1971

Factors Associated With Farmers' Perception of Agricultural Extension in Antioquia, Colombia.

Fabio Augusto Zapata

Louisiana State University and Agricultural & Mechanical College

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OF AGRICULTURAL EXTENSION IN
ANTIQUIA, COLOMBIA

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
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in partial fulfillment of the
requirements for the degree of
Doctor of Education

in

The Department of Extension Education

by

Fabio Augusto Zapata
Ing. Agr., National University of Colombia, 1965
M.S., Oregon State University, 1967
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Candidate:  Fabio Augusto Zapata

Major Field:  Extension Education

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Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Edward W. Bassie

Everett P. Ray

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ABSTRACT

This study was an attempt to determine the clients' (farmers') perception of the extension agent and the extension service in Antioquia, Colombia. It also sought to determine the factors associated with these perceptions.

The study included the three main extension organizations operating in Antioquia and 370 clients were interviewed. A combination of probability and non-probability sampling was used in order to include approximately equal numbers of clients for each organization. A Likert-type scale was used to measure clients' perception. The scale was pretested twice and an item analysis by the method of comparison of extreme quartiles was made, using the interviews of the second pretest. Selected independent variables were defined, using comparative rating scales. The statistical techniques used were Chi-square, Kruskal-Wallis One-Way Analysis of Variance, Analysis of Variance and Correlation Coefficient, when appropriate.

The study revealed that the organizations' clientele were as different as the organizations themselves. The Federation's clientele were the ones who requested more advice from
extension personnel, learned more practices, used more practices, had more practices related to sources of income and had better perception of the extension agent than the clientele of ICA and the Secretariat.

A positive association was found between the favorableness of clients perception of the extension agent and years of schooling, economic status, practices learned, practices used, knowledge of agricultural concepts, mass media exposure, contact with and knowledge of extension organizations. No association was found for age.

It was found that the clients' perception of the extension service was not associated with clients schooling, economic status, level of contact and age.

When perception was examined within the organizations, the associations found were somewhat different to those found for the whole sample. For ICA clients, perception was associated with economic status, practices used, mass media, knowledge of agricultural concepts, level of contact with and knowledge of extension organizations. Perception of the Extension Service was associated only with knowledge of agricultural concepts and knowledge of extension organizations.

For Federation clients, there were associations only with practices learned and practices used with perceptions of the Extension agent. For perception of the Extension Service, there was an association only with practices used.
For Secretariat clients, positive associations were found with practices learned, practices used and level of contact. There were negative associations with economic status and knowledge of agricultural concepts with perceptions of the Extension agent. For perception of the Extension Service positive associations were found with practices learned, practices used and levels of contact. There were negative associations with years of schooling and economic status.

The most significant finding was that only the number of practices used was associated with favorableness of clients' perception for all of the three organizations.

Three main conclusions were drawn from the study:

1. Some problems must exist with Extension work in Colombia;

2. It is necessary for each organization to revise its extension program and the methodology used to carry it out; and

3. The most important thing for extension is what the farmer (client) does, and that he does it successfully. The economic aspect is the most important factor.
ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

This chapter presents the problem where the relation of perception with the extension service is emphasized as well as the purpose of the study as it applies to Antioquia and the extension organizations under study. It also includes the definition of terms.

The Problem

The main function of extension is informal education in order to bring about changes in knowledge, attitudes and skills in people which will aid individual and social development (8, p. 23). Writers, such as Byrness (38, pp. 242-256) and Niehoff (12, pp. 13-40) have stressed the importance that the perception of new techniques by people plus perception of the extension agent, had on the client (farmer) in the adoption of new techniques. This seems to be a transfer of the findings made by psychologists of the importance that the perception of the task, as well as the perception of the teacher, has on the learning process.
This study, consequently, is trying to determine the way the clients or users of the extension services in Antioquia see or perceive the extension services and the extension agents. Favorable perception towards the service and the agent is an important factor in carrying out programs designed to bring about sociocultural changes in the clients.

As W. I. Thomas (11, p. 421) said, "If men define situations as real they are real in their consequences". This means that if the clients define or see the extension service and the extension agent as helpful or important for them in finding ways to solve their own problems, they are likely to accept their teachings, otherwise they will be uninterested. The efforts of the extension men will be futile and resistance to change will be evident.

Although there is not an economic focus per se, the three organizations in the study are investing money and human resources trying to raise the socio-economic level of the campesinos (peasant farmers). By this study of perception one can get an idea of the impact they are having on their clients, and based on it to determine the type of organization that is likely to produce better results.
Purpose of the Study

This study is important not only for the extension organizations involved but for the whole country because:

1. It will show how the clients or users of the extension services in Antioquia perceive the services and the agents in charge of teaching them to use new agricultural practices and techniques.

2. By knowing the clients' perception of the extension services, it is possible to reinforce those aspects which are related to more favorable perceptions and to develop new strategies for helping those who have unfavorable perceptions.

3. It can give an idea of the effectiveness of the extension service and its employees in reaching people with their programs.

4. It will suggest, hopefully, some aspects which need more emphasis in order to make the extension services more effective, particularly in developing good relationships between clients and the extension organizations.
5. It explores and suggests new research which will answer more specific questions.

6. From a theoretical point of view, this study can be used to develop new policies and new philosophies in the different extension organizations.

**Definition of Terms**

For the purpose of the study the following terms are defined:

**Agricultural Extension Service:** As used here is the services organized by Colombian Agricultural Institute (ICA), Secretariat of Agriculture of Antioquia or the Coffee Growers Federation to extend to clients (farmers) new techniques and technology.

**Extension Agent:** A professional (Agronomist, Veterinarian, etc.) employee of the Agricultural Extension Service who carries on work with farmers.

**Práctico:** A non-professional technician employed by the Agricultural Extension Service who works under the direct supervision of the extension agent. The práctico sometimes has more direct contact with farmers than does the extension agent.
**Work Front:** This term is used here to refer to an area in which a Práctico works where extension projects are carried out in order to improve the community. ICA's work fronts are part of a Municipio. For the Secretariat of Agriculture it includes several Municipios, except in the Experimental Nucleos which include only one Municipio.

**Extension Agency:** This term is used here to refer to an area in which an extension agent works. The extension agency includes from one to six work fronts. The extension agency may have two extension agents, an agronomist, a veterinarian, and a home economist and perhaps other personnel whose work is coordinated by the extension agent chairman.

**Municipios:** This is similar to a county in the United States. It is a local government unit. It is usually organized around a city or town that serves as the marketing center to which most people come once a week.

**Credit:** As it is used here it refers to the practice of borrowing money by clients.

**Improved Practices:** As it is used here refers to those new practices derived from improved technology that are taught to the clients by the extension agents or prácticos.
Clients: Usually farmers (campesinos) that appear on the list that prácticos or extension agents have in their office. These clients are called users of the extension service. Only men were considered eligible for the study, although some lists included women too.
CHAPTER II

THE GEOGRAPHICAL AND INSTITUTIONAL SETTING

This chapter presents the geographical setting of the study and a brief historical review of each one of the three extension organizations under study, the Colombian Agricultural Institute, the Coffee Growers Federation, and the Secretariat of Agriculture of the State of Antioquia. The main objective of the historical review is to familiarize the reader with some key aspects of the evolution of the extension services of these organizations.

The extension concept in Colombia has been in existence for about forty years, but different factors have made it impossible for it to achieve full development. Under the Ministry of Agriculture, an extension service began initially in 1930 when extension was mentioned for the first time in Colombia in a report, but only in 1947 as result of the Johnson Mission did Extension start to work with a fully developed philosophy.

In the Coffee Growers Federation, extension started in 1927-8 when the federation was created in order to help the coffee grower. Within the Secretariat of Agriculture, extension began in 1946, although the Secretariat itself was established in 1929.
The three extension organizations have tried to avoid duplication of effort. In 1959 an agreement was signed between the Secretariat of Agriculture, the Coffee Growers Federation and the Ministry of Agriculture by which the state was divided in 22 sectors, twelve for the Secretariat, five for the Coffee Growers Federation and five for the Ministry of Agriculture (59, pp. 2-6).

Geographical Setting

Colombia is divided politically and administratively into 22 States, three Intendencias and five Comisarias. Antioquia is one of the States and is located in the Northwest part of Colombia (see Figure 1).

Antioquia is composed of 62,870 square kilometers and its topography is determined by the two Andean mountain ranges (West and Central) that cross its territory from South to North. The Central range in Antioquia is divided and sub-divided into several ranges which make it, the most mountainous state of the country. This condition causes Antioquia to have a wide variation in climates from hot to cold.

Antioquia has one of the largest population growth rates in the country. According to the 1964 census, Antioquia had a 3.52 per cent population growth rate compared with 3.20 per cent for the nation. The population for Antioquia in 1969 was estimated at 3,019,160 inhabitants out of 20,449,503 in Colombia (49).
Figure 1. A MAP DEPICTING ANTIOQUIA'S LOCATION IN COLOMBIA
Antiquia's population break-down in urban and rural segments were as follows:

Urban 1,720,719 - 56.9 per cent
Rural 1,298,441 - 43.1 per cent

According to provisional data from the 1970 agricultural census (48, p. 11) in the 37,626 square kilometers of farm land in Antioquia, there were 196,297 farms, of which 122,883 were operated by owners, 10,969 were renters and 62,445 were classified as others. The rest of Antioquia's area (25,244 square kilometers) includes free land or state land, roads, urban areas, rivers, etc.

According to the 1970 coffee growers census (20, pp. 8-10), Antioquia had 50,169 coffee farms in an area of 8,431 square kilometers. The average size coffee farm was 16.8 hectares and each one had an average of 3.09 hectares in coffee. Out of these farms, 49,874 were operated by owners, 218 by renters and 77 were classified as others.

Based on the list of clients obtained in August 1971 for the study and assuming they are representative, in Antioquia the

---

1For the break-down of urban and rural, it has been considered that communities with 1,500 or more inhabitants were urban; those with less were rural. See Departamento Administrativo Nacional de Estadistica. Boletin Mensual #202 pp. 6-8.
three agencies of the Colombian Agricultural Institute were assisting 1,401 clients (see Appendix B). The eight agencies of the Coffee Growers Federation were reaching 5,580 farm clients (see Appendix C) and the 31 agencies of the Secretariat of Agriculture were working with 3,131 farm clients, based on an average of 101 clients for the ten agencies that provided lists (see Appendix F).

As the State of Antioquia had a total of 196,297 farm families and the three extension organizations were reaching an approximate total of 10,000, these represent about 5 per cent of the farm families of Antioquia.

COLOMBIAN AGRICULTURAL INSTITUTE

History of Extension

In 1930 the chairman of the Department of Agriculture and Animal Science reported that agronomists were in charge of carrying out campaigns to stop insects and plant diseases, and stressed the need for research as the basis for extension work. In this report of the Ministry of Industries to the Colombian Congress, the word "Extension" was mentioned for the first time (56, p. 76).

In 1947 a United States Mission came to Colombia. This Mission was headed by a Mr. Johnson, a specialist on research, and it included Mr. Denneth Guthrie, a specialist in extension
work. The Mission formulated a series of recommendations and suggestions that were studied and adapted by the Ministry. Among the suggestions were the creation of three Divisions, research, extension and natural resources. At this time extension started to work for the first time in the country with a philosophy of extension as it is generally accepted today (56, p. 156).

In 1952 the Ministry of Agriculture was organized into the three divisions suggested by the Johnson Mission—research, extension and natural resources—and in November of that same year a contract was signed with the United States Department of Agriculture for the establishment of the "Servicio Tecnico Agricola Colombiano - Americano" (STACA) for the purpose of developing "Proyecto Piloto de Extension" in the State of Boyaca.

The project started in June 1953 as part of the Ministry of Agriculture, and in the State of Boyaca the Extension Service began in 1954. This was a systematic project that brought to the country the extension agent, the home economist and the 4-H Club assistant and this organizational form was adopted by the Ministry of Agriculture, the Coffee Growers Federation and the Secretariat of Agriculture in Antioquia (56, pp. 186-190).

The Extension Service established by STACA diffused throughout the country and in 1960 the Ministry of Agriculture had 46 extension agencies which worked through the "Zonas Agropecuarias" (56, p. 287). The Zonas Agropecuarias were
created by Executive Order 1169 of July 3, 1958, based at the
Experiment centers and stations of the Department of Agricultural
Research. Here for the first time there was an intent to put to
work research and extension together since, although they were
under the Ministry of Agriculture, they worked independently.

