIONAL AND LOW BUREAUCRATIC LEVELS.

HYPOTHESIS 4B: THE SCORE OBTAINED FOR INDEX OF EXTENSION SKILL WILL BE DIRECTLY RELATED TO THE JOINT EFFECT OF HIGH PROFESSIONAL AND EXTENSION TRAINING AND LOW BUREAUCRATIC LEVELS.

Another way of looking at the problems of extension agents in a large organisation is to examine extension skill in relation to factors associated with organisational role. A number of studies have been undertaken which measure such factors as alienation, role conflict, role tension, organisational commitment and dissatisfaction with the organisation. Two of these measurements were used in the current study:

ROLE CONFLICT: a measure of the disparity between role activities individuals felt they should do as a professional and what they actually did working in their present organisation. The method of measurement followed Hrebiniak and Alutto (1972). Subjects indicated the percentage of time they actually spent on 12 activities (see Part I) and the percentage of time they felt they should as a professional allocate to these activities. The absolute magnitude of difference between these two lists is taken as a measurement of the individual's perception of role conflict. Scores were 0 to 137 with a median of 43.5.

DISSATISFACTION INDEX: a measure of an individual's displeasure with the organisation's reward policies. The method of measurement followed Hrebiniak and Alluto (1972). It assumes that dissatisfaction arises primarily from a disparity between reality and some ideal of the individual. Respondents were asked to rank on a 5-point scale the actual importance of 21 criteria for advancement in the organisation. These were selected from Alutto and Hrebiniak (1970) and the department's staff assessment forms. A full list of items is given in Table V in Part I. Respondents were then asked to rank how important they thought the items should be for organisational advancement. The sum of the absolute differences between the two rankings provides a score based on the agents perception of how well the employing system is recognising and rewarding what he or she sees as the proper basis for organisational advancement. The higher the score the greater the displeasure. Scores obtained ranged from 1 to 40 with a median of 12.76.

It was held that skilled extension agents would find the present organizational structure less supportive to their efforts than those with less skill. They would have higher levels of role conflict and dissatisfaction. Role conflict and dissatisfaction were therefore compared with extension skill to test the following hypothesis:-

HYPOTHESIS 5A: THE SCORE OBTAINED FOR EXTENSION SKILL
WILL BE DIRECTLY RELATED TO ROLE CONFLICT.

HYPOTHESIS 5B: THE SCORE OBTAINED FOR EXTENSION SKILL WILL
BE DIRECTLY RELATED TO DISSATISFACTION INDEX

In addition the racial origin of extension agents was measured against the above variables to determine its effect. The main purpose of this inclusion was to check on the reliability of the other measures used.

IV. RESULTS

The information was subjected to survey analysis procedures after Davis (1971) using Yule's Q coefficient to test association. For comparative purposes a multiple regression analysis was also undertaken.

TABLE I

Q- coefficients for Zero-Order Correlations of Variables

	$\bar{A}$	B	C	D	E	F	G	H	Y
A Bureau		.34	.53	.21	.44	.64	-.15	.23	.57
B Professional			.13	.41	-.49	.11	.22	-.19	.27
C Education				.90	.96	.46	-.13	.58	.28
D Ex. Training					-.26	.01	-.26	.15	.29
E Race						.62	.18	.84	.07
F Role Conflict							.37	.40	.69
G Service								.06	.11
H Dissatisfaction									.09
Y Extension Skill									

The correlation matrix shows all variables except race and dissatisfaction index to be correlated with extension skill. The correlation of race with some of the other variables, however, suggests some problems. In particular race was highly correlated with bureaucratic orientation, professional orientation, agricultural education, role conflict and dissatisfaction index. This suggests that these measurements may be culture bound.

The correlation between race and agricultural education is due to the sample taken. All certificate holders were local officers. This is a concrete fact and should not affect the results.

The correlation between race and bureaucratic orientation, professional orientation, role conflict and dissatisfaction index can be interpreted as being due to cultural effects on the measurement of these variables. The first two are 5 point attitude scales and for these local officers score higher than overseas officers on both bureaucratic orientation and professional orientation in spite of the fact that the scales are opposed to one another. Role conflict and dissatisfaction both require the respondent to rate items on what they are now and then, project to what they should be, the measurement being the difference between the two ratings. On both these measurements local officers had far lower scores than overseas officers. In short, it seems that local officers had different scores on these items because they required abstract thinking.

