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**A DECADE OF CHANGE IN THE
JORDANIAN AGRICULTURAL
EXTENSION DEPARTMENT**

By
USAMAH BILBEISI

**AMERICAN UNIVERSITY OF BEIRUT
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JORDANIAN AGRICULTURAL
EXTENSION DEPARTMENT

By
USAMAH BILBEISI

Approved:

Ronald C. Taylor for James M. Kincaid

James M. Kincaid: Former Associate Professor
of Extension at A.U.B. In Charge of Major.

H. J. A. Morsink

Hubert H.J.A. Morsink: Former Associate
Professor of Rural Sociology at A.U.B.

Adnan G. Iskander

Adnan G. Iskander: Assistant Professor of
Public Administration.

F. aldelhel

Fawzi M. Abdullah: Assistant Professor of
Extension.

W. W. Worzella

W.W. Worzella: Professor and Chairman of
Graduate Committee.

Date Thesis is presented: August, 1966.

EXTENSION IN JORDAN

BILBEISI

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AN ABSTRACT OF THE THESIS OF

Usama Bilbeisi for M.S. in Agricultural Extension

Title: A decade of change in the Jordanian Agricultural Extension Department.

A study was undertaken to determine the possible relationship between: on the one hand, the organizational and operational changes within the Jordanian Agricultural Extension Department (JAED), and selected socio-economic conditions in rural Jordan, and on the other hand, the actual performance of the JAED as represented by total contacts made between the JAED and rural people, and the number of times each extension method was used during the period 1954 through 1964. Data were collected by reviewing official documents of the JAED and other governmental agencies in addition to a review of literature which was conducted to determine the technical, sociological, and organizational aspects of the use of extension methods. Data were analyzed as to their ratio of change greater than the base year of 1954. To carry on the study, 6 hypotheses were formulated and tested to see whether or not any increase in the staffing of JAED with advisors and specialists, training advisors about the use of extension methods and technical subject-matter, number of farmer cooperatives' members, and number of agricultural credit borrowers, would have a similar increase in the number of total contacts between the JAED and the rural people of Jordan and in the number of times each extension method was used. Data acquired did not confirm the hypothesized expectations and no similarities between the variables under study for the total period under study were observed. Nevertheless, there were observed similarities in trends of change between variables under study, but for partial periods of time. Hypotheses that showed greater tendency toward positive acceptance were those of agricultural credit borrowers, and number of days of subject-matter training. The hypotheses that showed least tendency toward positive acceptance were those of staffing the JAED with extension subject-matter specialists and number of members of farmer cooperatives. The unexpected non-conformity of the hypotheses to the findings of the study might be explained by lack of specificity in

data collected, the absence of some other variables of significance, interaction between variables, and climatic fluctuations. Certain recommendations were formulated for the consideration of the JAED administrators, encompassing policy recommendations and areas of further research.

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I. INTRODUCTION

Purpose of the Study

The purpose of this study was to test six hypotheses concerning the possible relationship between:

on the one hand the increased capacity of the Jordanian Agricultural Extension¹ Department (JAED)² for providing agricultural extension services as represented by the number of:

- (1) extension advisors³,

-
1. Extension refers to an out-of-school system of education where adults learn by doing. Kelsey and Hearn (1955, p. 1).
 2. JAED or the Jordanian Agricultural Extension Department refers to the educational department of the Ministry of Agriculture in Jordan.
 3. The term "advisor" refers to the employee appointed by the JAED to work in a limited area comprising a number of villages according to population density and transportation facilities, and whose duties are to execute the educational programs of the JAED. (Official JAED memo, No. A/171194, dated 2/2/1962).

- (2) extension subject-matter specialists¹,
 - (3) days devoted to training advisors about methods of extension teaching, and
 - (4) days devoted to training advisors about technical subject-matter in agriculture,
- and the increased demand for agricultural extension services as represented by the number of:

- (1) members of farmers cooperative associations, and
- (2) borrowers of agricultural credits,

and on the other hand, the actual operational performance of the JAED as represented by the number of:

- (1) total contacts made between the JAED and the rural population, and
- (2) kinds of teaching methods² and number of times each extension method was used.

1. The term "Specialists" refers to those members of the extension staff members charged with the duties of keeping the field level extension workers informed on research developments and interpret data so that it may be applied towards the improvement of farm, home, and rural conditions. The specialist performs a staff function and is not responsible for administrative matters. Kelsey and Hearn (1955, p. 43).
2. Teaching methods are "... the techniques and procedures used by the teacher in teaching and the learner in learning, that will produce the desired changes and results most sufficiently; with a minimum waste of time and energy". Mueller (1937, p. 38).

Background and Situation

Development of Extension work in Jordan from 1953 to 1957 included the following stages. An agreement was signed in 1953 between the government of the Hashemite Kingdom of Jordan and the United States of America Point IV program. The agreement stipulated that Point IV would furnish technicians and funds to aid the Jordanian Government in the establishment of an agricultural extension service:

Prior to 1953, the Jordanian Ministry of Agriculture employed agricultural officers to work in each administrative area of the country¹. The responsibilities of these officers were primarily divided among regulatory and service duties. Advisory work was incidental to the performance of regulatory and service tasks. Educational programs were not integral parts of the Ministry's activities before 1953. With the advent of the 1953 agreement, an agricultural extension service was institutionalized as part of the Jordanian Board of Development, a semi-autonomous public agency.

In 1957, the Jordanian Ministry of Agriculture assumed direct responsibilities of agricultural extension work. At that time, the extension field level workers

1. An administrative area in Jordan is a political sub-division called a "Mutasarrifiah".

functioned more as community development workers than as agricultural extension advisors. For example, their duties included the following kinds of activities:

1. Adult education, i.e., literacy education.
2. Water resources development.
3. Road construction.
4. Organization of cooperatives associations.
5. Soil conservation, chiefly terracing, to control erosion and reclaim land for cultivation.
6. Diffusion of new or improved farm practices.

By way of contrast, the "Mutasarrifiah's" agricultural officers continued to perform their previously assigned regulatory and service functions. For example, they performed the following tasks: (1) control and regulation in the form of (a) providing technical advice to local courts regarding disputes over land ownership and crops' damage, (b) providing public agencies with agricultural data for purposes of taxation and census reports, and (c) participation in ad-hoc committees established to distribute feeds and supplies in emergency times, (2) services in the form of (a) distributing fruits and forest trees seedlings, (b) providing farmers with seeds of crops and vegetables, and, (c) spraying and dusting farmers' crops to control pests, and (3) advisory work, but only through laws and regulations and not as an integral part of the

agricultural officers duties.

Development of the Extension work in Jordan from 1957 through 1964 included the merging of the extension service, known officially at the time of merging as Rural Development Department, into the Ministry of Agriculture in 1957 with some extension workers receiving official service classification. Those newly classified extension workers were assigned to various regions of Jordan with the responsibilities of conducting educational programs as well as other administrative tasks among the rural population. They were designated as "agricultural extension advisors" to distinguish them from the agricultural officers of the Ministry. However, an important problem was encountered at that time; the experienced agricultural officers (who had joined the Ministry prior to 1953) found it difficult to change their patterns of job performance from one of emphasis on regulations and service to one of teaching and advising which was at that time fully accepted by the Ministry's administrators as the new pattern of the activities of the Ministry of Agriculture. Both the newly classified extension workers and the experienced agricultural officers were required by the Ministry to plan and execute educational programs. To counteract the teaching skills' deficiency of the "agricultural officers" and the administrative skill's deficiency of the newly appointed extension advisors, the Ministry in 1957 began a series of

training programs for all the field level employees. The subject matter of these training programs included extension teaching methods and administrative skills.

Another organizational change was instituted in 1958; a separate Extension Division was established within the Ministry of Agriculture. It was assigned full responsibility for all recently appointed extension workers. Three years later, this Extension Division was combined with the then Rural Development Department to form the fourth department in the Ministry of Agriculture¹.

In 1962, all advisors who had not experienced agricultural training in their pre-service training were transferred from the Ministry of Agriculture to the Ministry of Education to work as school teachers. They were replaced by graduates of agricultural secondary schools and consequently the Extension department was designated as Agricultural Extension Department. A further change in the organization of JAED was the transfer of Home Economics advisors to the Ministry of Education to work also as school teachers.

Thus, by the end of 1964, the extension service of Jordan had undergone many structural and administrative changes. It had emerged as an agency of government with a primary responsibility for planning and implementing

1. The other three departments of the Ministry of Agriculture are: Forestry, Veterinary services, and Research.

educational programs among the rural population of Jordan.

Statement of the Problem

The situation briefly described above implies that a considerable effort has been expended to develop an effective extension service. It is reasonable to assume that the main purpose of these efforts has been to encourage agricultural development in Jordan. For example, one of the purposes of adding more staff to the JAED has most likely been to expand contacts between the JAED and the rural population. In turn these expanded contacts should have provided greater opportunity for agricultural development.

Since no formal evaluation of changes made in the JAED or of results it achieved during the period 1954 through 1964 had been attempted, it was decided to undertake a study to explore changes in the capacity of the JAED to provide extension services and also changes in the demand for extension services; and on the other hand to explore changes in the actual operational performance of the JAED. Due to limited time allocated to the undertaking of this study, no attempt was made to measure results in terms of agricultural development statistics. Likewise, only a few of many possible internal organizational and external social and economic changes were selected.

In conclusion, a two-fold problem was defined as a preliminary evaluation of the JAED. First, there is need to determine what changes have been made in selected aspects of the JAED's organization and what trends are evident in certain aspects of rural social and economic conditions. Second, it is important to ascertain whether changes in extension teaching methodology and in the extent of contacts between the JAED and the rural population of Jordan tend to indicate what might be expected in response to the organizational and socio-economic changes.

Statement of Objectives

The following objectives were used as guides to the conduct of the study:

1. Undertake a review of selected literature to determine:
 - a. technical and sociological aspects of extension education as a teaching-learning process and
 - b. existing information about the effect of extension organizational adjustments and socio-economic conditions on the selection and use of extension methods.
2. Determine what changes have occurred in the JAED during the period 1954 through 1964, including the following:

- a. number of advisors,
- b. number of specialists,
- c. kinds of methods used,
- d. number of times each extension method was used, and
- e. number of contacts made between the JAED and the rural population,

3. Determine social and economic changes in rural Jordan during the period 1954 through 1964, including the number of:

- a. members of farmer cooperative associations, and
- b. borrowers of agricultural credit,

4. Tabulate and interpret data and present findings relative to each hypothesis,

5. Draw conclusions regarding the acceptance or rejection of the hypotheses,

6. Formulate recommendations for the consideration of administrators of JAED and suggestions of problems of further research.

Significance of the Study

It is believed that this study, though limited by certain considerations which are explained later in the "Methodology" chapter, has provided a useful preliminary evaluation of the extension methodology employed by the JAED. The determination of changes alone has provided a

compilation of information which had not been reported before. In addition, the analyses of trends in these changes for the period 1954 through 1964 has yielded new insights which should prove useful to those who are responsible for planning the continued growth and effective development of the JAED.

II. REVIEW OF LITERATURE

Introduction

This chapter was prepared to establish a background of concepts and research findings which clarify and support the bases for the study. Literature of Extension and related disciplines was reviewed. Important concepts were described and interrelated to give meaning to the major variables that were investigated. For example, Extension is defined as an educational process of teaching and learning which requires the careful selection and application of methods, a variable under study.

Since the study was conducted as a partial and preliminary evaluation of the JAED, the place of evaluation in determining the effectiveness of Extension work was also set forth. This concept was described to further clarify the scope and limitation of the research effort.

Other variables investigated included socio-economic changes in Jordan for the period under study. Thus, concepts of sociological change were reviewed¹ to provide an understanding of their importance in the conduct of an Extension educational program.

1. See Appendix A p.

Extension Teaching Methods

Fenley and Williams (1962, p.1) define "communication" as the process by which information and ideas are consciously shared between two persons or between one person and a group. Thus, one cannot teach if he cannot communicate. When an Extension worker interacts with villagers, he does so from a position of representing subject-matter information accumulated by scientific research and years of extension experience. The Extension worker must decide on the technical subject-matter to be taught to the farmer. When the interest of farmer is aroused, the Extension worker must use a certain manner in giving advice to the farmers. The various ways by which interest is aroused and advice is presented to farm people are termed Extension teaching methods.

It is reported by Penders (1956, p.143) that communication with farm people is achieved through stimulation of their sense mechanisms, i.e., seeing, hearing, touching, smelling, and tasting. The more of these senses stimulated in a given learning situation, the better will be the contents of the message received. In general, only a material object will stimulate all senses mechanisms at one time. However, advisory work often does not deal with material objects alone, but with ideas and experiences. Thus, Extension workers need to be creative in using methods in a manner that will appeal to as many

senses as possible.

To attain this purpose, the advisory worker has four fundamental media at his disposal; the spoken word, the written word, the real object, and the picture or other visual means.

Types of contacts utilized in Extension work: According to Wilson and Gallup (1955, p. 4), the methods employed in extension teaching may be classified in several ways. Regardless of the classification, the practice of teaching and the situations of learning frequently involve the associated use of two or more kinds of teaching methods. Consequently extension methods are grouped according to the number and nature of contacts inherent in their use as follows: (see Table 1).

Table 1. Extension methods classified according to use¹.

Individual contacts	Group contacts	Mass contacts
Farm and home visits	Method demonstration meetings	Bulletins
Office calls	Leader training meetings	Leaflets
Telephone calls	Lecture meetings	News stories
Personal letters	Conferences and discussion meetings	Circular letters
Result demonstrations	Meetings at result demonstrations	Radio
	Tours	Television
	Schools	Exhibits
	Miscellaneous meetings	Posters

1. Wilson, M.C., and Gallup, G., Extension Teaching Methods, Extension Service Circular 495, August 1955, Federal Extension Service, U.S.D.A., p.4.

In addition to the conscious dissemination of information through the various methods available to the extension teacher, the indirect spread of information resulting from specific activities and from the total teaching effort is very substantial.

Another classification of extension methods was reported by Wilson and Gallup (1955, p.5) by having extension methods classified according to form (see Table 2).

Table 2. Extension methods¹ classified according to form¹.

Written methods	Spoken methods	Objective or visual method
Bulletins	General and special meetings of all kinds.	Result demonstrations.
Leaflets		Exhibits
News articles	Farm and home visits	Posters
Personal letters	Office calls	Motion pictures, charts, slides and other visual aids.
Circular letters	Telephone calls	
	Radio	

1. Wilson, M.C., and Gallup, G., Extension Teaching Methods, Extension Service Circular 495, August 1955, Federal Extension Service, U.S.D.A., p.5.

In addition to the above extension methods, method demonstration meetings, meetings at result demonstrations, meetings involving motion pictures, charts and other visual aids and television fit under spoken methods and objective methods. Moreover, indirect influence fits in the three types of methods.

Effectiveness of Various Extension Methods

The term "effectiveness" is defined by the American College dictionary (1964, p.383) as "... producing the intended or expected result".

"Effectiveness" of Extension methods: Wilson and Gallup (1955, p.10) point out that the term "effectiveness of extension methods" denotes whether extension teaching procedures produce the desired results and whether some change in behavior attributable to extension teaching has taken place. However, it is difficult for the extension worker, as an educator in a rather informal educational process, to ascertain the number of individuals benefiting from his educational programs. In this context, the definition of K.F. Warner (1950, p.1) that "Effective teaching is the transfer of facts, skills, and attitudes so that they are understood, learned, remembered, and used", might be helpful in illustrating what is meant by the "effectiveness" of Extension methods. Warner goes on to indicate that "... if there has been no change in behavior,

there has been no real learning". Thus, the core idea in the "effectiveness" of extension methods is whether change in behavior has been produced and to what extent and of how much coverage.

Significance of the "effectiveness" of Extension methods

to Extension work: Wide socio-economic gap exists between developed and under-developed countries on the one hand, and between the scientific and administrative elite and the rural masses on the other. Extension is one means of helping to close that gap. Ever changing economic and social conditions make more difficult the task of the Extension worker for he must keep abreast of such changes and include them in his gap-narrowing programs.

An important companion element of an effective Extension program involves reviewing its educational activities from time to time to determine whether "change" has been produced and to what extent. This kind of reviewing or evaluation of the whole Extension process can pin-point to the Extension analyst the points of strength and weakness in the teaching methods which are the tools of the educational program, and thus the capabilities and limitations of the various teaching means can be revealed. Moreover, the very achievement of "change", regardless of the amount, provides a change in the socio-economic conditions of the client system which inevitably requires re-examination of the teaching media in order to cope with

the new conditions. Thus, the Extension process can be kept dynamic and up-to-date.

Actually, "effectiveness" is a rather specific designation of the more commonly used concept of "Evaluation". Thus, before proceeding to the practical aspects of the effectiveness of Extension methods, a brief discussion of "Evaluation" is appropriate.

← Evaluation in Extension work: Raudabaugh in Byrn, (1959, p.7) defines extension evaluation as the process of determining how well desired behavioral changes have taken place or are taking place as a result of extension educational efforts. The following briefly explains the significance of evaluation to the process of extension education:

1. Evaluation is the process of trying consciously and objectively to determine whether certain activities actually did lead to the results that were anticipated,
2. Evaluation is essential to making periodic checks on the effectiveness of educational programs and to deciding where improvements are needed.
3. Evaluation gives a feeling of security to the Extension worker who is doing a good job.
4. Comprehensive evaluation can provide the public with concrete evidence of the soundness of the Extension work and thus keep the public opinion in a continuous support.