STACA was closed out in 1962 with debatable results.
According to Rice (27, pp. 141-142), this was the only U.S. type
extension program not to survive out of twelve attempted in
Latin America. Out of its three main objectives - 1) increased
incomes in the area, 2) trained Colombians in extension, and
3) a developed and stable extension organization - only the
training aspect was successfully concluded, at least to the
extent of preparing a group of Colombians skilled in the method
of "demonstrations". The emphasis of the training project was
on extension methods rather than technology. The main reason
for the failure of this project was that the initiative was
never transferred from the United States to a Colombian program.

The Ministry organized the Department of Agricultural
Research (DIA) in 1955, and the extension division was made
part of the Board, but without a vote. DIA became the
Division of Research in 1963 when the Colombian Agricultural
Institute (ICA)\(^1\) was created by Executive Order 3116 of 1963

\(^1\)From this point on the term ICA will be used to signify
the Colombian Agricultural Institute.
ICA was created in order to integrate research, teaching, and extension.

In 1966 by Executive Order 603 the "Institutos Tecnicos Agricolas" (ITAS) were created and they began operation in 1967 to train extension practicos.

In 1966 ICA also presented for consideration of the Ministry a project by which the extension service division would be transferred to ICA. This project was agreed to and on August 1, 1967, ICA received from the Ministry 23 Agronomists, 23 Home Economists and 23 agricultural practicos to begin its extension operations (56).

This contract, signed by ICA and the Ministry of Agriculture, set up as the main function of extension the promotion of the use of research results for the purpose of producing an integral development of agriculture and livestock in the country and to set up an information service at the national level to inform the farmer and the cattleman of technological research results (26, pp. 42-48).

The first major undertaking by ICA was to set up a policy for the organization of the extension service and the relocation of Extension agencies (26, pp. 5-29). Among the most important aspect of this policy were: 1) work with the users or clients through organized groups where the clients
took part in planning and programming of work; 2) as there were budgetary problems, there was a limitation of the number of agencies and their final location was determined by a selection process which included among others the following criteria: area of actual and potential production, no large coffee plantations or commercial farms, high number of agricultural farms and farmers, large area of influence, land ownership, availability of public services, etc; 3) extension was to work through four main programs - agriculture and livestock, home improvement, rural youth and farmers organization; 4) training of personnel to make them capable of transmitting complex agricultural technology. It also included cooperation with schools of agriculture and other organizations.

In 1968 ICA, by Executive Orders 2420 and 3120 of September 24 and December 26, received new functions in the form of the extension services of the "Instituto de Fomento Algodonero, Instituto Tabacalero and Zooprofilactico" (Cotton, Tobacco and Veterinary Institutes).

The new functions made it necessary to restructure ICA. The name, agricultural extension service, was changed to rural extension service in order to provide it with a wider conceptual base than the earlier description.
Due to financing problems, ICA used the following criteria to organize the rural extension service (25, pp. 7-18): 1) To work only with organized groups of farmers, using mass media communication methods and giving priority to real needs rather than felt needs; 2) Do not consider as stationary the extension agency headquarters. After a 3-5 year period, it would be moved to another place which required help, based on the criterion of improvement for the largest number of people; 3) Use of technical mobile groups; and 4) Determination of problems based on simple socio-economic studies.

ICA's extension service set up quantitative goals of reaching 2000 families by each agency in the three year period of service in a locality. The goal was to be achieved in this way; first year - 700, second year - 1,500 and third year - 2,000 families.

Credit

Credit was considered important by ICA. In June 1, 1968, ICA signed a contract with the Agricultural, Industrial and Mining Credit Bank to coordinate extension work and credit in order to help increase the production of small and medium-sized farmers. Through this contract ICA agreed to provide technical assistance to the farmers and to inform the bank of its program of work and the credit needed. The Bank agreed to provide
credit to those farmers who owned an economic unit and met all of the requirements demanded by the bank in order to allow credit (24, pp. 107-111).

The extension personnel of ICA had used this type of credit and in the annual report for 1970 region four, which included the three extension agencies of Antioquia, had 176 loans made to its clients (23, p. 16).

**Personnel Training**

This aspect was considered important by ICA. When it received the extension service from the Ministry of Agriculture, the first step was to conduct an intensive training course for the personnel who had been transferred (26, pp. 7-8). ICA also had an extension training program sponsored by the Kellogg Foundation and the Nebraska Mission, for the development of personnel through overseas training. There is still much to be done, unfortunately. The training of practicos and extension agents was not very good as reported by Gutierrez (52, p. 46). He observed that most of the demonstrations had little relevance to client situations and the topics were considered inappropriate.

**Clientele and Area**

ICA had three extension agencies in Antioquia in the Municipios of Frontino, Urrao and Sonson (see Figure 2). For each agency it had four or five work fronts. Each work
Figure 2. A MAP DEPICTING THE COLOMBIAN AGRICULTURAL INSTITUTE EXTENSION AGENCIES IN ANTIOQUIA

- Extension agency headquarter
- Area where interviews were made
front covered two or three neighborhoods (veredas). This reduced the area covered by the extension agency to only part of the Municipio because a Municipio could have 30 or more veredas. The target clientele of the extension service were those farmers who were living in the work fronts and could increase production and productivity (25, p. 3).

**Extension Agent's Functions**

The extension agent was an Agronomist. He was responsible for the organization and work of the extension agency. His main function was education and it was expected that through his actions changes would be produced in attitudes, related to major economic returns.

Among other functions he was expected to apply all extension methods adapted to the locality in order to achieve adoption of new knowledge by the clients. He was responsible for supervising and coordinating the work of the agency personnel, especially its four to five practicos. He worked on the four basic programs, adapting them to the real needs of the locality.

Extension work was carried out mainly through individual contacts, group meetings, result demonstrations and regional field trials. The extension agent was expected to follow the procedure stated in the publication of extension No. 4 (24, pp. 27-29) in the conduct of his job.
Although ICA expects for projects to emerge from meetings with local people, this was done only in a few cases. The standard procedure was that the practicos from their own contacts with clients, presented projects which were approved by the extension agent and the upper hierarchical levels. Gutierrez (52, p. 45) in a few cases found evidence of local agricultural coordinating committees, but the committees were made up by directors of local government agricultural agencies with little or no clientele participation.

Gutierrez (52, p. 39) mentioned that the extension agents were expected to comply with instructions from regional directors, national directors of extension and national coordinators on one side and for the other side utilize the clients' recommendations. This often became conflicting and was a source of dissonance and dissatisfaction for local extension agents.
Coffee growing began in Colombia about 1723, but it did not become commercial until 1821 when the government by law forbade the introduction or importation of coffee.

In 1834 the first exportation was made of 156 tons of coffee which equalled 2.62 per cent of the total Colombian exports. After some ups and downs in production due to the civil wars, coffee production grew.

In 1927 coffee exports were 71 per cent of the total value of Colombian exports, consisting of 2,659,577 sacks of coffee (42, p. 4).

History of Extension

In 1904 twenty coffee growers met and created the association called "Sociedad de Productores de Café". This society brought certain economic advantages for the growers, but in 1906 the Society became a member of the "Sociedad de Agricultores de Colombia" where a coffee section was formed. In the middle of a coffee price crisis, the First National Congress of Coffee Growers was convened in July, 1920 (54, pp. 23-24).
This congress produced several recommendations but none were carried out. In June 1927 they met at Medellin for the second National Coffee Growers Congress that produced "Agreement 2" by which a "National Coffee Growers Federation" was created as an organization made up of individuals interested in the coffee industry throughout the country. The newly formed Coffee Growers Federation in its ordinary meeting of August 11, 1927 approved a project by which the government was authorized to levy a 10 cent tax on each 60 kilograms of coffee to be exported. This tax was designed to produce annually about $250,000.00 pesos for Federation activities (42, pp. 4-5). This project became Law Number 76 of 1927 (Nov. 14) which among other things established that the Federation was responsible for the implementation of better systems of coffee cropping and bean processing.

The Government signed a contract with the Federation on October 15, 1928 and it included a by-law by which the Federation would maintain not less than ten Colombian employees who were experts on coffee and bean processing in order to make recommendations to the coffee growers on the best systems of cropping, use of fertilizers, tools, machinery, etc. (21, pp. 11-20), and

1From this point on the term Federation will be used to signify the Coffee Growers Federation.
in 1929 the first Agronomist was appointed for extension in the State of Caldas (56, p. 75).

In order to train farmers and to conduct research, an Experiment Station and several combined Experimental Agricultural Station-Schools were authorized in the States in 1929 by the third National Coffee Growers Congress. The Experiment Station started in June as "Granja Escuela Central del Cafe" (41, pp. 53-70) and in 1930 the Federation appointed the first two "Practicos Cafeteros" alumni of this Station-School who were to be in charge of diffusion of technology and development of coffee production. Here, it seems began the Federation policy of hiring solely "practicos" who had finished studies at its own schools. The Federation Extension Service grew at such speed that by 1939 it had 12 Agronomists, 85 Practicos and 31 Coffee Mechanics (56, p. 80).

In 1934 the Federation asked the Government for a higher tax on each bag of coffee for export raising it from 10 cents to 25 cents for a bag of 75 kilograms (21, p. 253). In 1937 the Federation contracted the services of Dr. Paul Shauferberger to begin a systematic study of the soils in the coffee area and it started the "Campaña de Café" (Coffee Campaign) of the extension service (56, p. 101).
In 1938 the Federation established three campaigns: a) plant protection, b) soil conservation, c) coffee beans processing (21, p. 336). Also in 1938 the bounty system was established by "agreement 4" stating that those growers who had less than 10,000 trees and in a poor economic situation should do what the extension personnel recommend. The State Committees were forced to invest not less than 40 per cent of their budgets in the campaign, "coffee improvement" (saneamiento de plantaciones) (21, p. 337).

In 1945 the Federation added two campaigns to its extension work, soil conservation and crop diversification (22, pp. 409-410). In 1946 due to a shortage of food production in the country, the Federation adopted a plan of intense activities directed at food production and a plan to teach children and farmers through the "concentraciones rurales" (45, pp. 73-90). These types of schools opened in 1947 with 97 students and by 1970 they had 7,000 students. They had trained by 1970 31,000 children of coffee growers. These school programs were transferred to the Extension Service in 1959. The alumni of each school had been organized in the "Club Futuros Agricultores de Colombia" which had their own regulations and which promoted leadership development.

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*Bounty refers to a subsidy offered by the extension service organizations to induce their clients to do whatever was suggested by the extension agents or its personnel.*
In 1957 a campaign called "tecificación de cafetales" was established. It consisted of planning and supervision of the resources lent by the coffee bank to the coffee grower.

In 1959 a stage originated that was described by Suárez and Arze (44, pp. 53-74) as extension work based mainly on individual assistance. In effect that year the 21st National Coffee Growers Congress (40, pp. 77-79) met, and by Agreement 3 decided to group under the generic name of extension the following campaigns that were working with independent budgets, 1) soil conservation, 2) extension work on coffee and others (campañas tecnicas de extension), 3) directed credit and advertising, 4) soil studies, and 5) fertilizers and compost. The Congress also included within the extension service the formal education programs because the main function of extension was to train the coffee grower and his family in improved agricultural techniques so that through their application they could increase their income and level of living.

According to Valenzuela (34), this was a fact of significant importance because it put an end to the paternalistic period and brought on the age of education in the field. In this report Valenzuela asked that the bounties be converted to a fund for a special type of credit. The amount of the bounties were less and less every year and at the time of the study they no longer existed.
In 1965 Valenzuela (32) reported that the acceptance by the coffee grower of the extension agent's recommendations without the use of bounties shows the effect of the educational work and the coffee growers freedom from paternalism.

The extension service organization, according to Rodriguez (28), was based on the extension district, which was similar to a work front. It was directed by a practico under the supervision of the extension agent who was the head of the section. The area of the district was between 1,000 to 1,500 hectares and with a population that ranged from 200 to 400 families on coffee farms. Above the District came the "Seccional" made up by several Municipios which because of importance in growing coffee, locale, roads, etc., could be grouped under the direction of the extension agent or section head. The extension agent was responsible for programming, supervision, execution and coordination of the work of the practicos in order to carry out the philosophy of extension, based on the National guidelines.