A number of workers have been looking at this problem and have found a lot of evidence which suggests that Papua New Guineans are less able to handle abstract material than people from Western cultures (Hutton & Ellison, 1970); Mulford and Young, 1973; Feather and Hutton, 1974). If this is true of our measurement of these four variables then the effect of culture on the measurements will make a difference to the overall results. As the variables are dichotomised for Yules Q coefficient we can correct for this effect by scoring against the medians for each racial group, viz:

Bureaucratic Orientation	- Overseas 27.0, Local 29.5
Professional Orientation	- Overseas 28.1, Local 29.4
Role Conflict	- Overseas 52.5, Local 33.9
Dissatisfaction Index	- Overseas 19.2, Local 9.6

Multi-variate analysis was undertaken with these corrected groupings as follows:

TABLE II

Q-coefficients for Zero-Order Correlations of Variables

(Corrected for Cultural Differences)

	A	B	C	D	F	G	H	Y
A Bureaucratic	.54	.51	.34	.10	.34	.00	.22	.60
B Professional		.11	.34	.10	.34	.28	.35	.48
C Education			.90	.96	.29	.13	.13	.28
D Extension Tng.				.26	.24	.26	.07	.29
E Race					.09	.18	.02	.07
F Role Conflict						.32	.10	.39
G Service							.38	.11
H Dissatisfaction								.38
Y Extension Skill								

TABLE III

Condensed Summary of Multi-Variate Analysis

ITEM	ZERO ORDER	TEST VARI- ABLE	TX	TY	PRODUCT	EFFECT TERM	PAR- TIAL	DIFFERENCES
Bureau. $\bar{A}$	+ .60	B	.54	.48	+ .2592	+ .69	+ .55	+ .14
		C	.51	.28	+ .1428	+ .54	+ .55	- .01
		D	.34	.29	+ .0986	+ .69	+ .62	+ .07
Profess. B	+ .48	$\bar{A}$	.54	.60	+ .3240	+ .61	+ .42	+ .19
		D	.34	.29	+ .0986	+ .51	+ .42	+ .09
Education C	+ .28	$\bar{A}$	.51	.60	+ .3060	+ .22	+ .05	+ .17
		D	.90	.29	+ .2610	+ .15	+ .05	+ .10
Extn. Tng. D	+ .29	$\bar{A}$	.34	.60	+ .2040	+ .32	+ .18	+ .14
		B	.34	.48	+ .1632	+ .31	+ .18	+ .13
Service G	+ .11	$\bar{A}$	- .00	.60	+ .0000	+ .02	- .02	.04
		D	- .26	.29	- .0754	+ .23	- .02	+ .25
		F	.32	.39	+ .1248	+ .21	+ .05	+ .16
<u>Consequent Variables</u>								
Role Con. F.	+ .39	$\bar{A}$	.34	.60	+ .2040	+ .46	+ .27	+ .19
		B	.34	.48	+ .1632	+ .51	+ .27	+ .24
Dissatn. H.	+ .38	B	.35	.48	+ .1680	+ .38	+ .30	+ .08
		G	.38	.11	+ .0418	+ .31	+ .30	+ .01

A multiple regression analysis was also undertaken using the various measures as continuous variables. Because of the low coefficient of reproducibility obtained with the professional orientation the client orientation and autonomy norms of this scale were used in the analysis.

The validity of using multiple regression techniques on the data is open to question. The results are reported for comparative purposes only.

The Correlation Matrix for multiple regression is given in Appendix I. Similar results to the Q analysis were obtained with the exception that Role Conflict failed to show significant correlation with extension skill. Agricultural education, extension training, bureaucratic orientation and client orientation all had significant correlations with extension skill at the 1% level or better. Table III summarises the results of the multiple regression analysis for the whole sample and for the local officer and overseas officer samples taken separately.

TABLE IV

Estimates of coefficients and 't' values for Independent Variables Against Extension Skill in Multiple Regression Analysis.

INDEPENDENT VARIABLE	WHOLE SAMPLE		LOCAL OFFICER		OVERSEAS OFFICER	
	(Coef)	(t)	(Coef)	(t)	(Coef.)	(t)
Client Orient.	.36	.88**	.46	1.84**	.55	1.42*
Bureaucratic	-.13	-1.86**	-.14	-.1.63*	-.16	-.1.44*
Extension Tng	1.00	1.43*	1.75	1.62*	.46	.35
Education	.66	1.08	.15	.15	.62	.53
Service	-	-	-.02	-.14	.45	1.85**
Autonomy	.09	.84	-.30	-.1.01	.09	.15
R ²	0.2151		0.2362		0.3019	
Analysis of Variance						
F	5.21**		1.86		2.00	
	(t)	scores	*p < 0.10	** p < 0.05	*** p < 0.01	
	F	scores	*p < 0.05	** p < 0.01	*** p < 0.001	