5. Scientific evaluation provides the extension worker with a professional attitude; he may therefore, be inclined to adopt a more scientific approach in his future undertakings.

Mathews in Byrn (1959, p.11) states that evaluation has two stages as follows:

1. Stage of Means Evaluation which refers to the study of arrangements and procedures for doing Extension work.

2. Stage of Ends Evaluation which refers to the study of changes in knowledge, understanding, attitudes, skills and abilities of the people who are affected by the Extension educational program.

Effectiveness of extension teaching methods measured: As a principle, Wilson and Gallup (1955, p.10) report that improvement in the use of methods in extension teaching implies the necessity of making measurement; hence valid evidence of a reliable and objective nature must be substituted for unsupported opinion and wishful thinking.

For the extension worker, the number of office calls, farm or home visits, bulletins distributed, attendance at meetings, 4-H club members, etc., provide some evidence of the number of people benefited by the extension effort. It is on this type of "measurement of effectiveness" that this study has focused.

Ascertaining the number of people who read extension information articles, or who listen to an extension radio

program involves sampling the potential audience. These data too indicate the extent of coverage of extension teaching efforts.

As mentioned above, unless some change in the behavior attributable to extension teaching has taken place, the individual farmer has not learned and the extension worker has not taught.

The informal nature of extension education makes it difficult to obtain satisfactory evidence of resulting changes in the audience. Since extension clientele are part of actual life situations where the knowledge learned can be put to use on the farm or in the community, the extension worker can ascertain with a considerable degree of certainty when a real change has resulted from the teacher-learner relationship. The critical point is to discover the evidence of change, and whether it was due to extension teaching or to non-extension sources.

Census data are potential sources of Extension information, but often such data lack the preciseness required for Extension evaluation. Rural people themselves can supplement the needed data in shedding light on the Extension effort that influenced them to make the reported changes. The personal interview survey of the extent to which farmers have adopted improved practices in response to Extension stimuli is a practical scientific device for measuring the success of the teaching effort. It is also

useful in evaluating the methods of teaching employed by extension workers. The combined data from such studies provide insight into the effectiveness of methods of Extension under practical conditions.

Because of the nature of socio-economic change, most new practices require several years before wide spread adoption occurs. Also, the measurement of the degree and rate of change is best made as a longitudinal study over several years duration.

Effectiveness of extension teaching methods compared: According to Wilson and Gallup (1955, p.11) the effectiveness of the various extension teaching methods can be evaluated in terms of (1) the success of the method in influencing people to make the desired changes, and (2) the amount of teaching effort expended on it, i.e., time devoted to the method and frequency of use and its cost.

The total influence for change for a particular means of teaching may be large because of the emphasis placed upon it in the teaching plan. For example, the large influence of the method demonstration meetings in home demonstration work is accounted for by its extensive use by home demonstration agents, and vice versa. This fact explains the relatively small influence of the home visits in changing home economics practices.

A unit of time devoted to a particular method of teaching may yield much larger returns than a comprehensive

amount of effort expended on some other teaching method. The news story, the radio program, and the circular letter are striking examples of large returns per unit of time devoted to these means of teaching. Conversely, exhibits and the result demonstrations are examples of teaching methods that influence relatively few people per unit of extension agent's time.

The combined effectiveness of two or more methods used to complement each other may be greater than the sum of the effectiveness of the same methods employed separately.

Determining the influence and cost of the methods used in extension teaching with a satisfactory degree of accuracy is difficult because of the informal nature of extension work. Also the numerous opportunities of teaching available to rural people other than official extension work are complicating factors.

Effectiveness of various Extension methods in relation to influence: The relative influence of various Extension methods in the U.S. is discussed by Wilson and Gallup (1955, p.22). Table 3 reports the findings of a study of 32 samples from 27 states involving the adoption of 44,788 practices by farmers and homemakers from 15,424 farms and homes.

Table 3. Relative frequency with which Extension methods were reported as having influenced the adoption of improved practices¹.

Extension method	Percentage of practices adopted
Indirect influence	19.0
Method demonstration meetings and leader training meetings	18.2
General meetings	14.6
Farm and home visits	10.8
News stories	9.7
Bulletins	8.5
Office calls	6.5
Result demonstrations	6.1
Circular letters	3.0
Radio	1.2
Correspondence	1.1
Exhibits	0.9
Telephone calls	0.3

1. Wilson, M.C., and Gallup, G., Extension Teaching Methods, Washington, D.C., 25: Extension Service Circular No. 495, U.S.D.A., 1955, p.13.

Effectiveness of extension methods in relation to cost:

The costs of employing the various extension methods is an important issue especially for the underdeveloped countries where shortage of funds may be extreme. Research findings in the U.S. show (see Table 4) that the ratio of practices adopted to the cost of using a method varies considerably for the different methods.

Table 4. Relative costs and influence of different extension methods¹.

Method	Percentage of funds devoted to method	Percentage of improved practices accredited to method
Method demonstrations	19.6	20.5
Result demonstrations	17.2	8.1
Farm and home visits	13.7	15.4
General meetings	13.3	19.0
Bulletins	6.2	8.6
Office calls	5.4	8.4
News stories and radio	4.9	14.6
Exhibits	4.2	0.8
Correspondence	4.2	1.8
Circular letters	1.3	2.3
Telephone calls	1.1	0.5

1. Wilson, M.C., and Gallup, G., Extension Teaching Methods, Extension Service Circular 495, August 1955, Federal Extension Service, U.S.D.A., p. 17.

Since no extension costs can be charged against indirect influence, the practices credited to the indirect influence from one neighbor to another have been distributed among the direct teaching methods utilized by extension agents.

Summary

Extension is an educational institution. It is dedicated to teaching rural people in a manner conducive to their learning new or improved ways of farming and living. Thus, Extension education consists of two inter-related processes. Teaching is the process of creating situations conducive to learning. Learning is a self-initiated process through which people acquire changes in behavior.

Since learning implies self-development, teaching is the related process of helping to stimulate and guide learning in a purposeful and progressive way. Therefore, teaching and learning are interrelated processes which, together, produce an educational response. The teacher enlightens the learner of new information and skills which he may adopt as a change in behavior from that which he previously practiced.

Extension workers function as teachers as they plan and present educational programs in agriculture, home economics, and youth work. The rural people who

participate are the learners. To be an effective teacher, an extension worker must first stimulate and arouse the desire for learning among his clientele. They, the extension workers, must then convince rural people that a new behavior is not only possible but should be adopted as a means to improve the social and economic conditions under which they live.

Changes of learners' behavior sought by Extension teachers are those associated with attitudes, knowledge, skills, and understanding. To achieve such changes, the learner should hear, see, and above all use new ideas, information, and abilities which the teacher provides in learning situations. Thus, the extension worker must learn and apply teaching methods which communicate these new ideas, information, and abilities in a way that learners will adopt them as their own.

III. METHODOLOGY

Introduction

It was stated in chapter I, that the purpose of this study was to test 6 hypotheses concerning the possible relationship between: on the one hand the increased capacity of the JAED for providing agricultural extension services and the increased demand for such services, and on the other hand, the actual operational performance of the JAED during the period 1954 through 1964.

Six hypotheses were developed as the bases for the research design. It was proposed in these hypotheses that if certain organizational changes took place within the JAED or if selected socio-economic changes had taken place in the rural areas of Jordan, then it was expected that similar changes would also have occurred in the number of contacts between the JAED and the rural population and in the number of times various extension methods were used by the JAED.

Statement of Hypotheses; Their Rationale

Hypothesis 1: If the number of extension advisors had increased from 1954 through 1964, it was expected that there would be similar growth in the number of contacts

between the JAED's advisors and the rural population and in the number of times each extension method was used.

The rationale for this hypothesis is that the extension advisors in the JAED, for the years 1954 through 1964, were those staff members who were assigned the primary responsibility for working with farm people of Jordan to facilitate their adoption of new and improved practices. Thus, it appears reasonable to expect that any increase in number of advisors would be accompanied by a similar trend of increase in number of contacts with the rural population. Penders (1956, p.24) states that whenever extension staff is larger, individual contacts tend to be larger as well as group contacts and that mass contacts should supplement the 2 foregoing methods which also justifies the presumption that an increase in the number of advisors would reveal a similar increase in the number of times each extension method was used.

Hypothesis 2: If there was an increase in the number of extension specialists during the period 1954 through 1964, it was expected that there would be a similar growth in the number of contacts between the JAED specialists, and the rural population and in the number of times each method was used.

Extension specialists are the staff members of an extension service who are charged with keeping abreast of the advancing technology of their specialized fields; e.g.,

agronomy, soils, animal science and the like. In this capacity, they help advisors plan the educational programs to be conducted with farm people. In addition, they prepare publications to be distributed among the advisors and farmers in matters related to their specialized areas of agriculture. Specialists also serve as trainers of advisors in the subject matter to be taught to farmers and they visit farms at the advisor's request to help solve problems that arise. Thus, it seems reasonable to assume that an increase in the number of specialists, at least in the beginning years of an Extension Service as the JAED, should enhance confidence in their ability to help farmers. Also, the availability of specialists to visit individual farms or meet with group of farmers to discuss problems and their possible solutions is another factor in the success of an extension program. It was reported by Clark in Sanders et al. (1966, p.40) that an increase in the number of subject-matter specialists available to extension workers would enhance their ability to contact more farmers.

Another aspect of the specialists' role is the guidance of the local level advisor in the use of teaching methods. A specialist has the responsibility to help the advisor select and use those methods which are most likely to increase farmer's adoption of recommended practices. Thus, an increase in the number of specialists should, in a beginning Extension Service such as the JAED, facilitate

an increasing use of the numbers of teaching methods employed.

Hypothesis 3: If the total number of days devoted to training advisors about the use of teaching methods increased during the period 1954 through 1964, it was expected that there would be a similar growth in the number of contacts between the JAED and the rural population and in the number of times each method was used.

An objective of training in extension teaching methods is to improve an advisor's ability and confidence in working with farm people. In-service training provides the necessary encouragement and expert guidance for the advisors to develop their skills and abilities to their maximum. Thus, it was assumed that an increase in days devoted to in-service training of advisors about teaching methods would enhance their use of different methods and their contacts with the rural population. Fenley (1960, p 7) supports this assumption as follows; "as the worker becomes more proficient in the use of extension skills he will be able to extend the program to more people, making maximum use of available time".

Hypothesis 4: If the number of days devoted to training advisors about technical subject matter increased during the period 1954 through 1964, it was expected that there would be a similar growth in the number of contacts between the JAED's advisors and the rural population of Jordan and in the number of times each method was used.

" The essential qualifications of an extension worker must include first of all a sound practical knowledge of agriculture and farm life The second requirement is adequate technical training".
and further:

" Extension services also have a responsibility to keep their workers informed of new developments in technical agriculture and improvements in methods of extension teaching".

The above quotations from Maunder (1954, pp. 24-25) emphasize the importance of in-service training of advisors about technical subject matter and teaching methods. Such training improves the advisors' confidence and ability to work effectively with farmers. Thus, as the emphasis on subject training increases, it appears reasonable to expect that numbers of contacts and the methods used to make those contacts would also increase.

Hypothesis 5 stated that if the total number of farmer cooperatives members increased during the period 1954 through 1964, it was expected that there would be a similar growth in the number of contacts between the JAED and the rural population and in the number of times each method was used.

Agricultural extension has been previously defined as an agency of government charged with educating farm people about new and improved agricultural and home making

practices. One of the problems faced in such programs centers on the availability of equipment and materials needed to implement recommendations of extension advisors. Several countries that have recently begun to develop their extension services have found that inadequate supplies of production requisites represent an obstacle to farmers' realizing the benefits of extension education.

The government of India has started an intensive agricultural district program for accelerating agricultural production. F.A.O. (1965, p.2) reports that there are two among several objectives of the program; namely, (1) providing adequate and timely supplies for production such as seeds, fertilizers, implements and pesticides through cooperatives, and (2) achieving intensive education of farmers in better farming techniques.

F.A.O. (1965, p.1) gives the following reason for these objectives:

In the final analysis, it is the farmer who, by the application of research results is to produce more and better food at reduced cost In order to do this successfully, a number of measures have to be taken into consideration. First of all, there must be a supply of suitable production requisites, such as seeds, fertilizers,

insecticides and improved farm implements, that farmers can use to their advantage. And these supplies must be made available in time in suitable amounts, on reasonable terms, and within easy reach of farmers.

It is indicated also by F.A.O. (1965, p.1) that without agricultural research, agricultural extension, and certain other institutions of farmers such as cooperatives, "farmers, particularly small farmers, are helpless".

Thus, it seemed reasonable to hypothesize that an increase in farmer cooperative members in Jordan (assuming their membership in a cooperative contributes to solving a "lack of sources of supply" problem) would facilitate more effective extension work. Part of the expression of greater effectiveness of the work should appear as an increase in contacts between Extension and the rural population and in the kinds of methods used, particularly as regards group contacts. Hypothesis 6 stated that if the number of users of agricultural credit increased during the period 1954 through 1964, it was expected that there would be a similar growth in the number of contacts and in the number of times each method was used.

Many simple but significant improvements in farming, such as cleaner cultivation, can be installed by the poorest farmers without money outlay. Many other desirable practices, such as the use of improved seeds or plant pesticides, require cash expenditure - perhaps only \$10 or \$20 per season but still beyond the present incomes of most farmers in underdeveloped areas.

Hence a system of agricultural credit for small borrowers is a must for substantial expansion of farm output in Africa, Asia and Latin America. At present these small farmers must depend entirely upon private money lenders who often charge interest rates as high as 100 percent and sometimes more. One reason for the excessive interest charges is the unproductive use of credit by the farmers. This makes technical supervision a necessary part of a sound credit program. Thus the establishment of an extension service goes hand in hand with credit".

These statements were reported by I.C.A. (1959, p.13). Credit is widely recognized as an essential component of agricultural development. Thus, it is not only necessary that farmers have a timely service of supply of production requisites, but also the financial resources to purchase them. Since many farmers, particularly in the developing countries of which Jordan is an example, can not

readily accumulate cash resources to hold them over from the beginning to the end of production cycles, they are in need of timely and reasonable sources of credit.

It was with the belief, then, that increasing numbers of credit borrowers should reflect greater desire and ability among farmers to seek and use extension's services that hypothesis 6 was formulated.

Collection of data: With the foregoing hypotheses as a guide, the writer formulated a "data collection device" for recording factual information about the variables under study. A copy of the data collection device is included in the thesis as Appendix B.

During September 1965, the writer returned to Jordan where he spent approximately 4 weeks searching through various reports and records of the JAED, the co-operative union, agricultural credit corporation, and other agencies and organizations. For each of the years 1954 through 1964 data were recorded about extension methods and contacts, numbers of extension advisors and specialists, days devoted to methods and subject training, and numbers of farmers who held cooperative membership and who borrowed money on credit.

The possibility of errors in the data from these historical documents is recognized. For example, agencies which are evolving in their institutionalized patterns of operation may also be changing from year to year in their

system of reporting as well as in what is being reported. That is, the bases for recording the statistics of the organization or agency may vary over time. Such variation would tend to reduce comparability of the reports from year to year.

Though the researcher recognized these inherent problems in sources of data, several factors contributed to his decision to conduct the study using the data. Such factors follow: 1. these statistics are the only available sources, and 2. the reports, as used, represent the official records of the agencies involved. Since the reports are official, they are also the sources upon which administrators rely for significant part of the information needed in making their organizational and operational decisions. Therefore, the official records, of the JAED and other agencies involved, are the most appropriate sources of information for the achievement of our analyses.

Analyses of data: Information recorded during the collection of data was tabulated and appears in tabular form in chapter IV.

To accomplish the comparisons suggested in each of the study's hypotheses, further analyses were required. It was deemed desirable that trends of change on all variables should be computed such that each could be readily compared with the others. To achieve this comparability, it was decided that data recorded for the first

year of organized extension work would be considered as the base or index year. Thus, data on all variables for the year 1954 were assigned the index of 1.00. Data for the years 1955 through 1964 were then computed as ratios of change from the 1954 level. These analyses provided the desired comparability and were utilized in the presentation of findings about each hypothesis. For example, the number of extension advisors in 1954 was 20. In 1955, the reports indicated that there were 29. Thus, the year 1955 revealed a 45 ratio increase in advisors over the index year of 1954. The ratio of change was computed as 1.45, i.e., there were nearly 1.5 times as many advisors in 1955 as had been employed by the JAED in 1954.

Findings are summarized in Chapter V by means of a different technique, namely one which reflects the percentage of acceptance for each hypothesis and sub-hypothesis. For example, if the relationship suggested by a certain hypothesis was positive for 5 years out of the total 11 years period of study, it will be reported as having a rate of acceptance of 45 percent. (see Table 9).

Summary

The methodology of the study included specifying, in the form of 6 hypotheses, the variables to be studied and the bases for their analyses. With these hypotheses as a guide, the data were collected from official records

of the JAED and other relevent organizations. These data were tabulated and analyzed. The findings are reported in Chapter IV.

IV. RESULTS AND DISCUSSION

Introduction

For the purpose of carrying on the study, selected variables were analyzed as to their trends of change during the period 1954 through 1964. These variables were: Changes within the JAED included organizational and operational aspects and the actual performance of the JAED.