In 1962, a mission came to the State of Caldas from "Comite Interamericano de Desarrollo Agricola" (CIDA). Its purpose was to prepare an integrated and comprehensive program for social and economic development in the State of Caldas, this being one of the most important steps taken towards an integral and harmonious economic development program for a region (33).
In 1966 one of the most revolutionary ways of work was originated by the Federation; the friendship groups. Arze (37, pp. 75-59) presented a discussion project (ponencia) to the first National Meeting on Agricultural Extension, where he made an analysis of families and neighborhoods in the coffee region (State of Caldas) and concluded that the group of friends among neighborhoods could and should be used by the extension agents in their work. He stated that neighborhoods affected the diffusion and adoption processes in the locality and they must be used to accelerate technological change.

The Federation policy on personnel, other than training, was characterized by stability. Antioquia State had 8 extension agents and only one of them had less than five years of service with the Federation and four had more than ten years. In July 1971 the extension personnel of Federation in Antioquia consisted of 8 Agronomists, 38 practicos and 6 coffee mechanics.

Credit Programs

Credit was one of the things which concerned the Federation for a long time as something absolutely necessary in helping the coffee growers. In 1932 the Fifth National Coffee Growers Congress by agreement 3 created the "Fondo Rotatorio", with $50,000 Colombian pesos set aside to lend money to the small coffee growers (21, p. 212).
In 1957 the Federation made the first attempt to direct and orient the credit systems offered by the banks towards the coffee regions. In 1959 the Federation created the "Credito de Sustitucion" as the result of an agreement between the Extension Service and the Agricultural, Industrial and Mining Credit Bank. It was considered the first trial for credit diversification and the Federation created also the "Credito de Fondo Rotatorio" to be managed by the Coffee Bank (43, pp. 29-73).

In 1961 the Coffee Growers had an operational "Fondo Rotatorio" and the Federation reached an agreement with the coffee bank to develop a type of direct credit for the renovation of old coffee fields (43, pp. 29-73). This seemed to be what was called the first trial in coordinating credit with the extension service (19, pp. 110-129).

At the time of the study the Federation had in Antioquia two main types of credit for the Coffee Growers. These credits were managed by the Coffee Bank and were as follows:

Fondo Rotatorio de Credito: The Fondo Rotatorio of Coffee Growers Credit was a special credit service for coffee growers, established by Agreement 6 of 1959, 21st National Congress of Coffee Growers. This fund had as its main object credit for improvement of coffee growers, socially and economically, which could not be handled directly by the Coffee Bank (16, p. 1).
Credito Cafetero planeado por el Servicio de Extension: This type of credit was a joint effort from the Coffee Bank and the Extension Service of State Coffee Committees. It looked for more efficiency in their work. Credit and technical assistance was coordinated in order to provide for the coffee growers the resources necessary for their economic and social improvement by an increase in production and diversification of their income.

How Farmers Got Credit: A client or potential client of the Federation Extension Service by his own initiative or induced by the extension agent asked the extension agent for a loan. The extension agent and the farmer filled out an application form with a detailed plan of investments, indicating the specific amounts of money needed for each practice and a repayment plan based on 50 per cent of the net income increase for the use of the money (credit).

After this was done, the extension agent mailed the application to the Bank who in turn informed the extension agent of its approval or rejection. If approved the client went to the Bank for the first time with the extension agent where he received the first installment and signed the contract by which he committed himself to accept the technical assistance and supervision of the extension agent and to pay back the loan according to plan. The extension agent had to report to the
Bank about the usage of the money by the client. If done according to plan, the client was eligible for another installment. If not, the loan was cancelled and the Bank called back the money advanced. This process was repeated as needed, according to the size of the loan and the type of work to be done.

**Personnel Training**

This was another aspect that worried the Federation for long time as a means of developing more capable personnel to carry out its functions of teaching and diffusion. In 1934 the Sixth National Coffee Growers Congress by agreement 4 authorized the Federation Director to send some Colombian Agronomists to study in foreign countries (21, p. 249).

In 1937 the Federation established a required course on coffee for all agronomists, experts and practicos in order to make them more capable of carrying out their functions of teaching and diffusion (21, p. 297).

When the extension service was reorganized in 1960, an intensive training program on the new philosophy and work techniques was started. At the end of 1960 all extension personnel had taken a short course on extension (28).

By 1970 the Federation had offered 147 courses on agricultural extension, rural sociology, program evaluation, leadership, social groups, etc. (19, p. 110) to its extension professionals and to
many of its practicos at the local level, directed by the
extension agents working at the regional level (43, p. 29-35).

The Federation policy of emphasizing training for its
personnel still holds today. Every year all extension agents and
practicos must complete at least one course.

The Use of Friendship Groups

The friendship group concept had its origin in a study
made by Arze (37, pp. 75-79) in the State of Caldas in 1966. It
was implemented in 1967 when the Federation started a training
program for its extension personnel on social groups and
leadership.

The friendship groups were organized in this manner. The
extension agents first located the leaders in their area of
work, held meetings with them to explain what the plans were
and tried to interest the identified leaders. If the leaders
were interested, the extension agent asked each one to gather
his friends for a talk. At this meeting or in subsequent ones,
the farmers chose the projects they were interested in, and
democratically elected a coordinator to serve as the link
between the group and the extension agent.
The work with the friendship groups showed that it was possible to renew coffee fields in small plots without credit (19, pp. 113-114). Rodriguez (43, p. 36) stated that the work with friendship groups changed the work of extension agents from individual contacts in which only a small number of farmers were worked with to a system of work which offered contact with a larger number of coffee growers and their families.

By June 1971 there were 819 friendship groups in the country with 8,849 members, and in the state of Antioquia there were 67 groups with 810 members (51, p. 8).

Clientele and Area

The Federation clientele were basically coffee growers. The extension agent or practico helped any farmer who asked for advise on any crop, but their interest was mainly in the coffee grower who was the one who was paying for his services.

The Federation in Antioquia had 8 extension agencies or Seccionales (see Figure 3), distributed over the coffee area of Antioquia. The area covered by the extension agency decreased as the production of coffee increased.

Extension Agents' Functions

The extension agents were expected to plan work for the coffee year, starting in October. In this plan the extension agent or practico wrote down all the activities he planned to
Figure 3. A Map Depicting the Coffee Growers Federation Extension Agencies in Antioquia
carry out: demonstrations, farm visits, meetings, attendance at courses, etc.

The extension agent had from four to six practicos working under his supervision. He and the practicos worked mainly through individual contacts and through friendship groups. The most powerful tool used by the extension agents was their role played in the credit system in the sense that supervision by the extension agent was a credit requirement.

Most of the extension agents lived in the area of the extension agency. The practicos lived in the area of their work fronts.
History of Extension

The Extension Service of the Secretariat of Agriculture had its roots in State-Law 25 of April 26, 1929 (21, p. 500). It created the Secretariat of Agriculture and Development which had two sections, agriculture and industry, and public works. The Agricultural Section was in charge of research, teaching, plant protection, agronomic services, etc.

In 1930, State-Law Number 23 created a bounty system for tobacco farmers in Antioquia, according to the recommendations made by the Agronomists working for the Secretariat of Agriculture and Development (35, pp. 5-12).

In 1930 there existed a demonstration station for tobacco at Barbosa and many demonstration fields for wheat, potatoes, rice, and cabuya (sissal-like fiber) conducted by Agronomists. At the Experiment Station, Tulio Ospina, many experimental trials were conducted on many crops.

On June 15, 1944 (18, pp. 43-45) an advisory committee was created by State Law and among its functions were the advising on methods of teaching and the diffusion of new techniques and systems of cropping. This state Law also mentioned research, diffusion agricultural education and extension. In other
words, it established a rudimentary type of agricultural extension service.

On May 23, 1946 (17, pp. 9-11), the Secretariat of Agriculture and Development\(^1\) re-established by State Law Number 3, in order to work for the development of agriculture and livestock and for the general economic development of the rural people. This State Law had a flaw in that it left the organization of the Secretariat to the criteria of Secretaries, who served as administrators in that they were selected on the basis of changing political considerations.

In a 1949 report (31, pp. 8-20) an increase in yields of about 25 per cent was reported as being due to the free distribution of selected corn and bean seeds and the use of demonstration fields which induced farmers to imitate the new systems of cropping.

In 1949 the Secretariat (31, p. 12) defined extension as a system of teaching done in the homes, in the field itself on specific problems of interest to the rural people and the diffusion of new techniques which will be beneficial for man and his crops; therefore helping collective development. Here the influence of Denneth Guthrie, could be observed.

\(^1\)From this point on the term Secretariat will be used to signify the Secretariat of Agriculture and Development of the State of Antioquia.
In 1948 the Secretariat had six Agronomists and two veterinarians. The number of personnel was increased in 1949 to 18 agronomists, 8 veterinarians, 14 practicos and 5 vaccinators who were conducting campaigns on fruits, pastures, extension, cocoa, cotton, rice, tobacco, cassava, etc. (30, pp. 6-20).

In 1950 the Secretariat also had a section called "Ensenanza Rural Agricola y Ganadera" (Rural Teaching in Agriculture and Livestock) and in 1957 the Station-School at Rionegro was training rural youth on agricultural techniques.

The original name of the extension agencies were "Agricultural Sectors", but in 1957 they were changed to "Extension Regional Centers" of which there were twelve that supposedly covered the whole State. In 1959 the state was rearranged into 22 sectors, keeping twelve for the Secretariat, but the Secretariat worked only in nine due to a lack of personnel. The extensionists had a fifteen day training course and began organizing districts in their respective sectors (59, pp. 2-6).

The Secretariat organized in each sector one or two extension districts. In each extension district a practico was located whose responsibility it was to work with all the families included in the district. Each district included around 200 families and an area of 1,000 to 1,500 hectares.
Several socio-economic studies were made in the districts in order to suggest programs and future plans of work.

The Secretariat continued to use the bounties and free distribution of seeds and inputs in order to make an extension service in the "Antioqueña" way, hopefully developing a good perception of itself among its clients (29, pp. 14-15).

The Secretariat was reorganized in May 1969 (58, pp. 3-36). With this reorganization the Regional Centers were again established, along with sub-offices of the Regional Centers and the experimental nucleos. The purpose was to make a better distribution of human and economic resources because the previous work done was in very specific areas and there was need for more integration of activities, as well as the need to diffuse the service to the whole state (58, p. 36). The activities of the Secretariat were grouped in four main programs, agricultural productivity, livestock productivity, extension education and forest resources.

Theoretically, the first two programs, agriculture and livestock productivity, were to be carried out with a service orientation for the clients who had obtained credit from an official institution or who had enough resources to pay for the services. The other two programs had more of an extension education orientation. In August 1971 the four programs were further divided into twelve sub-programs.
In August 1971, the personnel of the Secretariat in the field\(^1\) included: 25 agronomists, one forest engineer, 18 veterinarians, 9 animal husbandmen and 79 practicos and experts. These personnel were located in 31 extension agencies (see Figure 4 and Appendix E). It was interesting to note that all but two of the professionals in the field had been working with the Secretariat for less than five years. In part, this was due to the fact that the Secretariat paid very low salaries before the reorganization of 1969, forcing the professionals to search for better salaries with other organizations, and also because in 1969-1970 the total personnel were more than doubled as a consequence of the new reorganization. In September 1971 the Secretariat was paying a basic salary of $5,165.00 Colombian pesos ($250) per month for a professional-level agronomist that joined the organization. This salary was relatively good.

Alvarez (47, p. 7) in his report of extension activities, stated that the Secretariat on many occasions discontinued programs already studied and in execution, or left a sector forgetting the work and cooperation already obtained from farmers. This seemed to be the case since great variation was found in the report of extension agency localities from year to year.

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\(^1\)Personal information obtained from Orlando Machado, Assistant Director, Operations Division and Julio C. Sanin, Director, Operations Division of the Secretariat of Agriculture.
Figure 4. A map depicting the Secretariat of Agriculture of Antioquia Extension Agencies in Antioquia
Credit Programs

In 1959 the Secretariat of Agriculture began trying to reach an agreement with the Agricultural, Industrial and Mining Credit Bank, and the Coffee Bank to start a program of supervised credit. A contract was signed, finally with the Agricultural, Industrial and Mining Credit Bank on February 11, 1971 by which the Secretariat would provide the technical assistance required by the Bank to make loans to farmers or cattlemen who met all the requirements.