V. DISCUSSION

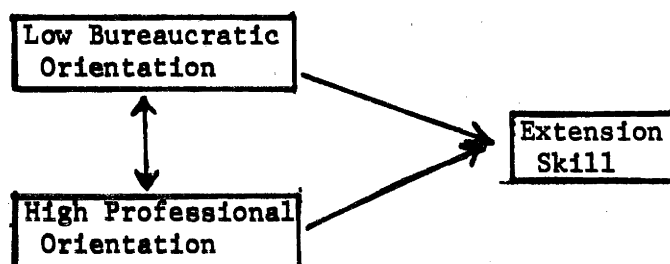
Four of the variables tested were found to have significant zero-order correlations with extension skill. These were bureaucratic orientation, professional orientation, agricultural education and extension training. Service had a marginal level of correlation. The two consequent variables tested, role conflict and dissatisfaction, also had significant zero-order correlations.

Bureaucratic orientation showed the highest zero-order correlation with extension skill. This means that agents with a low level of bureaucratic orientation tended to have higher levels of extension skill. This supports Hypothesis 3A. However, the results do not enable us to say what causes this correlation. Bureaucratic orientation was correlated with all the other variables tested, but only professional orientation, affected the correlation with extension skill. Professional orientation reinforced, but did not explain this correlation.

Professional Orientation also showed a high zero-order correlation with extension skill. This supports Hypothesis 3 B.

Professional orientation was also correlated with other variables, notable bureaucratic orientation and extension training. Multi-variate analysis shows that bureaucratic orientation reinforces, but does not explain the correlation with extension skill.

As Bureaucratic and Professional Orientation are the two most important and variables affecting extension skill we can construct the following causal model:-



This was tested by three-variable analysis and the results are given in Table IV:-

TABLE IV
Three Variable Analysis for Bureaucratic and Professional Orientation and Extension Skill

	EXTENSION SKILL AND LOW BUREAU	LOW BUREAU AND PROFESS.	EXTENSION SKILL AND PROFESS.
Zero-order	+ .62	+ .63	+ .51
Partial	+ .45	+ .44	+ .41
Differential	+ .68	+ .61	+ .58
D - P	+ .23	+ .17	+ .17

The data supports the model. However, four variable analysis did not show any effect by agricultural education and extension training on this relationship. Therefore Hypothesis 4A and 4B are only partly supported.

Agricultural education was correlated with extension skill at a lower level. This correlation is explained by bureaucratic orientation and extension training. Better educated agents are less bureaucratic and have a greater opportunity to undertake extension training and this explains their higher extension skill. Hypothesis 1A is not supported.

Extension training has a low correlation with extension skill. One reason for this could be the wide variety of training experiences that have been grouped together as extension training. Courses during formal pre-service training and in-service training courses were both included.

It might be assumed that the effectiveness of the many different courses varied widely. Extension training was itself correlated with bureaucratic and professional orientation, agricultural education and role conflict. It was negatively correlated with race and service. This meant that officers with higher education, local officers and officers with less service had received greater opportunity to attend courses. It is because extension training was not available when older officers were trained. Statistically bureaucratic orientation and professional orientation both contributed to the correlation between extension training and extension skill as officers who had undergone extension training courses were more likely to be non-bureaucratic and professional in their outlook. The data partly supports Hypothesis 1B.

Race was not related to extension skill. In other words local and overseas extension agents were the same in level of extension skill. Service showed only a marginal zero-order correlation with extension skill. At first glance there appears to be a lack of support for Hypothesis 2.