The organizational changes studied were those of staffing the JAED with extension advisors and subject-matter specialists. Data were tabulated as absolute figures and recorded in Table 5. They include also the training of extension advisors as represented by the number of days devoted to extension methods' training, and number of days devoted to technical subject-matter. Data were recorded in Table 5.

The operational changes included the extension teaching methods employed by the JAED and the number of contacts made between the organization and the rural population. Table 6 shows the number of times each method was used, the number of contacts made with rural population, and the total number of contacts for each year of the period under study.

Changes external to the JAED included socio-economic

Table 5. Data collected, organizational and socio-economic variables, 1954 through 1964.

Year	Staffing		Training		Farmer cooperatives	Agri-cultural credit borrowers
	<u>No. of</u>		<u>No. of days of</u>		No. of Members	No. of
	Extension advisors	Extension specialists	Extension methods	Subject matter		
1954	20	7	14	4	2000	11500
1955	29	5	33	1	4500	13600
1956	28	5	7	9	6100	9800
1957	34	6	9	2	7500	12800
1958	42	8	54	-	11300	21900
1959	34	6	19	6	10300	28300
1960	34	4	-	7	12600	24300
1961	36	4	30	-	13000	17800
1962	97	12	55	8	12900	14400
1963	85	7	-	-	12200	15700
1964	82	8	6	33	14600	13800

Table 6. Data collected, operational variables, 1954 through 1964.

Year	EXTENSION METHODS										Total contacts
	Farm visits		Office calls		Method demon's		General Meetings		Planning meetings		
	Times used	Con-tacts	Times used	Con-tacts	Times used	Con-tacts	Times used	Con-tacts	Times used	Con-tacts	
1954	1.5	1.5	9.5	10.0	0.5	9.0	0.5	5.0	0.8	4.0	29.5
1955	4.5	9.0	11.9	23.8	1.0	13.9	2.6	35.4	1.4	7.4	89.5
1956	7.6	15.2	13.7	13.7	1.6	18.0	4.6	66.5	3.0	15.0	128.4
1957	8.9	26.7	21.2	42.3	3.0	43.0	7.2	96.9	1.0	5.0	213.9
1958	8.9	17.8	21.2	63.5	3.0	43.0	5.2	20.9	1.7	9.0	154.2
1959	5.2	15.6	30.2	30.2	1.8	41.4	5.4	88.7	1.5	7.7	183.6
1960	6.4	19.3	25.0	50.0	2.2	27.2	4.3	46.6	0.7	3.6	146.7
1961	2.6	7.7	4.7	14.1	1.0	9.3	1.9	17.9	---	---	49.0
1962	14.0	28.0	9.3	27.9	3.3	24.8	8.7	61.6	---	---	142.3
1963	12.0	36.3	8.9	26.6	2.6	16.8	7.6	52.3	---	---	132.0
1964	8.2	24.5	9.2	18.5	1.8	12.2	4.3	26.7	---	---	81.9

(----- in thousands -----)

trends which occurred in rural Jordan during 1954 through 1964.

Cooperation. Changes in number of members of farmer cooperatives were tabulated in Table 5.

Agricultural credit. Changes in the number of borrowers of agricultural credit were tabulated in Table 5.

Thus, the data in Table 5 were analyzed in relation to data in Table 6 about methods, i.e., number of times each extension method was used, and contacts made between the JAED and the rural population of Jordan.

Findings

Hypothesis I: If the total number of extension advisors increased during the period 1954 through 1964, it was expected that there would be a similar growth in the number of contacts between the JAED and the rural population and in the number of times each extension method was used.

Ratios of change in the number of advisors are shown in Table 7 and in Figure 1. The ratio of change value was computed to show differences in the number of advisors employed by the JAED for each of the years 1955 through 1964 as compared to the first year of 1954. The ratio of change was determined to further emphasize the magnitude of these differences. A similar computation was performed for purposes of presenting the trends of change

Table 7. Ratio¹ of change, organizational, operational variables, and socio-economic variables, 1954 through 1964 (1954 = 1).

Ratio of Change						
Year	Advisors	Specialists	Days of extension methods training	Days of subject-matter training	Farmer co-operatives members	Agricultural credit borrowers
	No. of	No. of	No. of	No. of	No. of	No. of
1954	1.00	1.00	1.00	1.00	1.00	1.00
1955	1.50	0.71	2.36	0.25	2.25	1.18
1956	1.40	0.71	0.50	2.25	3.05	0.86
1957	1.70	0.86	0.70	0.50	3.75	1.11
1958	2.10	1.14	3.85	----	5.65	1.90
1959	1.70	0.86	1.36	1.50	3.55	2.47
1960	1.70	0.57	0.00	1.75	6.30	2.03
1961	1.80	0.57	2.14	----	6.50	1.55
1962	4.90	1.71	3.93	2.00	6.45	1.25
1963	4.30	1.00	0.00	0.00	6.10	1.36
1964	4.10	1.14	0.43	8.25	7.50	1.20

1. Ratio of change is the number of times greater the number of organizational, operational, and socio-economic variables were for each year, 1955 through 1964, relative to the year 1954.

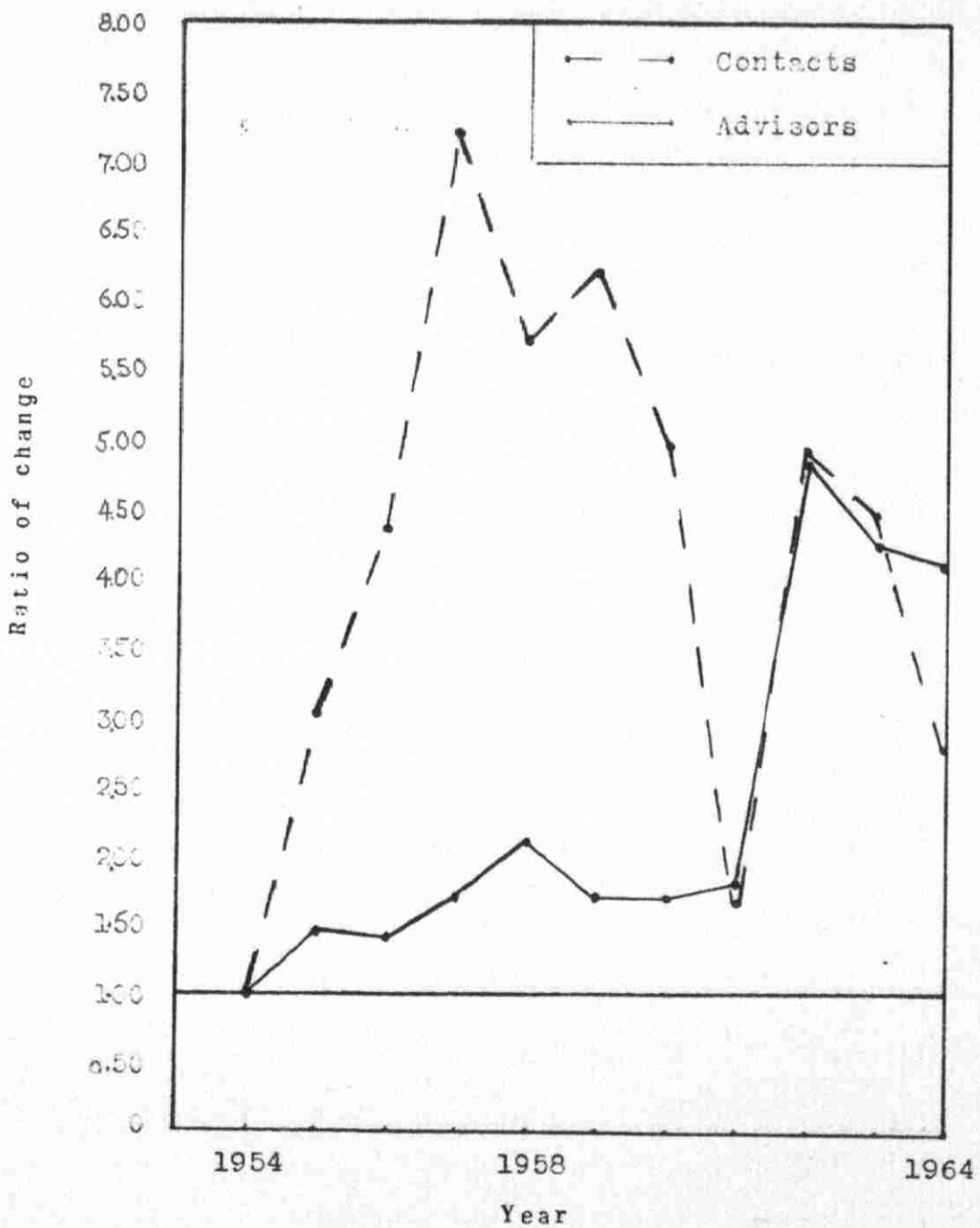


Figure 1. Ratio of change in numbers of advisors and total contacts, 1954 through 1964 (1954 = 1.00).

in total number of contacts between the JAED and the rural population for the period under study as shown in Table 8 and Figure 1. By the end of 1964, the number of advisors had increased to 4 times the base year level. Total contacts attained a sharp increase during the first 3 years and then fluctuated in a general downward manner for the rest of the period. In 1964, total contacts were almost 3 times more numerous than in 1954. From 1954 to 1961, trends of changes in contacts and in advisors differed considerably. Only in 1961-62 did the 2 variables showed a marked similarity of growth. However, at the end of the period, both variables revealed a similar downward trend. Since 1961, however, periods of growth and decline were markedly similar.

Changes in the number of times each method was used were computed as ratios of change and are reported in Table 8 and Figure 2.

Farm visits increased in 1964 to 6 times their 1954 level. During the study period, increases in number of farm visits were generally greater than those of advisors. However, the 2 variables showed similar patterns of growth and decline particularly during the last 3 years of the period.

Office calls increased gradually for the first 6 years before dropping sharply. In 1961, the trend in number of office calls reached to a level below that of

Table 8. Ratio of change¹ in number of times each extension method was used, 1954 through 1964 (1954 = 1)

Year	Extension methods					Total contacts
	Farm visits	Office calls	Method demonstrations	General meetings	Planning meetings	
1954	1	1	1	1	1	1
1955	3	1	2	5	2	3
1956	5	1	3	9	4	4
1957	6	2	6	14	1	7
1958	6	2	6	10	2	5
1959	4	3	4	11	2	6
1960	4	3	2	9	1	5
1961	2	1	2	4	-	2
1962	9	1	7	17	-	5
1963	8	1	5	15	-	5
1964	6	1	4	9	-	3

1. Ratio of change is the number of times greater the number of times each extension method was used for each year, 1955 through 1964, relative to the year 1954.

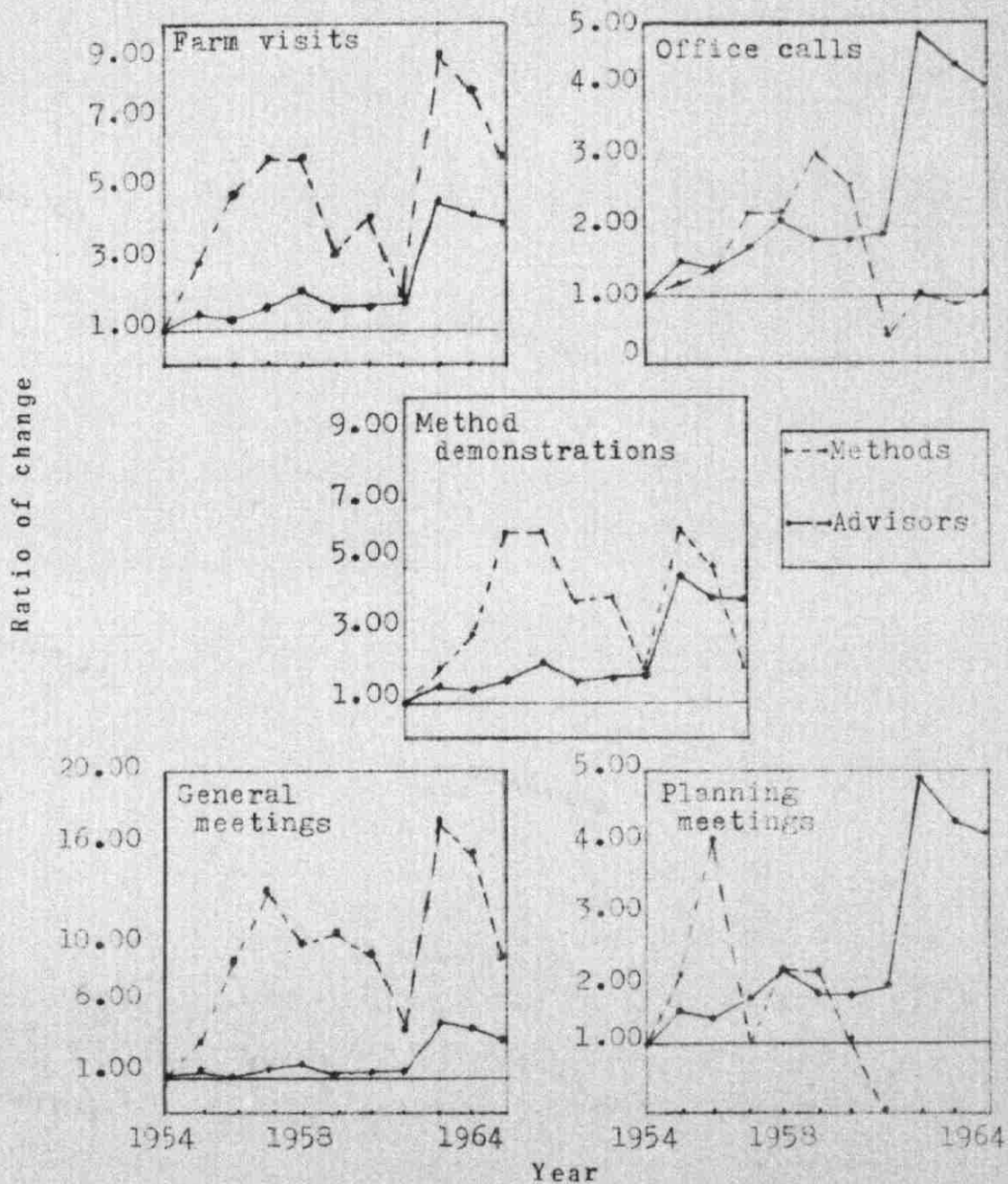


Figure 2. Ratio of change in numbers of advisors and in times extension methods were used, 1954 - 1964. (1954 = 1).

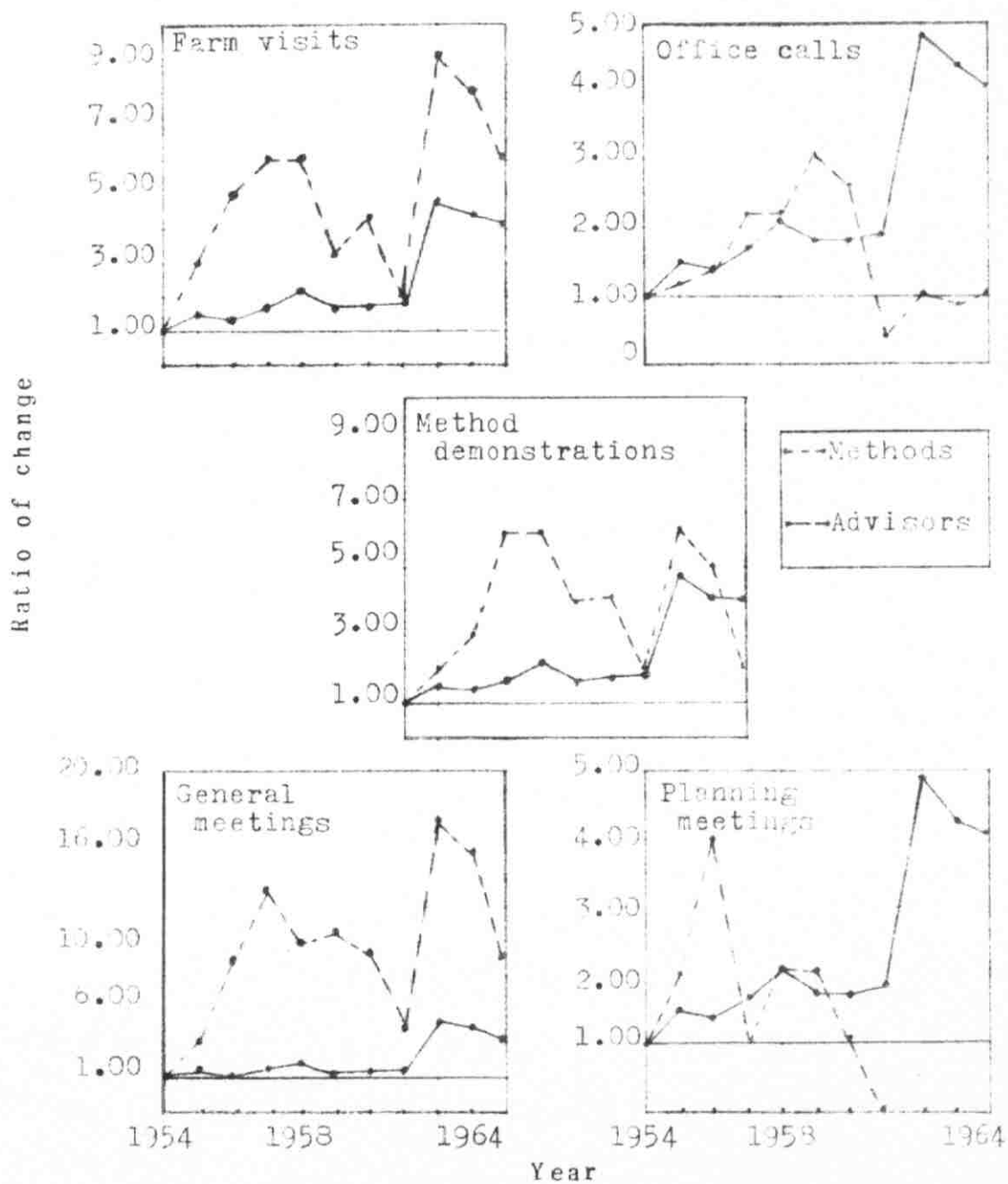


Figure 2. Ratio of change in numbers of advisors and in times extension methods were used, 1954 - 1964. (1954 = 1).

the index year where they remained for the rest of the period. For the same period, changes in the numbers of advisors increased sharply and were greater than changes in office calls.