The Secretariat provided this service free of charge and attempted to give priority to small, medium and large farmers, respectively in that order. Unfortunately, this contract has not worked as was expected, due to multiple problems.¹

Personnel Training

In the literature review made, the author did not find much information about training programs for extensionists in the Secretariat. They have sent a few employees on some occasions to different courses in the past. Only in 1969 a series of short courses for extensionists were initiated in cooperation with the

"Servicio Nacional de Aprendizaje"\(^1\), the School of Agriculture at the National University and School of Veterinary Medicine at the Antioquia University (57, p. 28).

The Secretariat has not had training programs for its new extension employees who usually were new graduates. The new employees have generally had informal talks with experienced men about their work, immediately before being sent to the field. There were no descriptions of job functions.

As a result new extensionists have generally been free to do whatever they wanted to do which usually has meant a change in the type of work. In the future, it is hoped that through the work by newly organized sub-programs and projects, a type of continuity can be obtained.

Clientele and Area

The Secretariat clientele and area covered included all farmers in the Municipios of Antioquia (see Figure 4) that did not have an integral technical assistance program from other organizations (58, p. 36).

Extension Agents' Functions

The extension agents have not had a fixed number of practicos under their supervision. The reorganization of the Secretariat

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\(^1\) It is an intermediate level training school fornon-professionals.
set up functions of the regional centers and the experimental nucleos based on coordination, direction and execution of plans covered by its four main programs, as well as coordination with other entities, but the functions of the extension agents were not defined.

The work of the extension agent was based mainly on his interpretation of State Executive Order 431 and from guidelines of the Operations Division.

The extension agents and practicos worked mainly through demonstrations, visits, meetings, etc., with the clients, giving special emphasis to demonstrations. This could be considered their main tool and they were carried out in cooperation with other organizations, such as ICA. Due to budgetary problems and not as a principle, the bounties were very reduced at the time of the reorganization.
Some rudimentary roots of what we know as extension started in the three organizations in the 1920's. They were highly influenced by the teachings of Denneth Guthrie in 1947 and later by the extension personnel brought to the country to organize the "Proyecto Piloto de Extension" in 1952 by the so-called "Servicio Tecnico Agricola Colombo-Americano" (STACA). At this time the concept of the extension agent, home economist, 4-H specialists, etc. were introduced into the country and adopted by the three organizations.

Although the three extension organizations have had as the main objective to educate the farmers in order to increase production and as a logical consequence raise their socio-economic conditions, they have had some similar as well as contrasting aspects. Some that were mentioned in the historical review include:

1) Origin: The coffee growers federation started as a private organization which signed a contract with the Government to provide extension service for coffee growers. The other two organizations were originated in the Government, although at different levels.
2) Political influence: The Coffee Growers Federation has been the organization traditionally which has had more freedom from political influence. The Secretariat has continued to be dependent upon the changing criteria of the Secretaries who are selected on the basis of changing political considerations. ICA's extension service has had a certain amount of freedom because it depends only to some extent upon the Ministry of Agriculture, being a semi-official organization.

3) Extension Agencies: Of the three organizations the extension agencies of Federation have been in one locality longer. The extension agencies at the Secretariat have been moved according to political influences. ICA has had a policy of moving the extension agencies every 3-5 years.

4) Policies: These have been more stable relatively in the Coffee Growers Federation, due to the fact that it has not had very many changes at the administrative level. The Secretary has changed continually in the Secretariat and ICA has been affected by changes.

5) Budget: Although this was not analyzed in the historical review, one can deduct that the Coffee Growers Federation has had less problems with budgets than did the other two organizations. The extension service of ICA since 1968 has had less problems than earlier. The budgetary
problems have had great effect on the stability of the extension agencies and on other important factors, such as salaries for extensionists.

6) Personnel: Personnel policies presented striking differences in several aspects. The most important were:

   a) Training: The Federation has trained its extensionists through short courses. On the other side ICA has had a program of foreign training and the Secretariat has not had any training program.

   b) Stability: The Coffee Federation has had greater personnel stability where one out of nine extensionists has had less than five years of work, compared with the Secretariat where only 2 out of 53 have had more than five years of experience. The stability of ICA's personnel could not be compared because it is a very new agency.

   c) Morale: As a consequence of the differences in budgets, changes in policies, etc., one could deduct that there were differences in personnel morale.

7) Credit: The Federation has always been concerned with the credit aspect as a way to foster development and it has created several funds and signed contracts to work on this problem. The other two organizations were concerned but they have not been able to do much about it.
8) Methodology: This area presented an important variation - friendship groups. Although the three extension organizations have used the traditional techniques of demonstrations, meetings, visits, etc., with debatable results, the Federation developed and has been using the friendship groups with striking effects.

9) Clientele: The Federation's clientele have been specific; especially with the medium and large coffee growers. ICA's clientele have been those farmers in their work fronts who can increase production and productivity and the Secretariat's clientele supposedly have been all of the farmers of Antioquia.

10) Area covered: The area covered also presented some differences. The Federation has worked in areas where coffee was grown and especially where coffee production was heavier. ICA has had very limited coverage area-wise because of the nature of its program while the Secretariat has been trying to cover the entire state with its 31 extension agencies.

11) Bounties: Actually the Federation did not use them. ICA has done so at times in spite of its philosophy of not using them (52, p. 47) while the Secretariat has continued using them, although limited due to budgetary problems.

12) Extensionists functions: These have been described very well by ICA. The Federation used to have descriptions of
functions in the early 1960's, but recently the training and stability of personnel have made it unnecessary. The Secretariat has not had specified job functions for its extensionists.

13) The three extension organizations have had programs of formal training for youth and in home economics. The Federation more recently has left out 4-H-type programs and substituted instead friendship groups and "Club futuros agricultores de Colombia" (Future Farmer-type program).

In this chapter a brief history was presented of the extension services in the three organizations in the study. It showed that a rudimentary type of extension service started in Colombia in the 1920's, but the more modern philosophy of extension as such began after the recommendations of Dr. Guthrie in 1947. After 1952 the concept of the extension agent and the home economist, and 4-H Club assistants were introduced.

Of the three organizations, the Coffee Growers Federation has been the one which showed more continuity and better organization, due primarily to the many facts that were mentioned in the comparison of the three organizations.

The author hopes that this brief history will help the reader to understand the evolution of the three extension organizations, the factors that affected them, and the manner in which the work was done in order to evaluate better the findings of this study.
CHAPTER III

REVIEW OF LITERATURE

This chapter presents a review of literature on perception and the role it plays in individual behavior. The individual's past experiences determine the way he perceives a thing and perception is one of the two components of an attitude.

The chapter also deals with the role that perception plays in individual learning behavior as well as the importance that the client's perception of the extension agent has on client learning of new techniques or ideas.

Behavior and Perception

Psychologists have found that an individual's behavior is a function of his perception of the events to which he is exposed and not a function of the physical stimulus. They have concluded that for a person the important or crucial aspect of behavior is the meaning of events and not the externally observed nature of events (39, pp. 662-673).
A definition of perception was given by Estevan and Estevan (15, p. 117) who defined it as "an awareness or interpretation of a situation (stimuli) in terms of which the individual responds, and which he maintains or modifies in light of his experience".

Weiss (15, p. 117) summarized the thinking of some psychologists and defines perception as "part of the process of living by which each one of us, from his own particular point of view creates for himself the world within, in which one has experiences and through which one strives to gain satisfactions".

Past Experiences and Perception

The definition of perception indicates that perception is personal and originates in the meaning the individual gives to a particular situation based on his life's experiences. As the experiences can be real or imaginary and no two persons can occupy the same position at the same time and place, it is evident that two persons can not have identical experiences or the same perceptions. Since there are individual differences, these will contribute to differences in perception.

The extension service in Antioquia was more than 20 years old. There has been enough time for the farmers, and especially its clients or users, to become familiar with it because as
Cantril (7, p. 164) said, "all ideas of what things are, where they are, what they are good for and so on, are based on . . . assumptions built up from past experience because they have proved good bets for action". If the clients have had bad experiences with the extension agents, we can have what Byrness (38, pp. 242-256) called "learned resistance", due to unfavorable experiences with extension workers, especially when they fail to keep their promises.

The reasons that Foster (5, p. 120) used to explain why people of different cultures often perceive the same phenomenon in a different fashion is that the perception of a thing depends largely on past experiences and past experiences are largely determined by culture. Weiss (15, p. 118) stated, "whatever man knows or thinks he knows he has learned through the experiences of others".

**Attitudes and Perceptions**

Attitudes are acquired through experiences which have a pronounced affective component. Attitudes are learned through imitation more than anything else.

According to Blair, et. al (2, p. 216), attitudes have both perceptual and affective components; attitudes help to determine not only what the individual sees but how he sees it.
When an individual has acquired a negative attitude toward a person, he is ready to respond with those modes of behavior which show dislike or defense. He is often able to notice in that person the slightest gesture or suggestion, while others are unaware of those details. He ascribes motives to that person based on his existing biases or past experiences. As attitudes operate on perception, an individual tends to see what he is looking for and therefore reinforces his attitudes even when there is evidence to the contrary. For these reasons, attitudes are sometimes highly resistant to change.

As attitudes are learned, it is reasonable to assume that people have learned from those in their immediate groups and other contacts. If an individual has learned to distrust extension agents and he undergoes an experience which indicates that extension agents are trying to help him and other media reinforce this idea, his perception of the extension agent could change completely from the one established through association with his close friends. However, if an extension agent is unfriendly and not helpful, this attitude will be reinforced which will then be more difficult to change.
Perception and Learning

When an individual has a problem, he purposefully tries new approaches based on his past experiences. He perceives the effects of those approaches and based on it he will accept or reject them as valid for the solution of his problem.

Frandsen (6, pp. 276-305) states that "perception guides learning". For this reason the extension agent must provide the clients with favorable perceptions of the effects, if the clients are to learn new things.

The extension service's main function is education, mainly to teach farmers or clients new agricultural practices, techniques and ideas. Each one of these embodies concepts which hopefully later on is going to have meaning for the person who learned it. Speaking on concept learning, Klausmeier and Goodwin (10, p. 251) stated that concepts are learned through "meaningful perception learning and purposeful discovery learning".

According to Ausubel (10, p. 84) the critical feature of perceptual learning is that the entire content of what is to be learned is presented to the client (learner) in its final form and the client internalizes it, being able to reproduce it later. The essential condition for meaningful perceptual learning is that the client assimilates new content into his already existing
knowledge so that it has some meaning. The new material is incorporated into the cognitive structure and the individual has learned a new concept.

In human behavior concepts serve two main functions. First, they function as responses to objects and events by which they are categorized and classified. In this case concepts help the individual to deal more effectively with the physical and social environment. Second, they serve as mediators between stimulating events and subsequent behavior. Here concepts help the individual to learn more efficiently (10, p. 219).

Based on what was said, one can deduct that the extensionist's main job is to make the clients (farmers) perceive that the practice or idea being taught is good for them and to make them understand why it is good so that they will understand the meaning of it.

Perception and the Teacher

The extension agent is a teacher. His main function is to teach farmers or clients new practices and ideas, helping them to apply new agricultural techniques on their farms.
Speaking on students and the teacher, Klausmeier and Goodwin (10, p. 202) stated that:

regardless of leadership and behavior of the teacher, he must be perceived by the students as a helpful person in order to make progress towards educational objectives in the cognitive, psychomotor and affective domains. A helpful person is one who considers the problems of students as important and helps them with those problems. A helpful teacher quickly gets group cohesiveness and works constructively, here is when leadership and other desirable attitudes for a productive group emerge.

If the extension agent, while carrying out his function of teaching clients new techniques or ideas, is perceived by the clients (farmers) as a helpful person who is interested in their problems, he probably will be an effective worker in bringing about changes in the cognitive, affective and psychomotor domains of his clients.