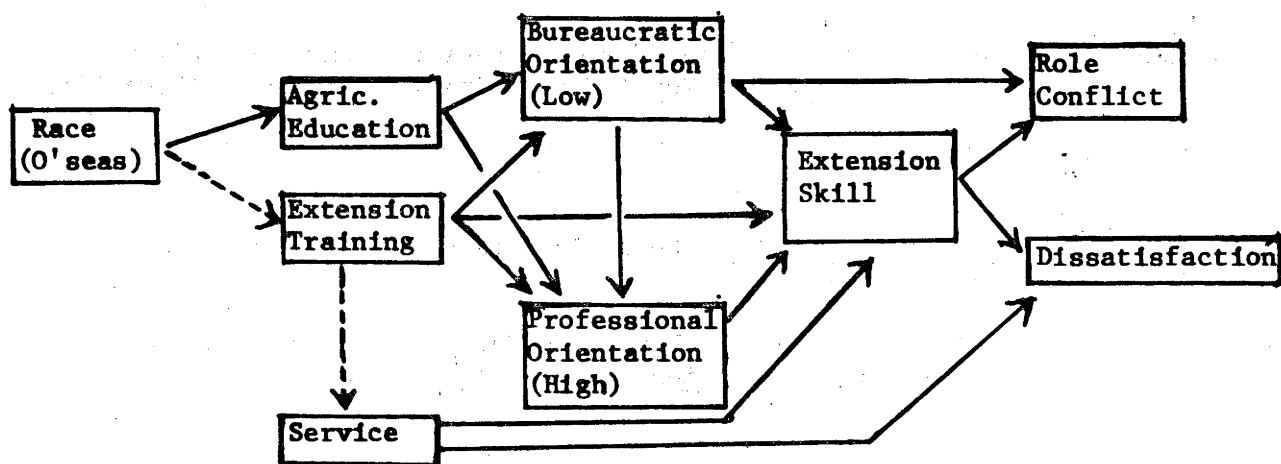
However, the negative correlation with extension training is shown to have a suppressing effect on the correlation. In other words the longer serving officers have had less opportunity to undertake extension training courses. This lack of opportunity explains the low correlation of service and extension skill. Because of this suppressing effect we can say that Hypothesis 2 is supported.

The two consequent variables, role conflict and dissatisfaction index, were both strongly correlated with extension skill. These results support Hypothesis 5A and 5B. Officers with high extension skill find more conflict and dissatisfaction with the present organisational structure than officers with low extension skill. In the case of role conflict this correlation is affected by professional and bureaucratic orientation. The other variables failed to contribute to the relationship between extension skill and dissatisfaction. From observation, however, it appears that this variable is closely related to promotional reward achieved by the individual officer. Officers who had failed to gain promotions were more dissatisfied. As promotional opportunity decreases as you go up the ladder in a hierarchical organisation this would explain the close correlation between dissatisfaction and service.

In summary all hypotheses except 1A were supported. The most important variables contributing to extension skill among those tested were the personality variables related to organisation structure. In short the most skilled extension officer were professionally orientated and non-bureaucratic.

They related to the client rather than the organisation. Because of this they found the present organisation to be non-supportive in their extension work and this was expressed in high levels of role conflict and dissatisfaction with the organisation. Extension skill was increased by extension training and by longer service.

The results can be summarised in the following causal diagram:-



SUGGESTIONS FOR FURTHER STUDY

The present study is essentially a preliminary investigation of a complex area. Both the measurements used and the analysis adopted are relatively crude. Never-the-less the results are of interest in two areas.

First, there is the possibility that measurements of extension skill can be developed. The next step is to test further the validity of the measurement attempted in this study and from these tests to develop such a measure further. If the validity of the measurement is substantiated then it can be applied to extension evaluation in general and the evaluation of extension training in particular.

In the second place the effect of the organisational environment on the effectiveness of extension agents needs further study. The results obtained here given some indication of the type of extension organisation that needs to be developed in order to improve the effectiveness of agricultural extension services. Further studies of these problems would be valuable for those attempting to plan development strategies in rural areas. The suggestion has been made that more sophisticated analysis techniques such as Automatic Interaction Detector Programme (AID) or Multiple Classificatory Analysis (MCA) might be used in such studies.

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APPENDIX I
MULTIPLE REGRESSION ANALYSIS

CORRELATION MATRIX FOR EXTENSION OFFICER SURVEY

	Educ.	Extn. Tng.	Race Local Off.	Bureau	Client	Autonomy	Dissatisf.	Role Conflict	Service	Extension Skill
Education	1.000									
Extn. Tng.	0.44***	1.000								
Local Off.	-0.56***	0.03	1.00							
Bureau	-0.49***	-0.21*	0.30	1.000						
Client	0.32***	0.20*	-0.39***	-0.19	1.000					
Autonomy	-0.01	0.27**	0.44***	0.12	-0.08	1.000				
Dissatn.		0.14		-0.43***	0.22*	-0.12	1.000			
Role Conflict		0.03		-0.26***	0.21*	-0.13	0.21*	1.000		
Service		-0.23**		0.03	-0.05	-0.11	0.02	-0.05	1.000	
Extn. Skill	0.34***	0.28**	-0.23***	-0.33***	0.31***	0.00	0.21*	0.06	-0.03	1.000

one-tailed test

* p < 0.05; ** p < 0.01 *** p < 0.005

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