Method demonstrations increased to 6 times the base year level during the first 4 years whereas, in the same period, advisors increased to 2 times only.

In 1958, method demonstrations declined sharply until 1961. They then increased sharply only to decline during the latter part of the period. Thus, trends of change in the use of methods, when presented with those of advisors, were similar for 1961 through 1964.

General meetings increased sharply through the first 3 years to almost 11 times greater than the base year. These were gradual reductions in 1960 and 1961 which preceded a sharp increase in 1962. 1963 and 1964 were years of downward trend. From 1961 through 1964, changes in general meetings and in advisors were of nearly the same order, though changes for general meetings were of greater magnitude than those for advisors.

Planning meetings increased to 3 times for the first 2 years while extension advisors rose only by 1.4 times for the same period. In 1957, planning meetings were reduced sharply to the level of the index year while the number of advisors continued to rise gradually. In 1959 and 1960, planning meetings dropped sharply to below the

level of the index year (such meetings ceased to exist in 1961) while the number of advisors continued to rise.

Hypothesis 2: If the total number of specialists employed by the JAED increased during the period 1954 through 1964, it was expected that a similar growth would occur in the number of total contacts between the JAED and the rural population and in the number of times each extension method was used.

Changes in the number of specialists employed by the JAED were computed as ratios of change and are shown in Table 6 and in Figures 3 and 4. Total number of specialists decreased to below the level of 1954 during the first 4 years, while for the same period, total contacts increased sharply by 7 times. In 1958, the number of specialists increased and total contacts decreased whereas in 1959 total contacts increased again to 6 times the 1954 level, while numbers of specialists dropped to below the index year level. From 1960 through 1964, total contacts dropped to 3 times the index year level, while total numbers of specialists increased slightly to 1.14 times the index year level.

Changes in the numbers of times each Extension method was used were computed as ratio of change and reported in Table 8. They are represented in graphic form in Figure 4.

Farm visits and number of specialists showed similar trends from 1961 to the end of the period, with

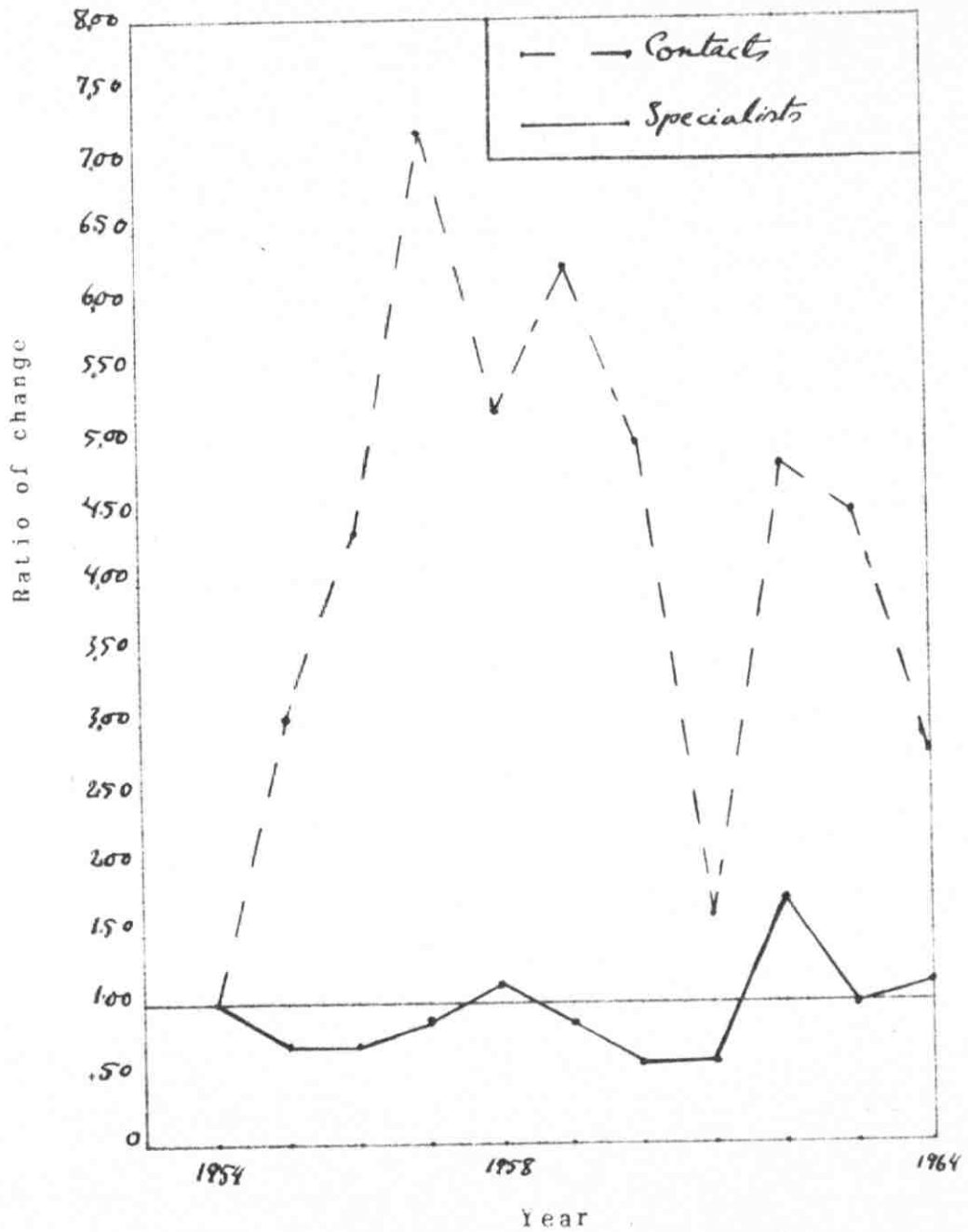


Figure 3. Ratio of change in number of specialists and total contacts, 1954 - 1964. (1954 = 1).

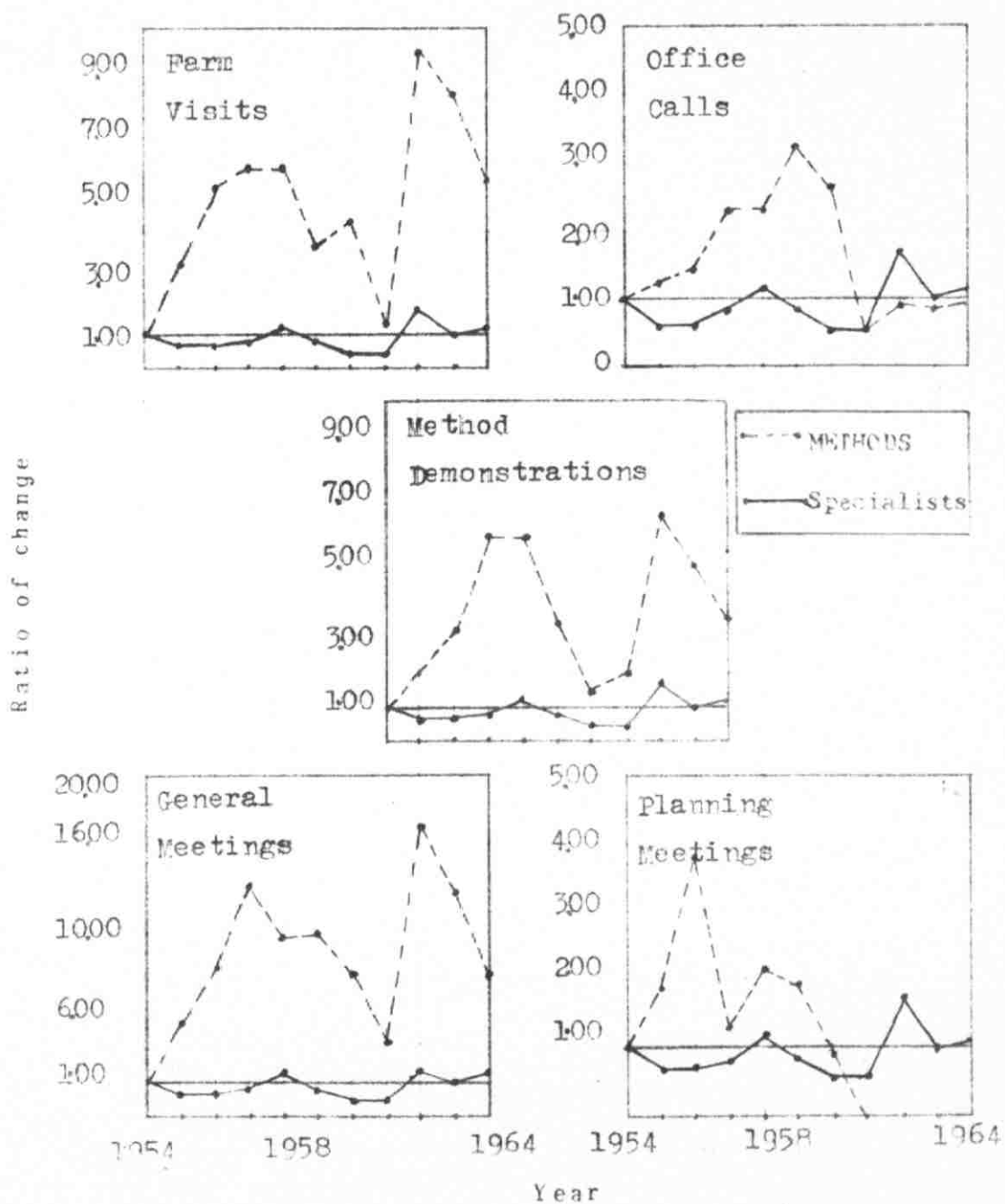


Figure 4. Ratio of change in numbers of specialists and in times extension methods were used, 1954 - 1964. (1954 = 1).

farm visits having the greater magnitude of change. Prior to 1961, both variables were much different in trends of change with farm visits having greater magnitude of change.

Office calls increased gradually for the first 6 years, while for the same period, numbers of specialists increased only to 1.14 times the index year's level. From 1960 through 1964, both variables showed similar trends of change, except for 1962 when increasing trends in specialists were greater than those of office calls.

Method demonstrations increased sharply during the first 6 years, while for the same period, numbers of specialists dropped to below the index year's level. Generally, from 1959 through 1964, both variables showed similar trends of change with method demonstrations having the greater magnitude of change. In 1964, the situation was reversed, yet method demonstrations were of greater magnitude of change.

General meetings during the first 4 years increased sharply, while numbers of specialists decreased to below the index year's level. From 1958 to the end of the period, general meetings were reduced gradually to 4 times the index year level while numbers of specialists increased in 1958 to 1.14 times above 1954 before reducing again to below the index year level. Both variables showed similar trends of change from 1959 through 1963. In 1964, numbers

of specialists increased to 1.14 greater than 1954. In all cases, changes in general meetings were of greater magnitude than those of specialists.

Planning meetings, for the first 2 years were of greater magnitude of change than those of specialist which dropped to below the index year level. From 1957 through 1961 (when planning meetings ceased to exist), both variables showed similar trends, with planning meetings having greater magnitude of change.

Hypothesis 3: If the total number of days devoted to training extension advisors about extension methods increased during the period 1954 through 1964, it was expected that a similar growth would occur in the number of total contacts and in the number of times each extension method was used.

Total number of days devoted to extension methods' training increased to 2 times the 1954 level in the first year of the period and then dropped sharply in 1956 to below the level of the index year. They then rose again in the following 2 years to 4 times more numerous than 1954. In 1959 and 1960, both number of days devoted to extension methods' training and total contacts showed a downward trend of change, but the latter were of greater magnitude of change as shown in Table 6 and Figure 5, whereas it is obvious that both variables for the total period of study showed no similarities in trends of change and that total

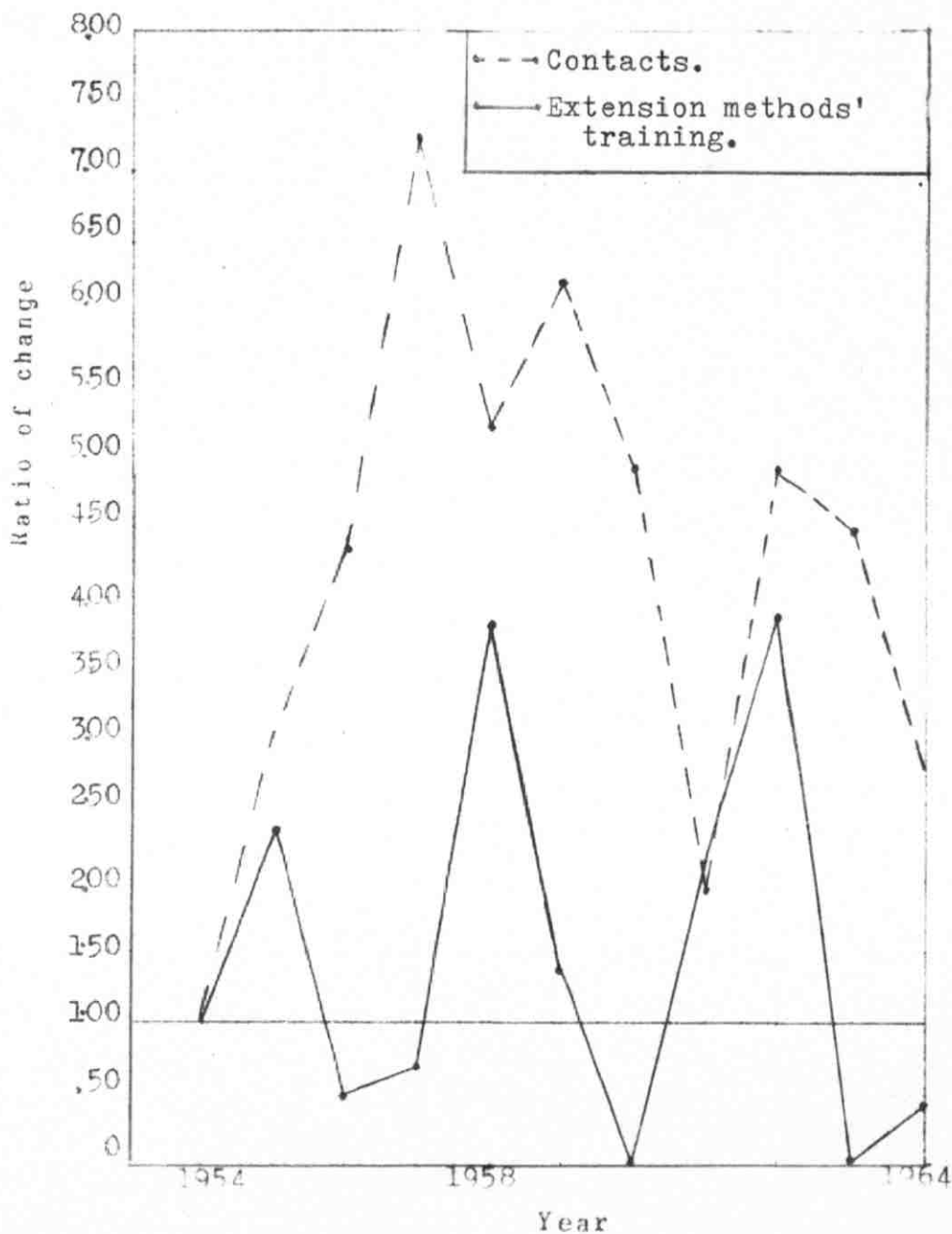


Figure 3. Ratio of change in number of days of extension methods' training and total contacts, 1954 - 1964. (1954 = 1).

contacts were, generally, of greater magnitude of change than the other variable.

Changes in the number of times each Extension method was used were computed as ratios of change and reported in Table 4 and represented in graphic form in Figure 6.

Farm visits increased gradually in the first 4 years to 6 times the level of 1954. For the same period, changes in the numbers of days of extension methods' training increased by 4 times. From 1958 to 1961 both variables dropped to almost 2 times more numerous than the base year. After 1960, both variables revealed a similar trend of change except that farm visits were of greater magnitude than extension methods training.

Office calls increased gradually for the first 6 years. Beginning with 1959, office calls suffered a sharp decrease to the extent that they returned to the level of the index year by 1964. Unlike office calls, changes in the trends of extension methods' training were of uneven pattern, dropping to below the level of the index year in 1956, 1957, 1960, 1963, and 1964. Generally, office calls were of lesser magnitude of change than that of extension training.