Sometimes it is more important for the clients to have a favorable perception of the extension agent than anything else. Niehoff (12, pp. 13-14) stated that the important thing is that an extension agent be accepted by local people as technically competent, regardless of the actual state of his competency. In other words what is important is how the extension agent appears to the clients rather than what he actually may be. Niehoff mentioned further of some cases where highly qualified people have failed to take into consideration the differences in the environment in which people were found and as a consequence
have made technically bad judgements which brought about an unfavorable perception by the recipients. Byrness (38, pp. 242-256) stated that if the resistance to change of the farmers is based on the perceived technical inadequacy of the extension agent, even the most competent extension workers will find resistance to his efforts.

Many times farmers see the extension agent as belonging to a higher stratum of society. This perception can sometimes be due to the fact that the extension agent is unable to adapt to the farmers' environment (52, pp. 54-55). In other cases it may be due to the fact that the extension agent is trying to maintain social distance, keeping himself aloof from the farmer.

Erasmus (4, p. 84) wrote on extension agents who try to maintain social distance saying:

. . . Native agronomists and other trained personnel are often more likely to tell farmers what to do than to get out and show them. In Colombia, I have seen highland Agricultural Extension Agents go into the field in a black double-breasted suit with tie, scarf and black homburg. They were far more eager to demonstrate their social distance from the farmer than to demonstrate improved agricultural practices.
Social distance may explain what Deutschman and Fals Borda (13, pp. 29-30) observed in Saucio, Colombia. Here the farmers adopted what the extension agent told them to do, but once he left the farmers discontinued what they were doing. This type of forced adoption situation, to appear better in front of some one higher, was replaced by the traditional way of doing things when the person had left.

**Perception and Adoption**

The adoption process includes a change process. A farmer must go through a change process if he is to adopt a new practice or technique.

The importance of perception in change has been documented several times in this review. According to Niehoff (12, p. 40) the process of induced socio-cultural change had two basic functions, the action of the extension agent (change agent) and the reaction of the recipients. He said that the reaction of the recipients is based on their attitude and behaviors, depending on the recipients' motivation. Therefore, perception is essential for induced socio-economic change or the adoption of new ideas or practices. Niehoff (12, p. 41) stated that perception is one of the most important forces which impinge on the change process and therefore the recipients' perception of any practical benefit is a sound motivation on which to build a program of change.
Foster (5, pp. 120-142) mentioned several cases in which misperception of roles and faulty communication have been barriers to change. Byrness (38, pp. 242-256) in discussing the so called resistance to change stated that some farmers may resist change, but what they resist more frequently is what they perceive the change to be. He mentioned a study in Philippines where the farmer's perception of the extension agent was that of technical inadequacy. Farmers commented about the extension agent: "We know more than he does. He is young. What does he know?"

**Extension Agent Perception in Colombia**

Only a few studies have been made in Colombia where in a direct or in an indirect way perception was mentioned. One of these studies was made by Agudelo (46, p. 76) who found that for the attitudes towards the extension service of the 50 families studied, 67 per cent of them had attitudes classified as favorable or strongly favorable. He also found that the farmer's knowledge of the extension service personnel was mainly that of private citizens and not as members of the service and that the farmer's knew more about the practices studied from other media than through the extension service.
Correa (50, pp. 16-40), in an evaluation of extension work in Sopetran, found that 19 farmers (76 per cent) had attitudes classed between favorable and strongly favorable.

Maya, et. al. (55, pp. 12-30) in an evaluation study in a district at La Union, Antioquia, found that 12 farmers (37.5 per cent) had strongly favorable attitudes and 12 farmers (37.5 per cent) had unfavorable attitudes toward the extension service.

In this chapter the role that past experiences played on perception was discussed, indicating how perception affects the learning process. It is evident, therefore, that the perception of the extension agent plays an important role in the adoption of new ideas or practices by farmers. Unfortunately, in Colombia, very few studies have been made on perception. This study is focused on defining perceptions of the extension agent and the extension service by the farmer with the hope that more insight into this phenomena will enable extensionists to function more effectively.
CHAPTER IV

RESEARCH DESIGN

This chapter presents the steps followed in the study: objectives and hypotheses, the interview schedule, sampling procedure and data collection. There is also a discussion on the perception scale, its construction and analysis for internal consistency, because the primary purpose of this dissertation was to analyze the various perceptions that clients of the extension service organizations in Antioquia, Colombia, have of the organizations and of the extension agents.

Also included is a discussion of the comparative rating scales which were designed and a discussion of the other variables included in the study.

Objective and Hypotheses

The main objective of this study was to determine the clients' perceptions of the extension services and of the extension agents who represent the agricultural extension organizations. The perception of these clients was associated to other selected independent variables, testing the following null hypotheses:
1. There is no relationship between the degree of favorableness of the clients' perception of the extension agent and their level of schooling.

2. There is no relationship between the degree of favorableness of clients' perception of the extension agent and their age.

3. There is no relationship between the degree of favorableness of the clients' perception of the extension agent and their economic status.

4. There is no relationship between the degree of favorableness of the clients' perception of the extension agent and the number of practices learned from extension agents.

5. There is no relationship between the degree of favorableness of the clients' perception of the extension agent and the number of improved practices used on their farms.

6. There is no relationship between the degree of favorableness of the clients' perception of the extension agent and their knowledge of agricultural concepts.
7. There is no relationship between the degree of favorableness of the clients' perception of the extension agent and their exposure to mass media.

8. There is no relationship between the degree of favorableness of the clients' perception of the extension agent and their extent of contact with extension personnel.

The Interview Schedule

The research instrument used was the personal interview schedule. This interview schedule was first developed in English and then translated into Spanish. After translation exploratory interviews with six farmers were done. Based on this experience, a revision of the questionnaire was made. A second pre-test was made at the Municipio of Penol where 17 persons were interviewed.

The interview schedule was divided into two main parts (see Appendix A). One dealt with the perception scale to be discussed later and the other part included personal aspects and general information to be used as variables. Among these personal aspects and general information were the following:
1) personal characteristics - age, schooling, family size;
2) economic situation; 3) knowledge of agricultural concepts and the extension service; 4) levels of contact with extension workers; 5) desire to improve yields and use of improved practices; 6) use of credit; and 7) mass media exposure.
**Sampling**

The sampling procedure used for this study was a combination of probability and non-probability sampling (14, pp. 535-545). As this was a study of the three main organizations that have a type of agricultural extension service, it was decided to interview around 140 clients of each organization, although the number of extension agencies and the total number of clients for each agency was different.

In Antioquia ICA had three extension agencies. For the study all three were used. Two of the agencies had five fronts and the other had four.

Three fronts were drawn at random for each agency. From the list of farmers (clients) registered in each front, 136 were selected at random. The number of clients registered and interviewed in each work front are shown in Appendix B.

The Coffee Federation had eight extension agencies called "Seccionales" in Antioquia (see Appendix C). For the study three seccionales were chosen at random. Since each Seccional had 4 to 6 work fronts, three fronts for each of the three agencies were chosen at random (see Appendix D). From the list of clients registered in each front, a random sample of 127 clients was taken. For ICA, the number of clients in each work front were variable.
The Secretariat of Agriculture had 31 extension agencies that included eight regional centers, fifteen sub-offices of regional centers and eight experimental nucleos (see Appendix E). Since a reorganization had recently been made and in order to get more reliable information, the study considered only agencies established in the same locality for two or more years. Only thirteen of the 31 extension agencies met this requirement. Ten out of the thirteen agencies provided lists of clients (see Appendix F). From each list, a random sample was selected and a total of 107 interviews were made.

Data Collection

Data were collected by personal interview schedule. Most of the interviews were made by students of the School of Agriculture of the National University at Medellin. The author also made some of the interviews which were made during the months of August and September of 1971. The students were in their fourth year at the University. The interviewers were trained by the author and they became thoroughly acquainted with the schedule through practice interviews which were made under the supervision of the author.

1The selection was made with Dr. Orlando Machado, Assistant Director, Operations Division, Secretariat of Agriculture.
Some respondents were not interviewed on their farms due to various reasons such as distance, place of work, etc. This problem was solved in part by interviewing them at the village or town on Saturdays and Sundays when they usually came to the village.

ICA had very up to date lists of clients for each work front, but even so a few of its clients could not be located. The Coffee Federation had some lists which were two or three years old. It was almost impossible to locate a few clients due to the political situation and because some were afraid to give information. Other Coffee Federation lists were up to date, and they only included clients who were under supervised credit programs or were being given specific technical assistance.

The Secretariat of Agriculture extensionists did not have lists of clients in spite of the fact that the reports showed a large number of clients attended. For the study the lists of clients finally obtained were due to a request made by the Director and the Assistant Director of the Operations Division of the Secretariat and on one occasion the Sub-Secretary also requested them. The lists obtained were very small, compared with the lists of the other organizations. Many clients could not be located. For example in Rionegro, a client had been dead for a year and a half. In "La Union", the list repeated the
same clients two or three times. In Puerto Berrio, most of the clients selected lived in Medellín. Some lists included clients who did not live in the area.

Once the interviewers had the list of clients to interview they went to the work front to locate them. If the clients lived in Medellín, they were ineligible for interview; otherwise they were interviewed. Some of them lived in a town, but the towns were so rural that they were considered eligible for the study. Many clients on the Secretariat of Agriculture lists were living in towns.

Some facts must be explained in order to give proportion to the significance and validity of the information collected. In Colombia and especially in Antioquia, most of the farms were not measured and the owners could only give approximate information about its size. The only farms which probably were measured were the large ones and in these cases the owners were afraid to tell the truth. The indirect method of measuring income of farmers by asking them how much they spent last week in groceries was considered by the author to be one of the best measures because farmers could remember exactly how much they spent. Farmers also consumed many products from their farms whose value for them was unappreciated. The only problem was that some farmers tried to inflate a little
their weekly expenses in order to appear better in front of the interviewer. In most of the cases the interviewers developed good rapport, except in such cases as Puerto Berrio where the social situation was very bad and people were afraid of kidnappers.

In summary a few were suspicious or reluctant to answer the questions. They were sometimes confused by the statements on the scale, but the interviewers were able to help the respondents answer properly with the help of prepared cards.

The Perception Scale

Perception was the main dependent variable of the study. A scale was developed to measure perception. The scale was divided into two parts: 1) perception of the extension agent and 2) perception of the extension service. A summated rating scale was used; a Likert-type scale (14, pp. 366-368). The scale had 20 items, ten for each aspect, and each item had five possible answers. The five possible answers were strongly agree, agree, undecided, disagree and strongly disagree.

In placing score values, the most favorable response received a score of five, while the least favorable received a score of one. In this form the data collected was transformed from qualitative to quantitative expressions.
Item Selection: The statements used to make the perception scale were developed, based on some ideas taken from the writings of different authors, especially Byrness (38, pp. 242-256), Nischoff (12, pp. 10-41) and some were derived from talks with Colombian extensionists or experienced men and from personal experience. Originally the statements were arranged, trying to maintain a careful balance between positive and negative statements.

The exploratory interviews were very helpful in checking understanding of the items by the respondents. Some idea was gained of the distribution patterns of the responses on the statements. Through the exploratory interviews, all the items were revised and with the help of Dr. Jaime Gutierrez, the scale was revised, reworking some statements, eliminating others and adding some new ones. This resulted in a revised perception scale of 27 statements; 15 for the extension agent and 12 for the extension service. This revised scale was subjected to a second pre-test which was made in the Municipio of Peñol.

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1Dr. Jaime Gutierrez was a temporary associate member of the graduate faculty of L.S.U. and was Director of the Social Sciences Department of ICA.
Internal Consistency of the Scale: In order to evaluate the reliability of the perception scale and to find variation in total scores due to inconsistencies an assessment of the internal consistency of the scale was made. The inconsistencies originated because persons with low total scores scored as high or higher on some given items than persons who had high total scores. To eliminate such inconsistent items, the author made an item analysis of the responses from the 17 interviews made at Penol by the method "Comparison of Extreme Quartiles" (9, pp. 325-326), attempting to establish those items that discriminated differences in perception scores. In that way it was found that 6 out of 15 statements on extension agent perception were found to be significant at 5 per cent level and 5 out of 12 statements on extension service perception were found to be significant at the 5 per cent level. Eleven statements, six for the agent and five for the farmer, exhibited consistent discrimination effects, but the final scale was made with twenty. The remaining seven were discarded.

Classification of the Independent Variables

Some of the independent variables used in this study were defined by groups formed on the basis of comparative rating scales (14, pp. 349-350) made with some indicator of that variable, such as the economic status of the clients. In this way the clients could be placed on a scale, according to their
answers to those indicators. Other independent variables were used alone in order to reject or fail to reject the null hypotheses.

**Economic Status**

The economic status of clients was measured based on values (weights) assigned to the types of answers given to selected questions. The answers to the questions were quantified in the following manner:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Assigned Weight</th>
<th>Type of Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>2</td>
<td>Client owns his home.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Client rents his home.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Client has other home situation.</td>
</tr>
<tr>
<td>Land Tenure</td>
<td>3</td>
<td>Owns land.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Rents land.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Other circumstances.</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Sharecrops.</td>
</tr>
<tr>
<td>Amount of Land</td>
<td>0</td>
<td>Client controls less than 3 hectares.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Client controls from 3-4.9 hectares.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Client controls from 5-9.9 hectares.</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Assigned Weight</td>
<td>Type of Answer</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Amount of Land</td>
<td>3</td>
<td>Client controls from 10-19.9 hectares.</td>
</tr>
<tr>
<td>(contd)</td>
<td>4</td>
<td>Client controls from 20-39.9 hectares.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Client controls from 40-99.9 hectares.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Client controls over 100 hectares.</td>
</tr>
<tr>
<td>Grocery Expenses</td>
<td>0</td>
<td>Client expends up to $100.00 in groceries weekly.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Client expends from $101-200 in groceries weekly.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Client expends from $201-300 in groceries weekly.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Client expends from $301-400 in groceries weekly.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Client expends over $400.00 in groceries weekly.</td>
</tr>
</tbody>
</table>

The sum of the relative weight of the four characteristics (home, land tenure, amount of land and expenses for groceries) yielded a total farming economic status score for each client. The range of possible scores was from zero to seventeen.
Knowledge of Agricultural Concepts

The farmers were asked about several basic agricultural concepts. In the analysis of these responses the work of Aguirre (1, pp. 156-162) was used since he described social events and their interactions which required a special criteria to make use of them. He suggested that they could be differentiated according to levels of abstraction included in conceptual building. He mentioned five characteristics: form, content, use, function, and meaning. Agudelo (36, pp. 83-90) used this approach to evaluate practice adoption in a Colombian neighborhood.

These five characteristics can be applied to the analysis of concept understanding by this description:

Form: The lowest level of analysis that actually exists; reality in the sense that it is known by the name, or the way it is presented; the shape or form of the real thing.

Content: Content stresses the idea and what it is made of; the elements or parts which are included in the final form.

Use: The way the concept operates; legal, technical or ritual operation to obtain a practical end. Use in the operation of things; what they are used for.
Function: The ends to which the operation is directed; the objective or goal to be reached with its use.

Meaning: Meaning denotes the quality attached to the concept; valuing it. It is considered important in relation to on-going events; its relationship to other things.

Based on this framework, weights were assigned to responses as follows:

<table>
<thead>
<tr>
<th>Weight</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Don't apply or wrong idea.</td>
</tr>
<tr>
<td>1</td>
<td>Don't know.</td>
</tr>
<tr>
<td>2</td>
<td>Form.</td>
</tr>
<tr>
<td>3</td>
<td>Content.</td>
</tr>
<tr>
<td>4</td>
<td>Use.</td>
</tr>
<tr>
<td>5</td>
<td>Functions.</td>
</tr>
<tr>
<td>6</td>
<td>Meaning.</td>
</tr>
</tbody>
</table>

The study included these three questions:

a) What do you understand by fertilizers or chemical compost?

b) What do you understand by vaccines?

c) What do you understand by improved seed?

From these three questions, a comparative rating scale was developed by summatng the weights to each answer and obtaining a scale, ranging from zero to eighteen.
Contact with Extension Agents

There were several questions aimed at determining the number of times the client has been in contact with the extension agent during the months of June and July through several selected media.

The following were the different types of media by which the extent of contact was measured.

Method of Contact

Extension agent visited client on his farm by client request.

Client visited extension agent office.

Extension agent visited client on his farm, but not at the request of the client.

Client attend meeting or field days with the extension agent.

Client talks with extension agent anywhere (other than farm and office).

The summation of number of times contact was made with the extension by the client was used to determine contact score, assigning one point for each contact as listed above.

Mass Media Exposure

The clients exposure to mass media was measured using the following questions:

a. Do you have a radio?

b. Do you listen to any programs about farming?

c. Have you read any newspapers in the last four weeks?
d. With what frequency do you go to town?

e. Have you been to Medellin?

f. When was the last time you went to Medellin?

The answers to these questions were categorized and each category assigned a value to form a comparative rating scale. The values assigned to the categories were:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Assigned Weight</th>
<th>Type of Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>0</td>
<td>Client does not have radio</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Client has radio</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Client listens to at least one agricultural program.</td>
</tr>
<tr>
<td>Newspaper</td>
<td>0</td>
<td>Client does not read newspaper.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Client reads at least one type of newspaper.</td>
</tr>
<tr>
<td>Visit town</td>
<td>0</td>
<td>Client goes to town every 15 days or less.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Client goes to town at least once a week.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Client lives in town or visits twice a week or more often.</td>
</tr>
<tr>
<td>Visit Medellin</td>
<td>0</td>
<td>Client has not been to Medellin.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Client went to Medellin more than a year ago.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Client went to Medellin more than 15 days ago, but less than a year.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Client went to Medellin in the last 15 days.</td>
</tr>
</tbody>
</table>
The sum of these four categories (radio, newspaper, visit nearby town and visit to Medellin) yielded a clients' total score for exposition to mass media. The comparative rating scale placed the clients in a scale that went from zero to eight.

Other Variables: As perception was not studied in the abstract but was linked or associated to specific forms of behavior or knowledge of psychological objects, the study also included measures of the following variables:

1) Knowledge of the extension service.
2) Knowledge of the three extension organizations.
3) Number of practices learned from the extension agent and the practicos.
4) Effect of the practices adopted on the farm.
5) Use of credit for the farm and for the buying of groceries.

Method of Analysis

Once the data was collected, it was converted into a numerical system by a code system. Since the data included discrete and continuous variables, parametric and non-parametric statistical tests were used in the study.

The non-parametric tests used were Chi ($X^2$) square and the Kruskal-Wallis (H) one-way analysis of variance test. They were used to determine if the frequencies of the samples in discrete
categories came from the same population. The H value was used when the observations could be ranked because this test employs more of the information about the observations by converting it to ranks.

The parametric tests used were: analyses of variance (F test) to analyze differences among the organizations with relation to certain variables, and the correlation coefficient was used to determine the association of perception with certain variables in order to reject or fail to reject the null hypotheses.

The .05 level of significance was used to reject the hypotheses and to determine significant differences among the organizations.
CHAPTER V

ANALYSIS AND INTERPRETATION OF DATA

As indicated earlier in Chapter IV, the main objectives of this study were to make comparisons among the three extension organizations in relation to the clients (farmers) perception of the organizations and of the extension agent who represented these organizations. Certain null hypotheses in relation to perception were tested.

The findings are organized in this chapter under two main subheadings: 1. A comparison of the three extension organizations in relation to selected variables, using discrete data and non-parametric statistical methods for analyses purposes and 2. Clients perception and findings pertaining to the hypotheses, using parametric statistical methods.

Comparison of the Three Extension Organizations

The comparison of the three extension organizations was carried out through a series of discrete variables which showed certain characteristics of the respondents. In other words, they gave an idea of the organizations' clientele and the impact of the organizations on the respondents which helps in the evaluation of the the results of the clients perception
and the rejection or failure to reject the null hypotheses.

**Principal Occupation**

One question in the interview was designed to determine the principal occupation of the respondents. The responses given by the respondents were grouped into three categories: (1) Principal occupation was farming; (2) Worked as a hired-hand in agriculture; and (3) Non-farming, the non-farming category included those whose principal occupation was not farming. For example, many of those who owned large farms, spent most of their time in other occupations such as, medicine, employees in town, merchants, etc.

The data with regard to principal occupation is presented in Table I. The results of the statistical analysis by Chi-square yielded an $X^2$ value of 49.293 which indicated that there was a significant difference among the respondents of the organizations in relation to the respondents' principal occupation at the .01 level of significance with four degrees of freedom. The information in Table I indicates that most of the respondents of the organizations had farming as a principal occupation. In fact, 55, 77, and 69 per cent of the respondents of ICA, the Federation and the Secretariat, respectively, had farming as the principal occupation, and 12, 16 and 25 per cent of the ICA, Federation and Secretariat respondents, respectively had as a principal occupation, non-farming. This means that in
<table>
<thead>
<tr>
<th>Principal Occupation</th>
<th>Percentage by Organization</th>
<th>( X^2 )</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming</td>
<td>ICA N=136 77 69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Federation N=127 77 69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secretariat N=107 77 69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hired-hand</td>
<td>33 7 6 49.293 .01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-farming</td>
<td>12 16 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>100 100 100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
spite of the supposition that they worked with rural people, these organizations were working a great deal with non-farmers, especially the Secretariat.

**Place of Residence**

The data with relation to place of residence of the respondents is presented in Table II. The results of the statistical analysis by the Chi-square test yielded a $X^2$ value of 19.324 which indicated that a significant difference was found among the respondents of the organizations in relation to their place of residence at the .01 level of significance with two degrees of freedom. In fact 40 per cent of respondents of the Secretariat lived in urban areas, while 20 per cent of those of the Federation and none of ICA's did. When compared with the data in Table I, a similar pattern is apparent. The Secretariat worked with more persons whose principal occupation was non-farming and who lived in urban areas.

**Size of Families**

One question in the interview schedule was designed to determine the number of persons who were living with the respondent at the time of the interview. The data is presented in Table III, and the results of the statistical analysis by
### TABLE II

**COMPARISON OF THE RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY THEIR PLACE OF RESIDENCE, ANTIOQUIA, COLOMBIA, 1971**

<table>
<thead>
<tr>
<th>Place of Residence</th>
<th>ICA Federation</th>
<th>Secretariat</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=136 N=127 N=107</td>
<td>X² P</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>0 20 40</td>
<td>40</td>
</tr>
<tr>
<td>Rural</td>
<td>100 80 60</td>
<td>19.324 .01</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100 100 100</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE III

**COMPARISON OF THE RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY THE NUMBER OF PERSONS WHO LIVED IN THE SAME HOUSE, ANTIOQUIA, COLOMBIA, 1971**

<table>
<thead>
<tr>
<th>Number of Persons</th>
<th>ICA Federation</th>
<th>Secretariat</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=136 N=127 N=107</td>
<td>X² P</td>
<td></td>
</tr>
<tr>
<td>1 - 4</td>
<td>21 29 25</td>
<td>25</td>
</tr>
<tr>
<td>5 - 6</td>
<td>23 14 29</td>
<td>29</td>
</tr>
<tr>
<td>7 - 8</td>
<td>24 21 15</td>
<td>15</td>
</tr>
<tr>
<td>9 -10</td>
<td>17 20 17</td>
<td>11.520 N.S.</td>
</tr>
<tr>
<td>11-12</td>
<td>11 10 10</td>
<td>10</td>
</tr>
<tr>
<td>13-22</td>
<td>4 6 4</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100 100 100</td>
<td></td>
</tr>
</tbody>
</table>
by the Chi-square test yielded an $X^2$ value of 11.520 which indicated that there was no significant difference among the respondents of the organizations with relation to the number of persons living with the respondent at the .05 level of significance with 10 degrees of freedom.

Although there was no significant difference among the respondents of the organizations, it can be observed that there were high numbers of respondents with very large numbers of dependents which in turn affected the risk that the respondents could afford to take in their work or by the adoption of new practices taught by the Extension personnel. The average number of dependents for each respondent was slightly over six persons.

**Type of Family**

In ascertaining the respondents family type they were asked to state the relationship with the persons who were living with them at the time of the interview. Based on that information the respondents were classified into two groups: (1) nuclear family and (2) extended family. The criteria used for this classification were: (1) nuclear family indicated that the respondent lived only with his wife and/or children, and (2) extended family indicated that the respondent had other persons living with him besides his wife and/or children such as
parents and in-laws. Data on family type is presented in Table IV. The results of the statistical analysis by the Chi-square test yielded a $X^2$ value of 5.920 which indicated that no significant difference existed among the respondents at the .05 level of significance with two degrees of freedom.