Method demonstrations and number of days of extension methods training showed similar trends of change except for 1956 and 1964, and with method demonstrations

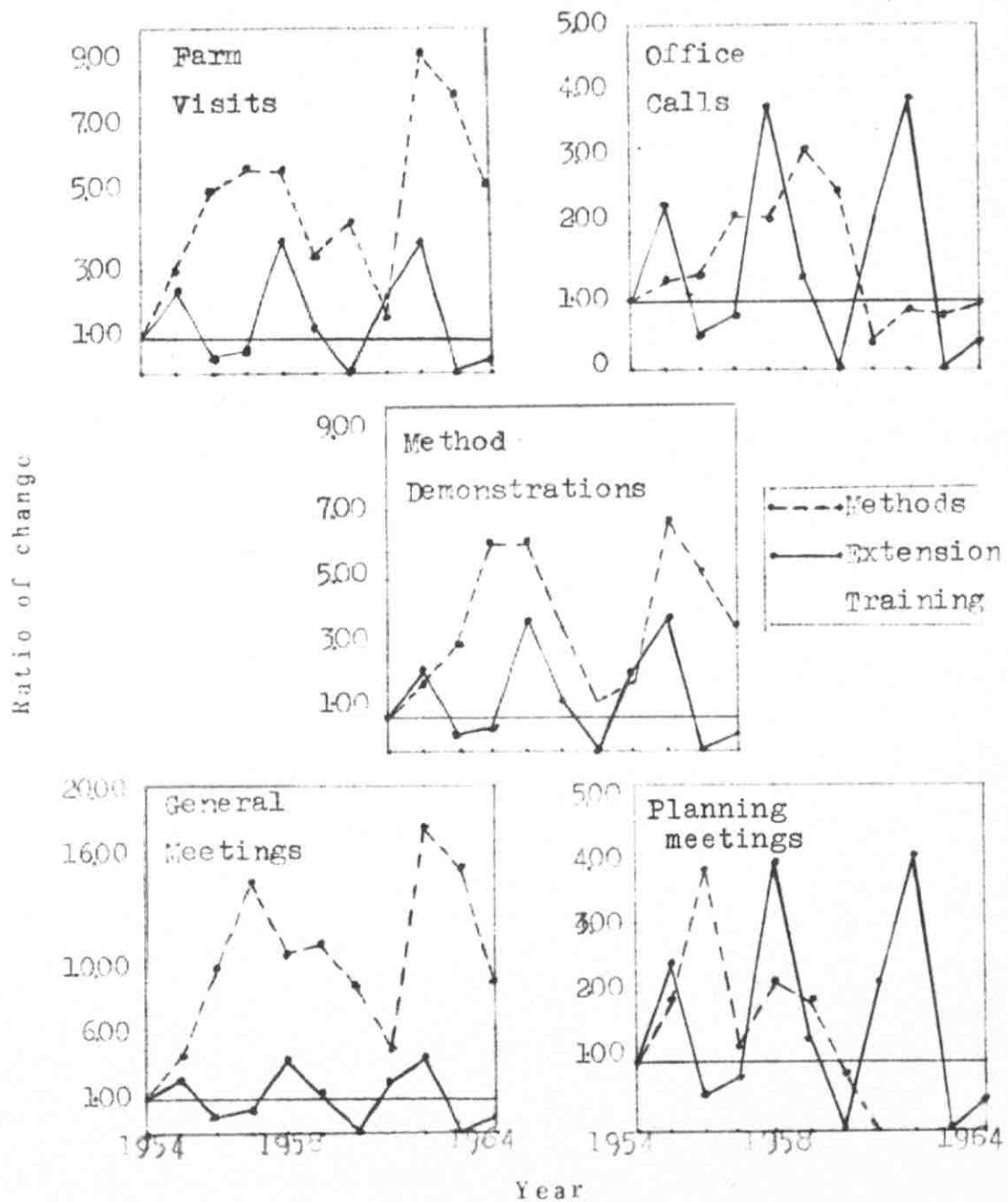


Figure 6. Ratio of change in number of days of extension methods' training and in times extension methods were used, 1954 - 1964. (1954 = 1).

having the greater magnitude of change.

General meetings increased sharply for the first 3 years, while for the same period of time, numbers of days of extension methods training were reduced to below the index year level. From 1962 through 1963, both variables showed similar trends of change with general meetings having the greater magnitude of change.

Planning meetings and number of days of extension methods' training showed similar trends of change and magnitude for the first year of the period, Later on and until 1960, where planning meetings ceased to exist, both variables showed different patterns of change and magnitude.

Hypothesis 4: If the total number of days devoted to training extension advisors about technical subject-matter increased from 1954 through 1964, it was expected that a similar growth would occur in the total number of contacts made between the JAED and the rural population and in the number of times each method was used.

Changes in the numbers of days devoted to subject-matter training were computed as ratios of change and reported in Table 6 and Figure 7. Numbers of days devoted to subject-matter training dropped in the first year of 1955 to below the level of 1954 while for the same period, total contacts increased to 3 times the index year level and which rose to their maximum in 1957 of 7 times the

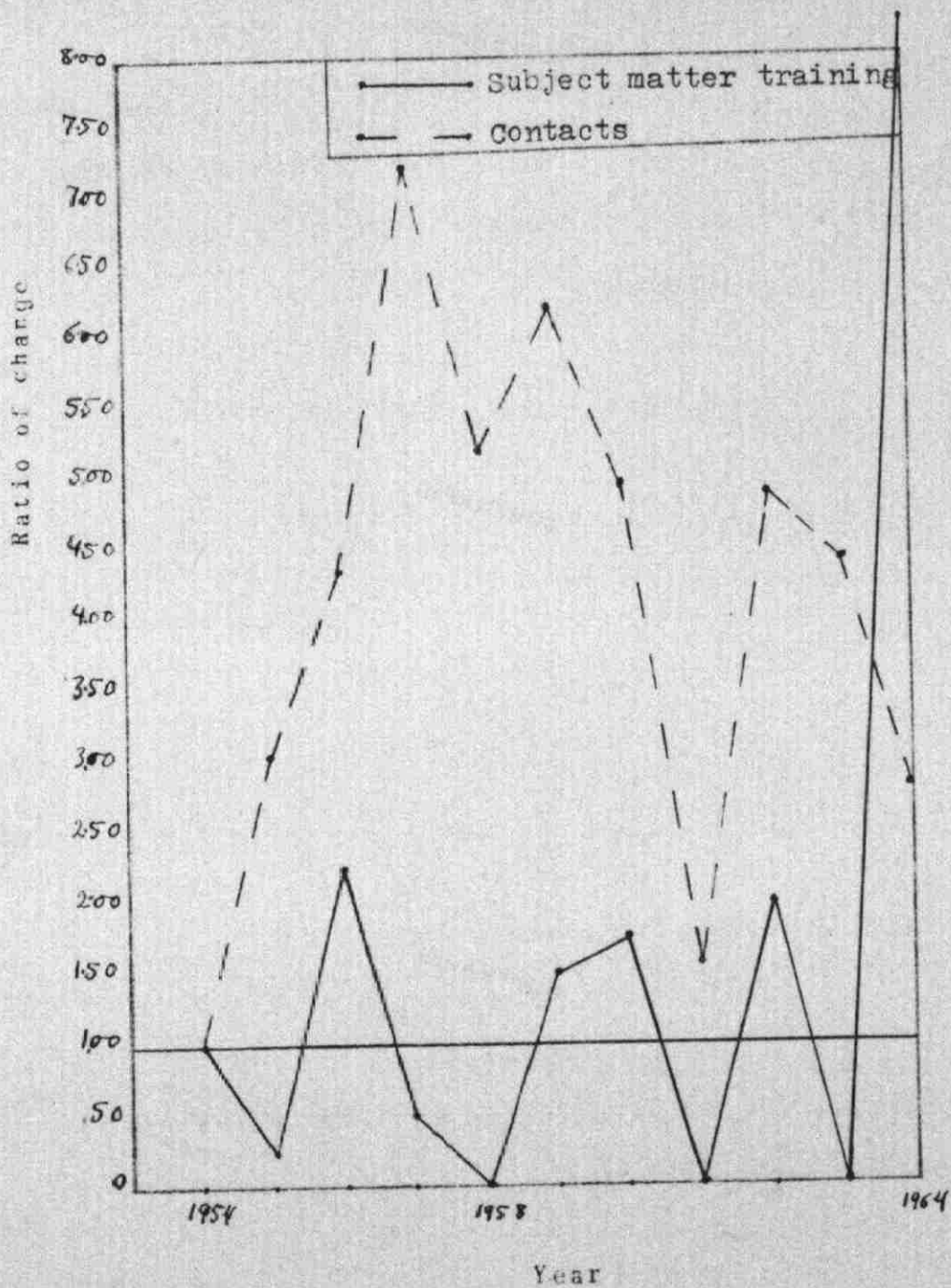


Figure 7. Ratio of change in number of days of subject-matter training and total contacts, 1954 - 1964. (1954 = 1).

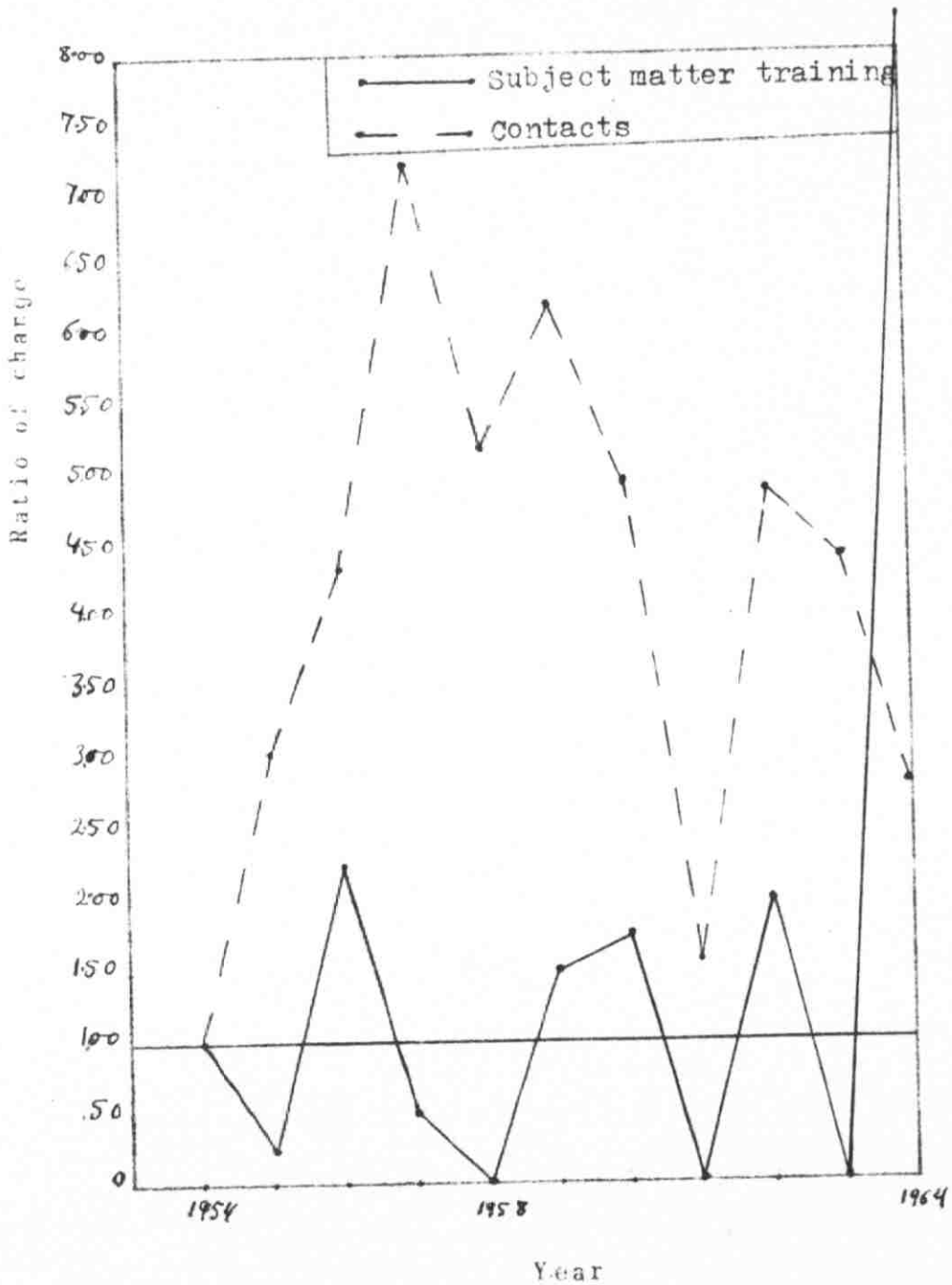


Figure 7. Ratio of change in number of days of subject-matter training and total contacts, 1954 - 1964. (1954 = 1).

index year level, while at that time, numbers of days devoted to subject-matter training dropped to below the index year level. From 1958 until 1959, both variables showed similar trends of change with total contacts having greater magnitude of change, and the same for the period 1961 through 1963, but in 1964 they showed different trends and number of days of subject-matter training were of greater magnitude of change than total contacts.

Changes in the number of times each extension method was used were computed as ratios of change and reported in Table 8 and represented in graphic form in Figure 8.

Farm visits increased sharply by 6 times for the first 4 years before levelling off. For the same period, subject-matter training rose to the level of 2 times more numerous than 1954 before dropping down to the zero level. From 1959 through 1963, both variables showed similar trends with farm visits having the greater magnitude of change. However, in the last year of the period, the situation was reversed.

Office calls increased gradually from 1954 to 1959, while for the same period, subject-matter training showed lesser magnitude of change and of an uneven trend. From 1958 through 1961, both variables showed nearly similar trends with office calls having greater magnitude of change. From 1961 through 1964, office calls dropped

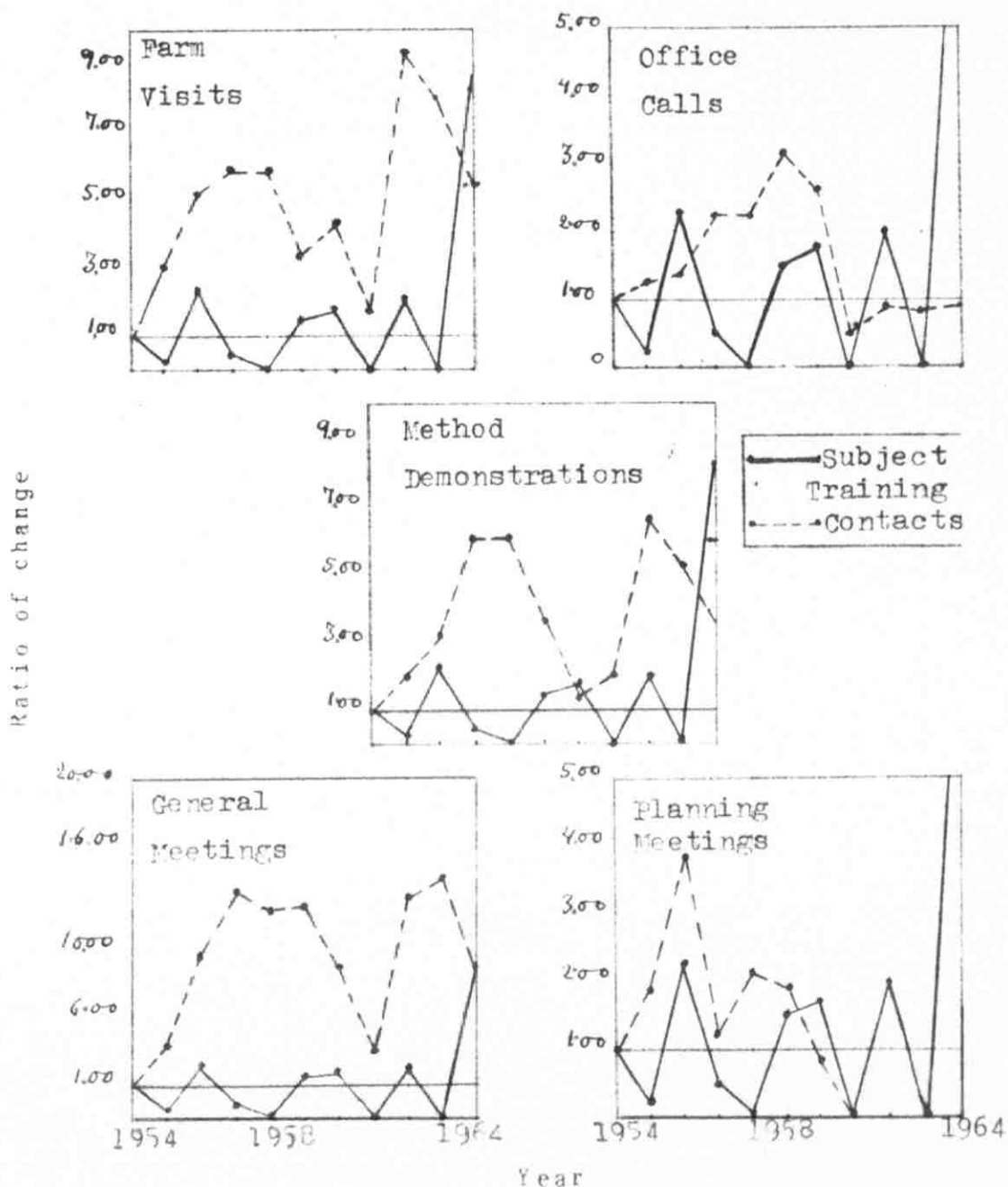


Figure 8. Ratio of change in number of days of subject-matter training and in times extension methods were used, 1954 - 1964. (1954 = 1).

to below the level of 1954. During the same period, subject-matter training rose to 2 times greater than 1954 before decreasing to the zero level followed by a sharp increasing trend. Subject-matter training revealed changes of greater fluctuation than those of office calls.