The information shows that there was a high percentage (about three-fourths) of nuclear families, contrary to the widespread belief that there was a large number of extended families in Antioquia, Colombia.

**Extrinsic Motivation**

Extrinsic motivation was used to denote a recognition on the part of the respondents of the need to increase the yields of their crops. The respondents were asked to state if they had done something to increase the yields of their crops. It was expected that a result of almost a hundred percent would be found, but as the data in Table V indicates, this was not the case.

The results of the statistical analysis by the Chi-square test yielded a $X^2$ value of 14.525 which indicated that there was a significant difference among the respondents in relation to extrinsic motivation at the .01 level of significance with two degrees of freedom. In fact 16, 2 and 15 per cent, respectively, of the respondents from ICA, the Federation and the Secretariat explicitly recognized that they had done nothing to increase the yields of their crops. Substantial percentages, however,
### TABLE IV

**COMPARISON OF THE RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY THEIR FAMILY TYPE, ANTIOQUIA, COLOMBIA, 1971**

<table>
<thead>
<tr>
<th>Family Type</th>
<th>ICA Federation</th>
<th>Secretariat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>67</td>
<td>72</td>
</tr>
<tr>
<td>Extended</td>
<td>33</td>
<td>28</td>
</tr>
</tbody>
</table>

\[X^2 = 5.920, \text{ N.S.}\]

**TOTAL**

100          100          100

### TABLE V

**COMPARISON OF THE RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY ACTIONS TAKEN BY THE RESPONDENTS TO INCREASE YIELDS, ANTIOQUIA, COLOMBIA, 1971**

<table>
<thead>
<tr>
<th>Action Taken</th>
<th>ICA Federation</th>
<th>Secretariat</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Something</td>
<td>84</td>
<td>98</td>
</tr>
</tbody>
</table>

\[X^2 = 14.525, \quad .01\]

**TOTAL**

100          100          100
indicated that they had done so with almost all of the respondents from the Federation (98 per cent) indicating that something was done.

**General Knowledge About the Extension Services**

This section is concerned with determining the extent of the respondents' knowledge about the extension services. In the interview the respondents were asked to state their understanding of extension work. Based on this information, the respondents were classified into four groups: (1) **wrong idea** or did not apply as when a respondent said, "it is a plot of land that is fertilized and it is planted over and over "or" it is credit but this year it was only demogoguery"; (2) **did not know**; (3) **fair knowledge**, as when a respondent answered, "it is what the practico does," or that "he knew members of ICA"; and (4) **good knowledge** as when the respondent answered, "it is to free people from ignorance" or "to teach new agricultural knowledge."

The data is presented in Table VI and a statistical analysis using an analysis of variance test yielded an H value of 67.046, indicating that there was a significant difference among the responses of the respondents at the .01 level of significance with two degrees of freedom. Consequently, the results of this analysis indicated a significant difference existed between the level of knowledge about extension work and the organization with which the respondent was a client.
### TABLE VI

**COMPARISON OF THE RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY THEIR GENERAL KNOWLEDGE ABOUT EXTENSION AND THEIR SPECIFIC KNOWLEDGE ABOUT EXTENSION ORGANIZATIONS,**

**ANTIOQUIA, COLOMBIA, 1971**

<table>
<thead>
<tr>
<th>Knowledge about Extension</th>
<th>Percentage by Organization</th>
<th>ICA N=136</th>
<th>Federation N=127</th>
<th>Secretariat N=107</th>
<th>H*</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension in General</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong</td>
<td></td>
<td>16</td>
<td>6</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td>66</td>
<td>36</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>13</td>
<td>27</td>
<td>36</td>
<td>67.04</td>
<td>.01</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>5</td>
<td>31</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td>29</td>
<td>85</td>
<td>66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>64</td>
<td>11</td>
<td>24</td>
<td>74.85</td>
<td>.01</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>7</td>
<td>4</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td>74</td>
<td>6</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>19</td>
<td>40</td>
<td>29</td>
<td>138.19</td>
<td>.01</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>7</td>
<td>54</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secretariat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td>76</td>
<td>53</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td>22</td>
<td>31</td>
<td>51</td>
<td>102.28</td>
<td>.01</td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td>2</td>
<td>16</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*H. value obtained through the Kruskal-Wallis one-way analysis of variance test.*
The data in Table VI indicated that a high percentage of Federation and Secretariat respondents had fair to good knowledge about extension work, while the largest percentage among ICA respondents exhibited no knowledge or had the wrong idea. In fact, 31 per cent of the Federation and the Secretariat respondents had good knowledge of extension work, while only 5 per cent of the ICA respondents did. The information also showed that a high percentage of respondents from ICA (66 per cent), the Federation (36 per cent) and the Secretariat (28 per cent) did not know much about Extension work.

Knowledge of the Extension Organizations

This section is concerned with specific knowledge of the three extension organizations. In the interview the respondents were asked to state what they knew about the functions of ICA, the Federation and the Secretariat. The respondents answers were classified into three groups: (1) did not know, (2) fair knowledge, and (3) good knowledge.

The data was statistically analyzed for each organization by the Kruskal-Wallis one-way analysis of variance test and it yielded H values for each organization which showed significant differences at the .01 level of significance among the three respondents groups with respect to all three of the organizations.
Consequently, the results of this analysis indicated the presence of a definite association between the organization's respondents and their knowledge about the Extension organizations.

The data in Table VI indicates that the respondents for a particular organization had higher levels of knowledge about the organization of which they were clients than did the respondents of the other organizations. Except for the Federation which had 54 per cent of its respondents at the good level of knowledge, the largest percentage of respondents were placed at the fair level of knowledge. Therefore, it is evident that the organizations need to be sold more to their clients by informing them what they can do that can help them.

Sources for Advice

This section is concerned with determining sources for advice of the respondents when they had a problem. In the interview each respondent was asked to indicate whom he would go to for advice when he had a problem with his crops or animals. The respondents' answers were classified into four groups: (1) no one, (2) friends, (3) professionals, and (4) extension personnel.

In the case where a respondent answered friends or an extension agent, he was placed in the fourth group, i.e. the one who requests advice from extension personnel.
In the case of crops, there was a tendency for all respondents to go to the extension agent for advice. The Federation's respondents were the ones who requested advice more frequently from extension personnel (86 per cent), followed by the Secretariat's respondents (62 per cent) and by ICA's respondents (46 per cent). The information also indicated that a relatively high percentage of respondents from ICA (39 per cent) and from the Secretariat (25 per cent) did not request advice from anyone, while only a small percentage of the Federation's respondents (8 per cent) answered likewise.

In cases of problems with livestock, a different pattern of requests for advice was followed. Here the results were more varied. The highest percentage for ICA called on Extension personnel (38 per cent), for the Federation friends were most called (51 per cent), and for the Secretariat Extension personnel (44 per cent) were the major source. Therefore, it was evident from the data that a high number of the clients of the organizations did not seek advice from Extension personnel. This finding would certainly have great importance for Extension work in Colombia because if those who are considered clients of the organization do not seek advice from Extension personnel what happens to the other 95 per cent of Antioquia's rural families who are not clients of Extension organizations?
TABLE VII
COMPARISON OF RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY SOURCES FOR ADVICE ON PROBLEMS, ANTIOQUIA, COLOMBIA, 1971

<table>
<thead>
<tr>
<th>Sources of Advice</th>
<th>Percentage by Organization</th>
<th>ICA N=136</th>
<th>Federation N=127</th>
<th>Secretariat N=107</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No one</td>
<td></td>
<td>39</td>
<td>8</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td>11</td>
<td>4</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionals</td>
<td></td>
<td>4</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ext. Personnel</td>
<td></td>
<td>46</td>
<td>86</td>
<td>62</td>
<td>48.33</td>
<td>.01</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Livestock</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No one</td>
<td></td>
<td>22</td>
<td>18</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td>18</td>
<td>51</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionals</td>
<td></td>
<td>22</td>
<td>18</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ext. Personnel</td>
<td></td>
<td>38</td>
<td>13</td>
<td>44</td>
<td>63.55</td>
<td>.01</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Effects of Practices Adopted

As there is no person more qualified to classify the effects of a new practice than the adopter himself, the respondents were asked to classify the effects of the new practices adopted on their farms. This data is presented in Table VIII and the results of the statistical analysis by the Chi-square test yielded a $X^2$ value of 62.72 which indicated that there was a significant difference among the respondents of the organizations in relation to their classification of the effects of the practices at the .01 level of significance with ten degrees of freedom. Therefore, it could be concluded from the results of this analysis that there was an association between the respondents' classification of the effects of practices and the organization of which they were clients.

Although most of the respondents said that the practices had increased yields, there was a sizable number who had not adopted any practice. This percentage was larger for ICA (45 per cent), followed by the Secretariat (25 per cent) and the Federation respondents (10 per cent).

Some selected reasons given by non-adopters of ICA were: "had not learned anything", "lack of interest and confidence, believed that everything was a lie", "did not have the economic resources", "did not have any place to plant", " and lack of time and the farm was not his own".
TABLE VIII


<table>
<thead>
<tr>
<th>Classification</th>
<th>Percentage by Organization</th>
<th>ICA (N=136)</th>
<th>Federation (N=127)</th>
<th>Secretariat (N=107)</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Adoption</td>
<td></td>
<td>45</td>
<td>10</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased Yields</td>
<td></td>
<td>48</td>
<td>69</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Effects</td>
<td></td>
<td>5</td>
<td>2</td>
<td></td>
<td>4</td>
<td>66.720</td>
</tr>
<tr>
<td>Don't Know</td>
<td></td>
<td>2</td>
<td>19</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Some selected reasons given by non-adopters of the Federation were: "fertilizers were too expensive and it was too difficult to take them to the farm" and "lack of resources".

Some selected reasons given by non-adopters of the Secretariat were: "knew more than they did", "had not learned very well", "did not like to do it", "did not have good breeds which were the ones that should be vaccinated", "it was too troublesome and not necessary", "it was too difficult to find", and "it was too expensive".

Relationship of Practices Learned with Sources of Income

The practices which the respondents learned from Extension personnel were related to the main and secondary sources of income by comparing the practices the respondents said were learned from Extension personnel with what they said were the main and secondary sources of income. Based on this relationship, the respondents were classified into five groups: (1) all practices learned related to main source of income, (2) at least one practice learned related to main source of income, (3) practices learned related to secondary sources of income, (4) practices learned not related to secondary sources of income, and (5) no practices learned at all.
The data is presented in Table IX and the results of the statistical analysis by the Chi-square test yields a $X^2$ value of 174.818 which indicated that there was a significant difference among the respondents in relation to the relationship between the practices learned and the sources of income at the .01 level of significance with eight degrees of freedom. Therefore, it was evident from the data that a definite association existed between the relationship of practices learned-sources of income with the respondents' organizational affiliation. In fact, 64 per cent of the Federation respondents reported all practices learned were related to the main source of income, while there was only two per cent for ICA and 21 per cent for the Secretariat giving the same response. The information in Table IX also reveals a high percentage of respondents who learned practices not even related to secondary sources of income, especially for ICA (29 per cent) and for the Secretariat (20 per cent). The Federation only had two per cent in this category. This finding would certainly have great importance for Extension's work in Colombia because the teaching of practices was not focused on the considerations most important for the clients.
TABLE IX

COMPARISON OF THE RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY THEIR
RELATIONSHIP BETWEEN PRACTICES LEARNED WITH THEIR MAIN AND SECONDARY
SOURCES OF INCOME, ANTIOQUIA, COLOMBIA, 1971

<table>
<thead>
<tr>
<th>Relationship of Practices to Sources of Income</th>
<th>Percentage by Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICA (N=136)</td>
</tr>
<tr>
<td>All related to main source</td>
<td>2</td>
</tr>
<tr>
<td>One or more related to main source</td>
<td>22</td>
</tr>
<tr>
<td>One or more related to secondary sources</td>
<td>11</td>
</tr>
<tr>
<td>None related to any source</td>
<td>29</td>
</tr>
<tr>
<td>No practices learned</td>
<td>36</td>
</tr>
</tbody>
</table>
Use of Credit

In ascertaining the use of credit, or better said, the debt pattern of the respondents in accordance with their respective organizations, the respondents were asked to indicate to whom they owed money. Based on this information, the respondents were classified into four groups: (1) owed money to no one, (2) owed money to relatives and/or friends, (3) owed money to official agencies only, and (4) owed money to official agencies and someone else.