Method demonstrations in the first 4 years increased sharply to 6 times greater than 1954, while for the same period, number of subject-matter training days decreased to below the index year level. In 1958 through 1960, method demonstrations decreased sharply to almost the level of the index year, while the other variable increased through the same period to 2 times the 1954 level before falling back to the zero level. In 1961, both variables showed similar trends of change with method demonstrations having greater magnitude of change until 1963 when they started to decrease and days of subject-matter training were rising sharply.

General meetings and days of subject-matter training changed similarly for the period 1957 through 1962. For the first 4 years, general meetings increased sharply to 14 times more than 1954, while days of subject-matter training increased only to 2 times the 1954 level. In 1962 through 1964, both variables showed different trends of change with general meetings having the greater magnitude of change than those of days of subject-matter training.

Planning meetings increased sharply by almost

4 times greater than the index year for the first 2 years. Both variables; i.e., planning meetings and subject-matter training days, showed similar trends for the period 1955 to 1957. There were no similarities in the later years of the period understudy. During the period of 1954 through 1959, planning meetings showed greater magnitude of change than subject-matter training, except for 1960 when the situation was reversed.

Hypothesis 5: If the total number of farmer cooperative members increased during the period 1954 through 1964, it was expected that there would be a similar growth in the number of contacts between the JAED and the rural population, and in the number of times each Extension method was used.

Changes in the number of farmer cooperatives'
members during the period of study are reported in Table 6 and in Figure 9. The total number of farmer cooperatives' members increased sharply to 5 times for the first 4 years of the period understudy, while total contacts during the same period, although by 1958 increased in the same manner as number of members of farmer cooperatives, showed greater magnitude of change. From 1957 through 1964 both variables showed different trends and magnitudes of change. Only in 1955 through 1957, did the two variables showed similar trends of change and magnitude.

Changes in the number of times each extension

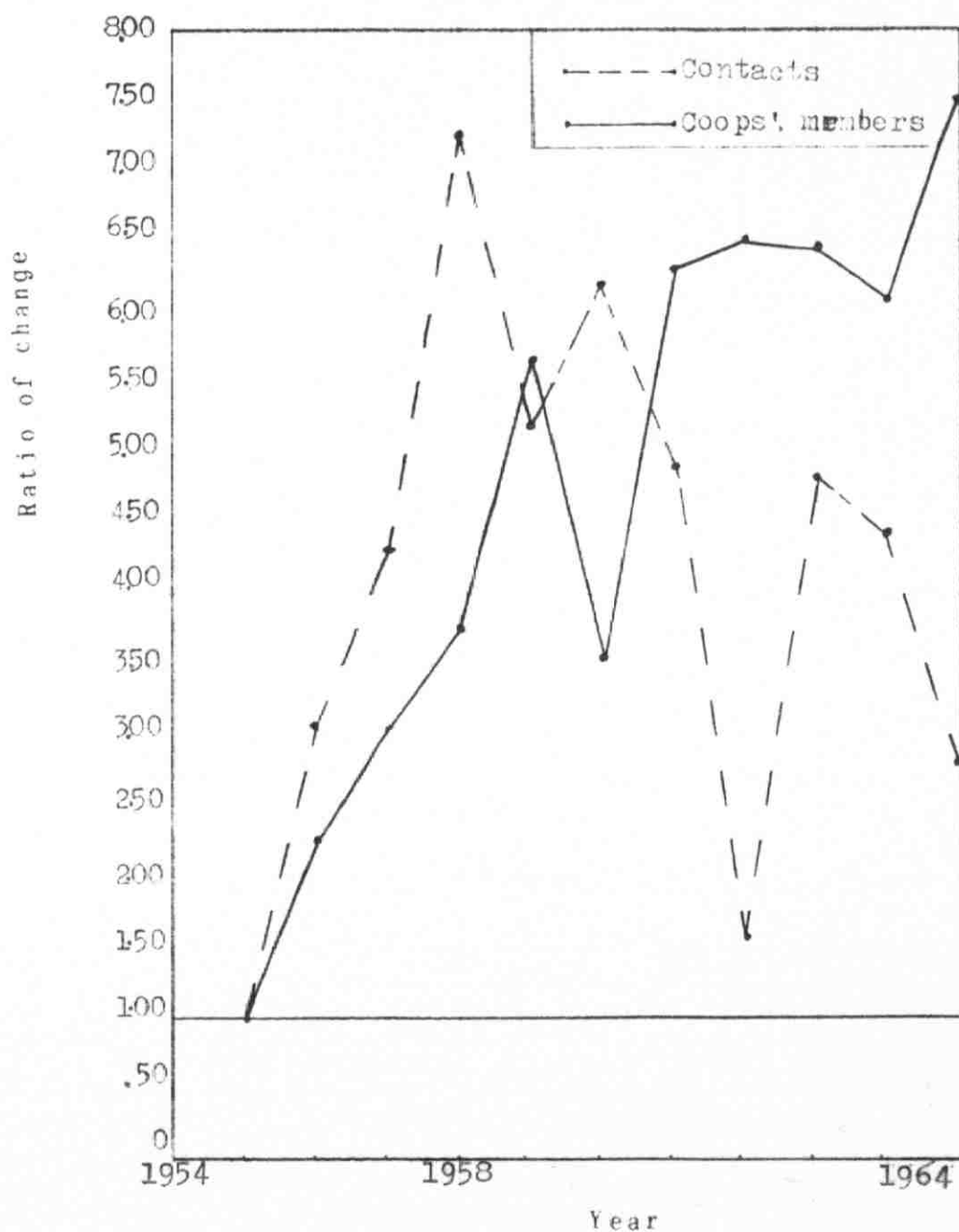


Figure 9. Ratio of change in number of farmer cooperatives' members and total contacts, 1954 - 1964. (1954 = 1).

method was used by the JAED were computed as ratios of change in Table 8 and represented in graphic form in Figure 10.

Farm visits and number of farmer cooperatives' members increased almost by 6 times more than 1954 in the first 4 years. By 1959, both variables dropped to about 3 times more numerous than 1954. In 1960, both variables resumed increasing. Farm visits increased to 4 times greater than 1954. From 1961 to 1964, both variables showed different trends of change. However, by 1964 farmer cooperatives' members were 8 times more numerous than 1954, while farm visits were only 5 times above the level of 1954.

Office calls and number of farmer cooperatives' members showed similar trends of change for the first 4 years. However, number of farmer cooperatives' members showed greater magnitude of change than those of office calls. By 1959, farmer cooperatives' members dropped to 4 times more numerous than 1954, while for that same year, office calls increased to 3 times greater than 1954. From 1960 to 1964, number of farmer cooperatives' members resumed increasing to 8 times above that of 1954 while office calls continued to drop until 1964 when they nearly reached the level of 1954.

Method demonstrations and number of farmer cooperatives' members increased by 6 times more numerous

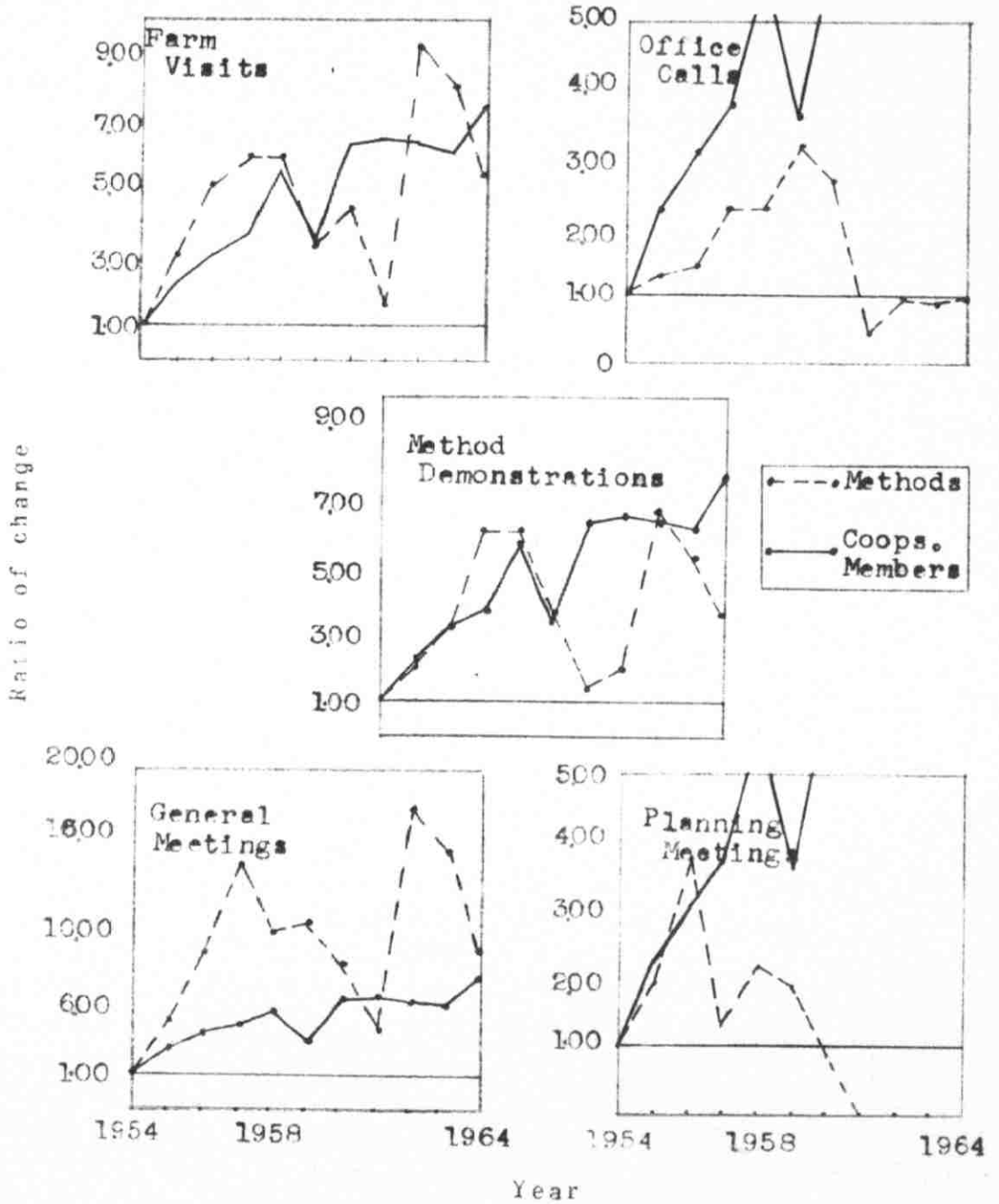


Figure 10. Ratio of change in number of farmer cooperatives' members and in times extension methods were used, 1954 - 1964. (1954 = 1).

than 1954 for the first 5 years. In 1959, both variables dropped to 4 times greater than 1954. From 1960 to 1964 members of farmer cooperatives increased continuously to 8 times above the 1954 level, while at the end of the same period of time, method demonstrations were only 4 times more numerous than 1954.

General meetings and number of farmer cooperatives' members showed, generally, similar trends of change for the first 3 years, although general meetings increased by 14 times more than 1954 while number of farmer cooperatives' members increased by only 4 times more numerous than 1954. Except for 1959, where number of farmer cooperatives' members dropped to 4 times greater than 1954, they continued to increase gradually until 1964 when they were 8 times greater than 1954. General meetings, except for 1961, when they dropped to 4 times more numerous than 1954, showed greater magnitude of change than the other variable and in 1964 they were 9 times greater than 1954.

Planning meetings and number of farmer cooperatives' members showed similar trends for the first 2 years. In 1956, planning meetings were 4 times greater than 1954, while number of farmer cooperatives' members were 3 times more numerous than 1954. From 1957 to 1960, when planning meetings ceased to exist, number of farmer cooperatives' members increased to 6 times greater than 1954,

while planning meetings dropped continuously to about the level of 1954.

Hypothesis 6: If the total number of agricultural credit borrowers increased during the period 1954 through 1964, it was expected that there would be a similar growth in the number of total contacts made between the JAED and the rural population and in the number of times each extension method was used.

Changes in the total number of agricultural credit borrowers were computed as ratios of change that are recorded in Table 6 and represented in graphic form in Figure 11. Agricultural credit borrowers increased by 1.11 times greater than 1954 for the first 3 years, whereby total contacts increased by 7 times more than 1954 over the same period of time. From 1958 to 1961, both variables showed similar trends with total contacts having greater magnitude of change. In 1961 both variables were equal in terms of magnitude of change and later changes in the number of agricultural credit users revealed a drop while total contacts resumed a sharp increase. In 1964, the total number of agricultural credit users was only 1.20 times more numerous than 1954 while total contacts were 3.00 times greater than 1954.

Changes in the number of times each extension method was used by the JAED were computed as ratios of change in Table 8 and represented in graphic form in Figure 12.

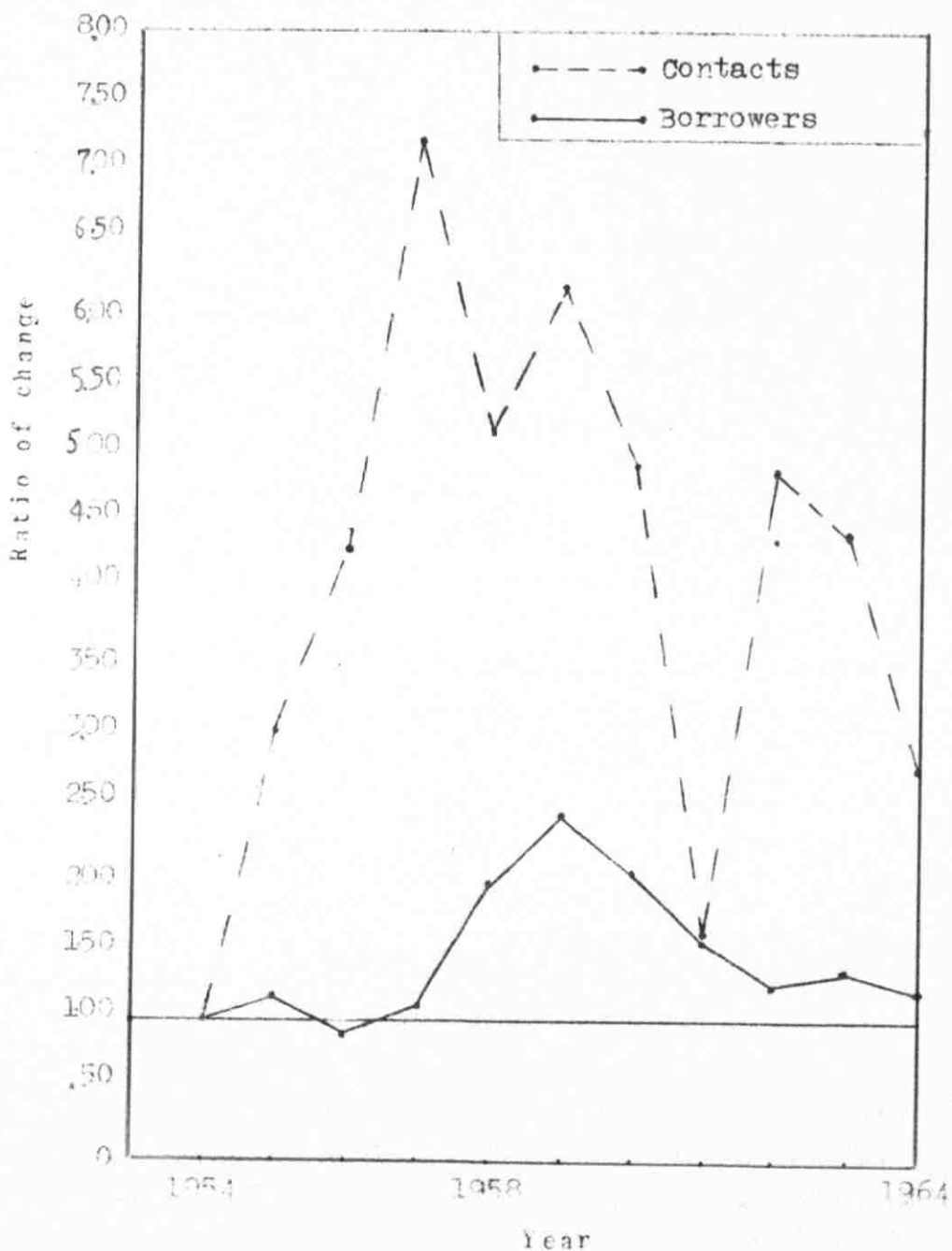


Figure 11. Ratio of change in number of agricultural credit borrowers and total contacts, 1954 - 1964. (1954 = 1).

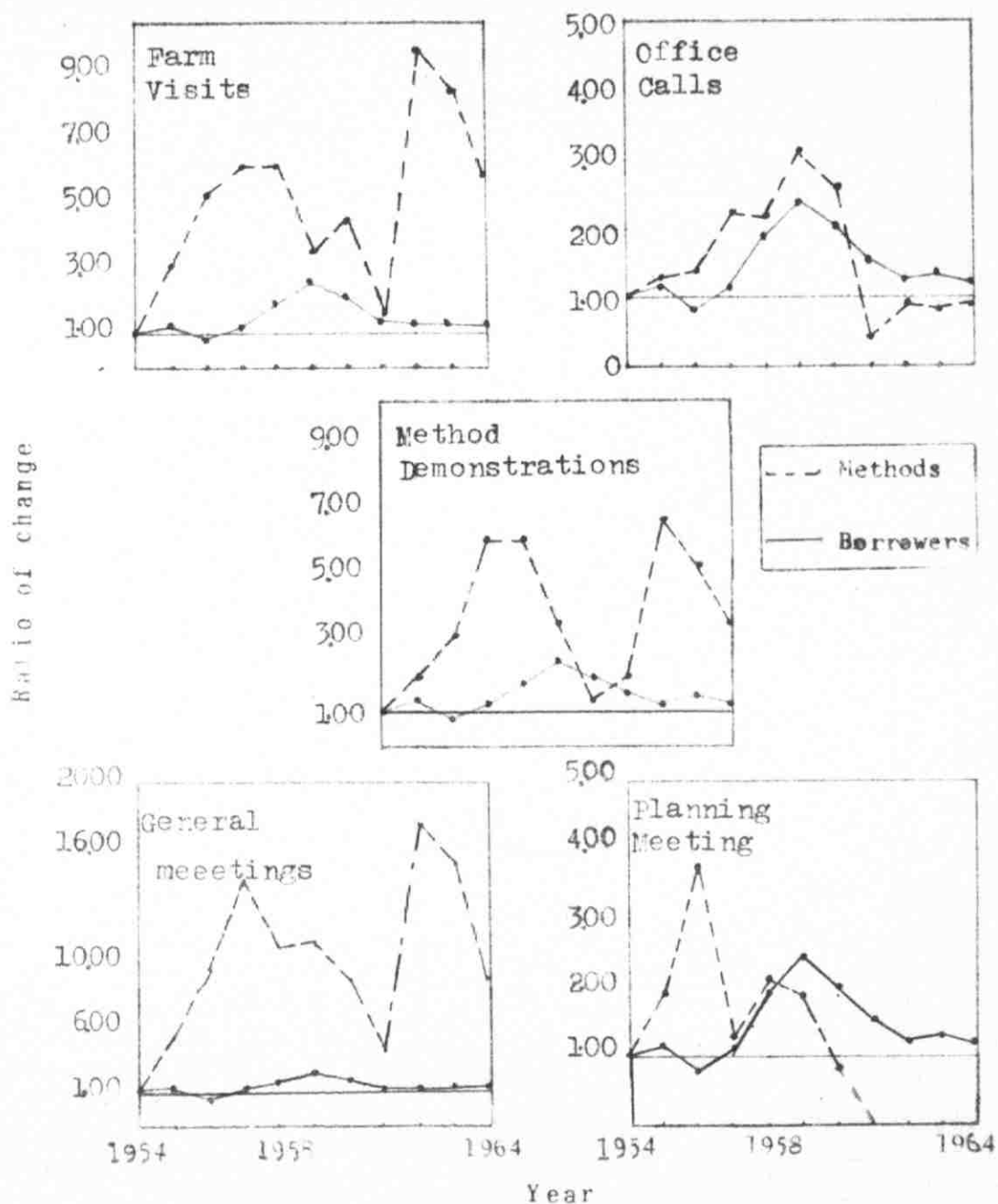


Figure 12. Ratio of change in number of agricultural credit borrowers and in times extension methods were used, 1954 - 1964. (1954 = 1).

Farm visits increased sharply to 6 times for the first 4 years before levelling off. For the same period the number of agricultural credit borrowers increased slightly, then dropped to below the level of 1954 and later increased. In 1958, the number of agricultural credit borrowers increased to 2 times greater than 1954. From 1958 to 1959 both variables showed different trends of change. Farm visits dropped to the level of 3 times than that of 1954, while agricultural credit borrowers increased by 2.47 times more than the base year. For the rest of the period of study, agricultural credit borrowers continued to drop while farm visits showed uneven trends of change but of greater magnitude of change than those in numbers of agricultural credit borrowers.

Office calls increased gradually to 3 times greater than 1954 for the first 5 years. For the same period of time, the number of agricultural credit borrowers increased to 2.47 times more numerous than 1954. From 1959 to 1961, both variables continued to drop, but office calls showed greater magnitude of change than that for agricultural credit borrowers. In 1961, the number of borrowers showed greater magnitude of change than office calls and remained so for the rest of the period.

Method demonstrations increased sharply to 6 times more numerous than the index year level for the first 3 years while agricultural credit borrowers, for the same

period did not achieve any growth in number. Method demonstrations after a period of 1 year of levelling off, dropped sharply in 1960, to the level of the index year, while agricultural credit borrowers continued to rise in number until 1960 when they dropped to 2 times the index year level. Generally speaking, both variables showed different trends of change and magnitude, except in 1955 when they showed similar trends.

General meetings increased sharply to 14 times the index year level for the first 4 years, while for the same period, number of agricultural credit borrowers increased to only 1.11 times the level of the index year. General meetings in 1958 through 1961 dropped gradually while number of agricultural credit borrowers increased to 2.47 times the level of the index year. In 1964, general meetings increased to 8.6 times the level of the index year, while the number of agricultural credit borrowers dropped to 1.20 times the level of the index year.

Planning meetings: The number of agricultural credit borrowers for the first 2 years did not increase but rather dropped to below the index year level. In 1958, planning meetings dropped to 2 times more than 1954, while number of agricultural credit borrowers increased to 2 times more than 1954. From 1958 to 1960 (when planning meetings ceased to exist), both variables showed similar trends of change, yet planning meetings in 1960 dropped to below the

index year level while number of agricultural credit borrowers increased to 2 times more than 1954.

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine selected changes within and external to the JAED during the period 1954 through 1964. To carry out the study, 6 hypotheses were formulated and tested to determine the possible relationship between on the one hand, organizational and operational aspects of the JAED, and socio-economic conditions of rural Jordan, and on the other hand, the actual performance of the JAED as represented by total contacts made between the JAED and the rural population and the number of times each extension method was used.

To achieve this purpose, data were recorded from official documents of the JAED and other governmental agencies of Jordan. These data included numbers of extension advisors and specialists, days devoted to extension methods training, days devoted to subject-matter training, kinds of extension methods used by the JAED, including number of times each extension method was used, the number of contacts made between the JAED and the rural population of Jordan, number of members of farmers' cooperatives associations, and number of agricultural credit borrowers.

Bases for analyses of data were 6 hypotheses which

suggested that if increases in advisors, specialists, training cooperatives* members, and agricultural credit borrowers were observed during the years 1954 through 1964, it was expected that a similar growth would occur in the number of contacts between the JAED and the rural population of Jordan, and in the number of times different extension methods were used. Findings about these expectations are summarized as follows.

Changes in the variables under study during the period 1954 through 1964, were computed as ratios of change with 1954 as the index year. Data were recorded in Tables 5 through 8 and in Figures 1 through 12.

Total contacts between the JAED and the rural population increased in 1957 to 7 times the 1954 level, then they fluctuated in a general downward trend of change until 1964 when they were 3 times the 1954 level.

During the first 8 years of the period under study, changes in the numbers of advisors did not exceed 2 times the index year's level. In 1963, numbers of advisors increased to and in parallel manner as total contacts. In 1964, they dropped to 4 times the 1954 level. The number of times each extension method was used, was greater than changes in the numbers of advisors. Nevertheless, there were partial periods of time when the 2 variables showed similar patterns of change.

Changes in the number of days devoted to training

extension advisors about extension methods fluctuated unevenly during the period of study and were also of lesser magnitude of change than total contacts. As for the number of times each extension method was used, it was found that these changes were also of fluctuating nature and of lesser magnitude of change than those of extension methods training. Only in case of method demonstrations were both variables of nearly similar trends.

Changes in the number of days devoted to training extension advisors about technical subject-matter were found to have fluctuated unevenly and were of lesser magnitude than total contacts through the period of study. As regards the number of times each extension method was used, it was found that they were of greater magnitude of change than those of subject-matter training and that no similarities between the trends of both variables were identifiable.

Changes in the number of specialists employed by the JAED during the period of study were found to have fluctuated below and above the level of 1954. However, they were found to be of much lesser magnitude of change than those of total contacts. It was found also that there were no similarities between the trends in the use of extension methods and numbers of specialists and that the use of extension methods was of greater magnitude of change than that for numbers of specialists.

Changes in the number of farmer cooperative members during the first 3 years of the period understudy were rising parallel to those of total contacts. For the rest of the period, both variables were of opposite trends with total contacts reducing gradually while number of farmer cooperative members continued to increase. As regards the number of times each extension method was used, it was found that there were similarities in trends between both variables but for partial periods of times, and that the number of times an extension method was used were of greater magnitude of change than number of farmer cooperative members for general meetings only. and,

Changes in the number of agricultural credit borrowers during the period of study were found to be of much lesser magnitude of change than total contacts. In addition, there were marked differences in their trends of change. There were no similarities in trends between use of extension methods and numbers of credit borrowers for the period understudy as a whole. However, there were some similarities for partial periods of time. Changes in the number of agricultural credit borrowers were, for the most part, of lesser magnitude of change than that of Extension methods.

Conclusions

The following conclusions were drawn as a result of the tabulation and analyses of data:

1. There were no observable similarities in trends between variables for the total period, 1954 through 1964. Thus, the data did not confirm the hypothesized expectations for similar trends to have occurred throughout the period under study,
2. Similarities in trends of change did occur but for partial periods of time. For example, like patterns of change were observed for:
 - a. total contacts and numbers of advisors for the first and the last 3 years of the period,
 - b. farm visits and numbers of advisors, method demonstrations and advisors for the last 3 years, office calls and advisors for the first 4 years,
 - c. number of days of extension methods training and method demonstrations for the period 1957 through 1963, and number of specialists,
 - d. number of days of subject-matter training and total contacts for the period 1960 through 1963, and farm visits and days of subject-matter training for the period 1959 through 1963,
 - e. number of members of farmer cooperatives associations and total contacts for the first

3 years,

f. number of farm credit borrowers and office calls for the period 1957 through 1961, and

g. number of days of extension methods training and total contacts for the period 1960 through 1963. These findings and the percentage of

acceptance for each hypothesis are summarized in Table 9.

Table 9. Percentage of acceptance for hypotheses 1 through 6 and times extension methods were used.

Percentage of acceptance ¹						
Hypothesis	Total contacts	Farm visits	Office calls	Method demon- stration	General meetings	Planning meetings
1	45	55	45	55	27	27
2	36	27	45	55	45	27
3	45	45	45	64	45	36
4	55	45	36	27	45	18
5	36	45	36	45	36	36
6	55	45	45	36	45	27

$$1. \text{ Percentage of acceptance} = \frac{\text{No. of years hypothesis was accepted}}{\text{No. of years of total period of study}} \times 100$$

Limitations to the study: Since the researcher experienced, as a member of the JAED, many of the changes recorded herein, it appears relevant and appropriate that he provide some interpretations that may have bearing on the foregoing conclusions. For example, the following are general observations before proceeding to discuss each finding alone.

For the last four years of the period understudy, more similarities were observed between variables understudy, particularly between organizational changes and total contacts. Thus, the period 1961 through 1964 revealed trends of change more nearly with those expected than did the previous period. The reason for this occurrence may be that in 1961 all extension advisors having no agricultural training background were dismissed and new advisors with the desired qualifications were employed. Another, is that the JAED became an integral part of the Ministry of Agriculture in 1961 and thus acquired more institutional status. Its employees acquired more security by being on tenure which may have had a positive effect on farmer contacts.

The year 1961 revealed a sharp drop in the number of total contacts. This extensive downward trend may have been due to the engagement of extension advisors in preparations for the agricultural exhibit which was held in that year and to their work in the campaign against

locusts. Another, is that most of the advisors working in that year were newly appointed and inexperienced. The time required to build rapport with the farmers and to acquire their confidence may have limited the number of contacts with farmers.

As noted above, the hypotheses showing the greatest rate of acceptance involved subject-matter training days in relation to total contacts, and number of farm credit borrowers in relation to total contacts. The former can be explained by that the extension advisors were more readily able to extend to the farmers the amount of information learned at training sessions, than to utilize improved extension methods with the same information and which also indicate the higher degree of the farmers' receptivity for new information.

The higher degree of the positive tendency of the last hypothesis, namely, that of number of agricultural credit borrowers in relation to total contacts, can be explained by the closer cooperation between the agricultural credit supervisors and Extension supervisors who used to and are still cooperating in the planning and supervising of agricultural projects financed by the Agricultural Credit Corporation. This cooperation is later followed up by the extension advisors who keep and increase their contacts with the benefactor of the credit. Moreover, the cooperation between Extension and agricultural credit

supervisors is required by law, since each agricultural credit planning committee is composed of a representative of the JAED, and a representative of the Lands Surveying Department.

That kind of cooperation and coordination which existed between the JAED and the agricultural credit did not exist between the JAED and the Cooperatives' Union, because primarily such kind of coordination is not required by law, and since the Cooperatives' Union is a semi-autonomous organization, it is assumed that the personnel of the Cooperatives' Union would not have that sense of identification with the JAED as the Agricultural Credit Corporation would have with the JAED who both of them are enlisted in the same discipline; namely, agriculture.

The researchers' experience with the JAED suggests that subject-matter specialists were not in as close relationship with the extension advisors as with the top management and other agencies. Otherwise, more contacts would have been made with the farmers as explained in Chapter III. The earlier organizational structure of the JAED involved specialists (1) performing duties other than original extension work duties and (2) serving in other agencies of the government, e.g., Central Water Authority, Forestry Department, Veterinary Department, and Research Department. Such engagements limited the time and effort devoted by the specialists to field level advisors and

thus may have contributed to the failure of the second hypothesis.

Therefore, we can conclude that what caused the failure of the study's hypotheses are the following:

1. Lack of specificity of variables understudy,
2. Interaction between variables involved,
3. Shortage of time available to the conduct of the study,
4. Instability of the JAED as a whole, and
5. Climatic fluctuations.

Recommendations

A major question which may be posed about a research project such as has been reported in this thesis is: "of what importance is it or what directions does it suggest for future effort on the same or related efforts or problems?". Thus, in this section, the researcher has attempted to draw upon his experience and expertise in the formulation of recommendations to those who may wish to apply the findings and conclusions of this study to solving practical organizational and operational problems in the JAED or to a further empirical evaluation of the same variables.

Before reporting the recommendations, however, it is to be recognized that certain limitations existed which were beyond the control of the research design. For

example, the use of official reports as the only readily available source of information for the period understudy, were, nevertheless, sources of possible error. That is, the bases upon which reports were written may have changed over an eleven years period to the extent that statistics reported for one or more years at the beginning of the period may have had a quite different connotation than those reported for the same variable in later years. Also, as was noted in Chapter I, the limitations of time and other resources for the conduct of this study imposed certain restrictions on its scope and nature. Chief among these were changes in rates of adoption of recommended practices by farm people in Jordan. Though it is reasonable to expect that changes in numbers of contacts are related to the adoption of practices, it is most reasonable to conclude that reduction in numbers of contacts will, in all cases, mean reduction in practices adopted. Fewer contacts, with greater depth of educational programs, could, in some instances, be expected to have an opposite effect.

With above remarks, and with the findings and conclusions of this study as a basis, the following recommendations were formulated:

Policy recommendations:

1. Modifying the reporting system of the JAED so as to help furnish data on mass media extension methods, telephone calls, and contacts through

- other means than extension advisory ones.
2. That organizational and functional changes within the JAED should be kept to a minimum so as to help stabilize working conditions and allow the opportunity for any future evaluation study.
 3. That the JAED's subject-matter specialists should be relieved of any administrative or functional duties other than their original "extension" duties so to permit them to devote their full time to the help of field level advisors, moreover, the subject-matter specialists of the JAED should be increased so as to help decentralize their services to the "area" level at least.
 4. More coordination, between the JAED and the Agricultural Credit Corporation and the Cooperatives' Union, is required; it is also recommended that the required coordination between the JAED and the Cooperatives' Union should be implemented by law.

Areas of further research:

1. It is recommended that the present study should be performed with due consideration to the same variables but with greater specificity, e.g., making a distinction between contacts

- made through extension methods and those made through regulatory measures, making distinction between the number of advisors in administrative positions and those in only advisory positions, assessing the transportation facilities provided to the field level advisors, and assessing the size of the JAED's budget along the period understudy.
2. Conducting the present study, but taking into consideration the interaction between variables understudy and its effect on total contacts, number of times each extension method was used, and rate of adoption by the Jordanian farmers.
 3. Studying the effects of climatic fluctuations; namely, amount of annual rainfall and drought periods on the extent of JAED's contacts and rate of adoption by the farmers.
 4. The extension methods' training program of the JAED should be reviewed and evaluated so as to find out the reasons for the negative relationship between the total contacts and number of days devoted to training advisors about extension teaching methods.
 5. Taking into consideration all the foregoing

areas of further research and testing their effects on total contacts and rate of adoption.

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APPENDICES

APPENDIX A

Agricultural Extension Work

Agricultural extension work is defined by Kelsey and Hearn (1955, p.1) as a process by which adults and youth learn by doing in an out-of-school system of education. Its fundamental objective is the development of people. Extension is also defined by Penders (1956, p.17) as "helping people to help themselves". Extension work in agriculture and home economics is defined by Wilson and Gallup, (1955, p.1) as "assisting people engaged in farming and home making to utilize more fully their own resources, and those available to them, in solving current problems and in meeting changing economic and social conditions".

Approaches to doing extension work: Extension as applied in different countries, is described as utilizing one of the following approaches to carrying out its programs:

1. Educational approach; where Extension is an independent agency of the government, and where extension workers are mainly engaged in educational programs. This approach is rarely found in its purest form, and it is of "Utopian" or "ideal" existence.

2. Educational and service approach: this is the most prevalent type, especially in the underdeveloped

countries where it has been found that services are effective means of acquiring people's confidence in educational programs.

3. Educational, service, and regulatory approach:

This combined approach implies that educational programs are implemented through the use of services and regulations. This type might appeal to the underdeveloped countries. Examples are the U.A.R. where there are several regulations as regards irrigation to help control plant pests and where enrollment in cooperatives is compulsory, and in Jordan where extension advisors may represent the state in legal suits, e.g., land condemnations, violation of land rights, and crop damage. However, the most prevalent concept found in the literature is that Extension as an educational program. This orthodox description of Extension work is found in the texts of most Extension writers. Examples are: Penders (1956), Leagans (1962), and Kelsey and Hearn (1955).

Extension was typically viewed by Leagans (1962, p.4) as "... a change inducing process which involves as its basic elements the process of education". The same reference then describes extension education in terms of: Characteristics of agricultural extension work including:

1. Extension works with adults and young as learners in actual life situations, i.e., on their farms and in their homes and villages.

2. Participation in Extension programs in wholly voluntary.
3. Extension teaching programs may involve the entire range of agricultural and home making, but emphasizing the needs of the learners.
4. Extension teaching may be of such informality that it is difficult to distinguish between educational activities and services.
5. Extension as a public agency strives to "sell" people on the idea that they need to adopt new or improved practices for their own benefit, and not on the idea of profit making.

Extension Education

Wilson and Gallup (1955, p.4) define education as a process by which changes in human behavior are produced. Extension education aims to influence people to make such desirable changes in their behavior as will contribute to better living and home making. These changes in behavior, as desired results of extension education, may take these forms:

1. An increased amount of useful information and understanding of information, such as more knowledge about the basic seven foods, grass legume pasture or marketing of agricultural products.

2. New or improved skills, such as how to harvest and store legume hay to retain its feeding qualities, and how to package for market.
3. More desirable attitudes and ideals, such as balanced diets maintain good health and co-operative action may be necessary to solve a marketing problem.

Thus, the production of changes in behavior, through education, implies that the Extension teacher must clearly understand:

1. What specific changes in knowledge, skills, or attitudes are desirable.
2. Ways by which people can be appropriately influenced to adopt changes in knowledge, skills, and attitudes, in other words: "How to teach". The Extension teacher must have knowledge and understanding of different Extension methods and how to apply them.

Extension education has two elements; the teacher or the Extension educator, and the learner who is the farmer, housewife or rural youth. Before describing the steps in the process through which ideas and innovations are communicated between the Extension teachers and their client system, a number of concepts need to be defined. Concepts in Extension education include: teaching, learning, and motivation; Teaching is defined by Fenley and

Williams (1962, p.7) as the process by which the stimuli for influencing planned changes in behavior are transmitted.

Learning is the modification of behavior which occurs in the learner through his own action as the result of his receiving that which was transmitted by the teacher. Learning is defined by Rogers (1962, p.77) as "the relatively enduring change in the response to stimulus".

Learning is defined by Fenley and Williams (1962, p.7) as "the process through which changes in behavior and attitude are achieved".

Extension teachers can not ignore the fact that individuals have varying levels of desire to learn new or improved ways of farming and home making. Motivation of the learner is a key factor in effective teaching. It is necessary that extension teachers recognize and try to satisfy the following kinds of needs of people as suggested by Wilson and Gallup, (1955, p.5):

1. The desire for security; economic, psychological, and spiritual security.
2. The desire for new experience-adventure, new interests, new ideas, new friends, and new ways of doing things.
3. The desire for affection or response-companionship, gregariousness, and social-mindedness.
4. The desire for recognition - status, prestige,

achievement, and being looked up to.

Wilson and Gallup (1955, p.7) report that in addition to achieving motivation and helping individuals to meet their basic needs, the extension teacher must understand the following essentials of adult learning:

1. Adults learn best when they have desire to learn.
2. Adults learn best when they have clear cut goals to fullfill.
3. Adults learn best when they put forth an effort to learn.
4. Adults learn best when they receive satisfaction from what they learned.

Thus, it is important that the teacher in Extension knows how to plan and implement educational programs that will stimulate learning. Unless both teaching and learning are fully achieved there can not be education of the type which Extension strives to produce.

Wilson and Gallup (1955, p.6), report that the extension teacher, in his application to the concept inherent in extension education, should follow certain definitive yet interdependent steps in his effort to transmit new or improved practices in such a manner that will induce learning in his audience:

1. Getting the attention of the learner
2. Stimulating the learner's interest

3. Arousing the learner's desire for information
4. Convincing the learner that he should act
5. Getting action by the learner
6. Making certain that the learner obtains satisfaction

Socio-Economic Factors Influencing the Adoption of Practices

In addition to the extension teaching methods employed by the extension worker to bring about changes in the behavior of farmers and home makers, there are other factors that may exert some influence on the rate of adoption of Extension recommended practices. These factors are frequently out of the control of the extension worker. An awareness of their probable influence upon the use of extension information by farmers and home makers is helpful to the extension worker in selecting teaching methods and fitting them into a teaching plan. These factors were reported by Wilson and Gallup (1955, p.22) as follows:

1. Age of the learner: Wilson and Gallup (1955, p.22) reporting on the findings of a study conducted in 5 sample rural areas state that "age of the adult farm population is apparently not an important factor in extension teaching".

2. Previous educational training: When farmers were arranged on the basis of their previous educational

training, findings indicated by Wilson and Gallup (1955, p. 23) denote that "for both men and women, a significantly higher proportion of those with some college training reported the adoption of practices more than those with high school but no college training". It is also reported by the same reference that those with grade school education reported the least adoption of practices.

3. Influence of education upon coverage and takes to exposure was also noted by Wilson and Gallup (1955, p.20), whereby lack of response to educational stimuli is due primarily to inadequate coverage or contact with Extension means. In a society where educational opportunities are not the same for all of its members, those advantaged members are apt to participate in Extension programs. It is also reported by the same authors that the ratios of those changing behavior to those exposed to information are practically identical for the educational subgroups getting extension information with the same degree of intensity. As means of information diffusion were increased, the percentage of those adopting practices increased.

4. Size of farm, tenure, and location of farm: It was found by Wilson and Gallup (1955, p.23) that the "percentage of farmers and home makers adopting new practices and the rate of adoption of such practices tend to increase with the size of farm". As for land tenure,

it is whether the family owns or rents the farm on which it lives seems to have little bearing on the extent of use of extension information". For location of farm and home. Wilson and Gallup (1955, p.24) reports that data from field studies consistently show no difference in adoption of Extension-taught practices by farm families living within 15 miles radius of the county Extension office (in the U.S.A.) and those living beyond the 10 miles limits. Whether the farm home is situated on an improved highway or an unimproved road also seems to have no bearing upon the extent or rate of adoption of practices by farm men and women, these findings were reported by Wilson and Gallup (1955, p.24).

5. Socio-economic status of the farmer and home-maker: Wilson and Gallup (1955, p.24) report the findings of a study conducted in 1951-52 in Louisiana where it was found that "where farmers and home makers are high on the socio-economic scale, greater use is made of Extension information". The measure of socio-economic status which was used was the Sewell Scale - short form. The households were divided according to scores into "low" and "high" groups. Education was included in the Sewell Scale. Other items on the short form of farm family socio-economic status were; construction of house, room-person ratio, lighting facilities, water piped into house, power washer, refrigerator, radio, telephone, automobile, daily newspaper

wife's education, husband's education, wife's attendance to church or Sunday school, and husband's attendance to church or Sunday school, and

6. Contact with extension workers: According to Wilson and Gallup (1955, p.24), the extent to which farmers and home makers make contacts with members of the extension staff determines the adoption of recommended practices.

Field studies involving interviews with 10,733 farm families in sample areas of 16 States in U.S.A. reveal that in the case of 3 families out of 4, some member of the farm family - man, woman, boy or girl, 10 years of age or older - had at some time contacted an Extension worker. Of the contact group, 87 percent reported the adoption of Agricultural practices in contrast with 38 percent of the no-contact group.

In conclusion, field study data consistently show that a higher percentage of families on the larger farms and of farmers and home makers with more years of formal schooling make more contacts with Extension workers than do others. These findings were verified by Gibson in Wilson and Gallup (1955, p.25) who found the percentage of farmers reporting 3 or more different types of contacts with the Extension Service increased from 4 percent for the lowest quintile to 15 percent for the middle quintile, to 38 percent for the highest quintile, when grouped according to Sewell's socio-economic scale.

The Social Sciences in Relation to Extension

An effective extension program consists of a synthesis of technical and practical knowledge. It also consists of the construction and operation of channels of communication between rural folk knowledge and administrative authority at the other. Sociology, cultural anthropology, and social psychology are the social sciences that have developed knowledge of the groups that live and work at the two ends of these channels and, techniques for analyzing and understanding them. It was reported by Ensminger et al. (1951, p.177) that these sciences also possess the techniques that make possible continuous study of the interactions of the groups involved in the Extension work.

Some sociological concepts for analysing the process of change include:

1. Societies differ in their value systems: Every society has its own practices and beliefs which the members of that society consider the most important things in life. Through the years, elaborate institutions have developed to safeguard and perpetuate these values and the elders see to it that all young members of the group become thoroughly convinced with beliefs that sustain these institutions, e.g., initiative by the individual in the U.S., planning in U.S.S.R., and conformity to the Sharia in the Islamic countries.

2. Societies differ in their social organization:

Societies are already organized. Through time, every group has worked out a way of life and a set of social relations that are accepted as "normal" and considered to be the proper and right way of getting things done - institutions. The components of this social organization are the following:

a. The family: It is the unit of the society and through which cultural heritage is transmitted to each succeeding generation. Thus, anyone who assumes that an Extension program is possible when it contemplates merely educating individuals to act purely as individuals is doomed to failure in societies where families are the core of the society.

b. Maintenance institutions: These are the parts of the society through which its material needs are met. Every nation, regardless of whether it is highly developed or underdeveloped, has its own organized set-up to provide it with food, clothing and shelter. In the underdeveloped societies, usually, these institutions are of family scale. Thus, attempts to change modes of production must take into account the nature of the existing maintenance institutions.

c. Government: Government is the institution in society which maintains law and order, security, and which may promote the welfare of the nation. Governments

are found in all types of groups and nations regardless of their degree of development. In rural areas, governments function less than in urban areas, and the rural folks are usually suspicious of government's programs. The acceptance of any education program is positively correlated to the degree of local leadership participation in the planning and implementing of that program.

d. Education: Education is that institution which aids in the preparation of the young for adulthood by injecting into them the basic social values and developing the necessary skills for the members to participate in the life of the group. Social sciences have found that the speed of social change seems directly correlated to literacy and educational attainment.

e. Religion: This element of the society represents man's adjustment to the uncontrollable forces of his universe. It seeks to orient the individual to these forces and to acceptable behavior toward his fellowmen. Religion provides not only a value system and beliefs, but also professional religious leaders who interpret to the believers the teachings of religion. History is full of instances where fanatic religious beliefs have been in opposition to social change. But in educational programs for social change, much depends on the training of local religious leaders. However, History also indicates that much of social change was brought about by religion.

3. Societies differ in their status systems and patterns of leadership: Every society has its own ways of ranking individuals at the top, the middle, or at the bottom of the social hierarchy. Persons in each echelon are expected to perform roles that are appropriate to their positions. The status system is directly connected with the social values that are shared between the people. Since every program needs leaders, Extension must not only rely on the institutional-traditional leaders, it must also include representatives of the various social strata. This approach will tend to secure the acceptance of the concerned programs by all segments of the society. In every society, the extension worker who is trying to make changes may be expected to find one of three attitudes among his client system: acceptance and cooperation, hostility, and resistance, or apathy and indifference. People who are not oppressed or who are not generally dissatisfied tend to be alert, cooperative, and rational when faced with changes in their way of life. However, those who are experiencing severe physical, social, and/or psychological stresses may react by having either a high degree of hostility, apathy, or indifference to change. Therefore, the extension worker may be faced with either negative reactions or no response when people are suffering such as are those in the underdeveloped countries of the world.

4. Social behavior and communications: Extension

plays the role of a dynamic medium between rural folk on the one hand and scientific and administrative authorities on the other. For Extension to bear its desired results, a smooth functioning of a two-way process of communication from the farmer to the scientist and administrator, and from the scientist and administrator to the farmer; improved practices and solutions to problems. The extension worker and his program will suffer if the channels of communication between the two groups are inadequate and ineffective. Social sciences have made a considerable contribution to Extension in this respect. The analyses of group dynamics and the knowledge it affords, keep concerned authorities alert to the possibility of adopting more effective communication media. By virtue of such analyses, sociologists can offer the following observations to Extension communication media specialists:

a. Each culture has its own local means of communication which ought to be relied upon by Extension workers.

b. Every means of communication has two aspects; (1) the tangible physical aspect; and (2) the less tangible or social psychological aspect. Thorough study of the social psychological aspect is of paramount importance. Thus a poster demonstrating a pig to illustrate the essentials of feeding is certainly a great failure in a moslem community where pigs are not an accepted livestock.

c. The personal touch in human relations is an outstanding characteristic of folk cultures. Such aspect could be utilized by Extension in underdeveloped areas where formal official business-like channels of communication are rarely used.

d. Extension workers should understand that both the rural folks and the scientific-administrative authorities have their own channels of communication which differ in various degrees from each other. One of the primary tasks of Extension workers is to recognize and understand these differences, and then to work at bringing of the two systems of communications closer.

Conclusions: Social change parallels economic development in underdeveloped areas where drastic changes in the social organization and established patterns of life of the people are brought about. These patterns are sanctioned by beliefs that their customs and practices are good enough to remain. Leader-follower patterns will be changed, old social institutions will be disturbed, even religious beliefs will have to change. It is not impossible that more harm than good could result unless the changes are initiated and accomplished with the greatest understanding of the local social systems with its cultures and cultural patterns. Sociologists' tools of investigation, though not as exact as those of the physical scientists, can provide basic information to assist all

those who work with backward groups. Thus, the information provided by the sociologists can be of great significance to those who plan for social and economic development. The foregoing conclusions were reported by Ensminger et al. (1951, p.191).

APPENDIX B

Year -----

DATA COLLECTION SCHEDULE

Methods	Check (/)	Number of times used	Number of contacts	Remarks
<p>INDIVIDUAL:</p> <p>1) Farm and home visits. 2) Office visits by farmers. 3) Telephone calls. 4) Personal letters. 5) Result demonstrations. 6) Others.</p> <p>GROUP:</p> <p>7) Method demonstrations. 8) Meetings at result demons. 9) Subject matter meetings. 10) Program planning meetings. 11) Tours. 12) Others.</p> <p>MASS:</p> <p>13) Publications. 14) Radio programs. 15) Circular letters. 16) Newspaper articles. 17) Exhibits. 18) Others.</p> <p>INDIRECT:</p> <p>19) Trained local leaders. 20) Others.</p>				

Year -----

ORGANIZATIONAL FACTORS

1) Numbers of staff members:

- a) Administrators -----
- b) Area Inspectors -----
- c) Block Supervisors -----
- d) Specialists -----
- e) Advisors -----
- f) Others -----
(Agricultural officers)

2) Training meetings or conferences re Extension methods:

- a) Kinds -----
-
-
- b) No. of participants -----
-
-
- c) Duration -----
-
-

3) Transportation facilities for field staff:

- a) Kinds -----
-
-
- Numbers -----
-
-

4) Statements re objectives and aims:

Year -----

SOCIAL AND ECONOMIC FACTORS

I. Population:

- A. Total number of population -----
- B. " " " rural population -----
- C. " " " urban population -----
- D. " " " Bedwin population -----
- E. " " " farmers population -----
- 1) Farmer owner-operators -----
- 2) Tenant farmers -----
- 3) Sharecroppers -----
- 4) Agricultural labourers -----

II. Education:

- A. Total number of schools:
- 1) Primary schools -----
- 2) Secondary schools -----
- 3) Colleges -----
- 4) Vocational (agr.) -----
- 5) Others -----
- B. Level of schooling by age groups (males):

NUMBERS OF INDIVIDUALS

Age Groups	Primary	Secondary	Advanced	Vocational	Others
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Year -----

III. Social Groupings (rural):

A. Farmers cooperatives:

1) Number -----

2) Number of members -----

B. Youth clubs:

1) Number -----

2) Number of members -----

C. Others.

IV. Levels of Income:

A. G.N.P. -----

B. G.N.I. -----

C. G. Agr. Income -----

D. G. Agr. Loans -----

V. Communication Media:

A. Telephone:

1) Total No. -----

2) Public sets -----

3) Private sets -----

4) No. of telephone sets at
advisors offices -----

B. Radio sets:

1) No. -----

C. Others:

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