The data is presented in Table X and the results of the statistical analysis by the Chi-square test yielded a $X^2$ value of 33.721 which indicated that there was a significant difference among the respondents of the organizations in relation to their debt patterns at the .01 level of significance with six degrees of freedom. The data indicated that a higher percentage of Federation respondents (77 per cent) owed money to official agencies than did the respondents of ICA (37 per cent) and the respondents of the Secretariat (61 per cent).

The respondents were also asked if they thought that they needed credit for the operation of the farm. This information was statistically analyzed by the Chi-square test and it yielded a $X^2$ value of 5.64 which indicated that no significant difference existed at the .05 level of significance with two degrees of freedom. These results indicated that the perceived need of
<table>
<thead>
<tr>
<th>Credit Usage and Need</th>
<th>Percentage by Organization</th>
<th></th>
<th></th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICA (N=136)</td>
<td>Federation (N=127)</td>
<td>Secretariat (N=107)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Debts Owed to</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No One</td>
<td>23</td>
<td>14</td>
<td>21</td>
<td>21</td>
<td>.01</td>
</tr>
<tr>
<td>Relatives &amp; Friends</td>
<td>40</td>
<td>19</td>
<td>18</td>
<td>33.72</td>
<td>.01</td>
</tr>
<tr>
<td>Official Agency</td>
<td>16</td>
<td>41</td>
<td>36</td>
<td>33.72</td>
<td>.01</td>
</tr>
<tr>
<td>Official Agency &amp; Friends</td>
<td>21</td>
<td>26</td>
<td>25</td>
<td>5.42</td>
<td>N.S.</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Need for Credit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>16</td>
<td>16</td>
<td>5.64</td>
<td>N.S.</td>
</tr>
<tr>
<td>Yes</td>
<td>93</td>
<td>84</td>
<td>84</td>
<td>5.64</td>
<td>N.S.</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grocery Purchases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td>16</td>
<td>21</td>
<td>16</td>
<td>5.42</td>
<td>N.S.</td>
</tr>
<tr>
<td>Both</td>
<td>29</td>
<td>38</td>
<td>36</td>
<td>5.42</td>
<td>N.S.</td>
</tr>
<tr>
<td>Cash</td>
<td>55</td>
<td>41</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
credit was similar for the respondents of all the organizations, and this perceived need was very high, ranging from 84 to 93 per cent of the respondent groups.

The respondents who did not owe money to an official agency, but considered that they needed credit for the operation of the farm, were asked "why don't you go to an official agency and get some money?" Some selected answers given by ICA respondents were: "was afraid", "did not have property deeds for the farm", "did not have anything to deposit as collateral", "all they do is get you enthusiastic", "did not know how to pay it back", "did not have properties and cosigners required by them", and "did not know how to go to them".

Some selected answers given by Federation respondents were: "there are too many problems and there is little free time", "he once had one but he did not like it" and "afraid of losing his farm".

Some selected answers given by Secretariat respondents were: "they were too slow in loaning money", "they loaned money to those who had it and there were too many requirements" and "they had too many requirements and finally they said that there is no money".
Since the manner of paying for groceries indicated the use of credit, the respondents were asked to indicate how they paid for the groceries they bought. Based on this information, the respondents were classified into three groups: (1) those who bought on cash, (2) those who used both cash and credit, and (3) those who bought on credit. The data is presented in Table X and the statistical analysis by the Chi-square test yielded a $\chi^2$ value of 5.428 which indicated that there was no significant difference among the respondents of the organizations in relation to the manner of paying for groceries. Consequently, the respondents of the organizations were similar in the way they paid for groceries, with about half paying cash and the other half using some credit.

**Knowledge of Agricultural Concepts**

This section is concerned with determining the respondents' understanding of agricultural concepts through the use of three basic concepts - fertilizer, vaccine and improved seed - that were frequently stressed by Extension personnel in Antioquia. Here the concepts are discussed individually, and later they will be added up to make a scale which will be correlated to perceptions of the extension agents and of the extension service (Table XIV).
In the interview, the respondents were asked what they understood by each concept. Based on their answers, the respondents were classified into seven groups (see Chapter IV).

The data is presented in Table XI and it was statistically analyzed for each concept by the Kruskal-Wallis one-way analysis of variance test. The results indicated that there were significant differences among the organization respondents in relation to their understanding of each concept at the .01 level of significance for fertilizer and improved seed and at the .05 level for vaccine.

The information in Table XI shows that the levels of concept understanding were very low in spite of the fact that they were fundamental for Extension work, and as it was discussed in Chapter III, it was essential to understand the concept well if the practices associated with it were going to be adopted.

**Fertilizers.** The highest percentage of respondents were concentrated at the use level, with 39, 48, and 44 per cent for ICA, Federation and Secretariat respondents, respectively. The second highest percentage for the Federation group (32 per cent) was at the function level, while the second largest groups for ICA (27 per cent) and the Secretariat (38 per cent) were at the form level. This means that the Federation respondents had a better understanding of the concept "fertilizer" than did those of ICA and the Secretariat.
### TABLE XI

**COMPARISON OF THE RESPONDENTS OF THE THREE EXTENSION ORGANIZATIONS BY THEIR KNOWLEDGE OF SELECTED CONCEPTS, ANTIOQUIA, COLOMBIA, 1971**

<table>
<thead>
<tr>
<th>Knowledge of Selected Concepts</th>
<th>Percentage by Organization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>ICA Federation</strong></td>
<td><strong>Secretariat</strong></td>
</tr>
<tr>
<td><strong>Fertilizers</strong></td>
<td><strong>N=126</strong></td>
<td><strong>N=127</strong></td>
</tr>
<tr>
<td>Wrong</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>None</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Form</td>
<td>27</td>
<td>5</td>
</tr>
<tr>
<td>Content</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Use</td>
<td>39</td>
<td>48</td>
</tr>
<tr>
<td>Function</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>Meaning</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Vaccines</strong></td>
<td><strong>N=126</strong></td>
<td><strong>N=127</strong></td>
</tr>
<tr>
<td>Wrong</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>None</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Form</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Content</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Use</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>Function</td>
<td>35</td>
<td>47</td>
</tr>
<tr>
<td>Meaning</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Improved Seed</strong></td>
<td><strong>N=126</strong></td>
<td><strong>N=127</strong></td>
</tr>
<tr>
<td>Wrong</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>None</td>
<td>26</td>
<td>18</td>
</tr>
<tr>
<td>Form</td>
<td>43</td>
<td>18</td>
</tr>
<tr>
<td>Content</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Use</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>Function</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Meaning</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
**Vaccines.** The distribution of the organization respondents according to levels of understanding of the concept "fertilizer", but there was a higher concentration of respondents at the function level. This meant that the respondents understood more about vaccines than fertilizers, perhaps due to the association they made with the vaccination of human beings.

**Improved seed.** Relatively speaking, the respondents' understanding of the concept "improved seed" was the lowest of the three concepts. In effect, ICA respondents were highly concentrated in the three lowest levels, while the Federation and Secretariat respondents showed their highest percentages at the content and use levels.

**Clients' Perception and Null Hypotheses**

As mentioned earlier in this chapter, this is the second major sub-heading for the presentation of the findings. A major characteristic of this group is that it is made up of continuous variables or factors that were subjected to analysis of variance and correlation coefficient tests in order to reject or fail to reject the hypotheses of the study; thereby establishing the association of factors or variables to perception of the Extension agents and perception of the Extension Service.
Perception

As indicated earlier in Chapter IV, the clients' perception of the Extension agent and the Extension Service was obtained through an attitude scale that consisted of five strata; strongly agree, agree, undecided, disagree and strongly disagree, with a range of score from one through five for each item. Five represented the most favorable and one the least favorable response.

In the interview, ten items or statements for the Extension agent and ten for the Extension Service were presented to each respondent in an effort to establish perception. A copy of the scale is found in Appendix A. The scores of each of the ten items were added up to make the perception scale for the Extension agent and the perception scale for the Extension Service.

Extension Agent Perception

Data pertaining to the perception of the Extension agent by the respondents is presented in Table XII. The results of the statistical analysis by the analysis of variance test yielded an F value of 41.77 which indicated that there was a significant difference among the respondents of the three organizations in relation to perception of the Extension agent at the .01 level of significance with two and 367 degrees of freedom.
TABLE XII

COMPARISON OF THE THREE EXTENSION ORGANIZATIONS
BY CLIENTS' PERCEPTION OF THE EXTENSION
AGENT AND THE EXTENSION SERVICE,
ANTIOQUIA, COLOMBIA, 1971

<table>
<thead>
<tr>
<th>Perception</th>
<th>ICA</th>
<th>Federation</th>
<th>Secretariat</th>
<th>Total</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=136</td>
<td>N=127</td>
<td>N=107</td>
<td>N=370</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Extension Agent**

<table>
<thead>
<tr>
<th>Mean</th>
<th>37.0</th>
<th>42.1</th>
<th>40.1</th>
<th>39.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Score</td>
<td>25.0</td>
<td>29.0</td>
<td>29.0</td>
<td>25.0</td>
</tr>
<tr>
<td>Maximum Score</td>
<td>49.0</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Standard Dev.</td>
<td>5.0</td>
<td>4.3</td>
<td>4.3</td>
<td>5.1</td>
</tr>
</tbody>
</table>

**Extension Service**

<table>
<thead>
<tr>
<th>Mean</th>
<th>38.7</th>
<th>42.3</th>
<th>40.7</th>
<th>40.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Score</td>
<td>29.0</td>
<td>26.0</td>
<td>23.0</td>
<td>23.0</td>
</tr>
<tr>
<td>Maximum Score</td>
<td>49.0</td>
<td>50.0</td>
<td>49.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Standard Dev.</td>
<td>4.5</td>
<td>3.8</td>
<td>5.2</td>
<td>4.7</td>
</tr>
</tbody>
</table>
The data in Table XII also revealed that the Federation's respondents (42.1 mean score) had higher perception scores, followed by the Secretariat's respondents (40.1 mean score) and lastly by the ICA respondents (37.0 mean score). It also shows that the Extension agent perception scores for ICA respondents ranged from 25 to 49, while for both the Federation and for the Secretariat respondents the range went from 29 to 50. This meant that there was a small group of clients who had unfavorable perceptions of the Extension agent since a score of 30 was the mid-point in the scale, indicating a basically undecided perception.

**Extension Service Perception**

Table XII also presents data pertaining to perception of the Extension Service by the respondents. The results of the statistical analysis by the analysis of variance test yielded an F value of 20.81 which indicated that there was a significant difference among the respondents of the organizations in relation to perception of the Extension Service at the .01 level of significance with two and 367 degrees of freedom.

The data in Table XII also revealed that the Federation respondents showed higher mean perception scores (42.3) as compared with the respondents of the other two organizations.
The Federation was followed by the Secretariat (40.7) and ICA (38.7) in relation to the respondents' degree of favorableness of perception. The minimum perception score for the Secretariat was 23, followed by the Federation with 26 and ICA with 29. Just the same as with the perception of the Extension agents, there was a group of respondents who had an unfavorable perception of their respective Extension Services (mid-point scale score of 30).

The data in Table XII indicated that the respondents' perception of their respective Extension Services in the overall was slightly more favorable than the respondents' perception of the Extension agent, but there were some respondents who had lower perception scores for the Extension Service than for the Extension agent in the Federation and Secretariat organizations, as indicated by the data in the preceding paragraphs.

Schooling

The first null hypothesis of the study dealt with schooling or total number of years or grades completed in school. It was stated as follows:

There is no relationship between the degree of favorableness of the clients' perception of the Extension agent and their level of schooling.
The data in Table XIII shows the respondents total mean years of schooling and the variation in schooling means among the three organizations. The analysis of variance test yielded an F value of 17.91 which indicated that there was a significant difference among the respondents of the organizations in relation to respondents' schooling at the .01 level of significance with two and 367 degrees of freedom. The Secretariat's respondents had a schooling mean of 3.4 years, followed by the Federation with 3.2, and ICA with 1.7. This means that the Secretariat's respondents had a higher degree of literacy, but they were followed very closely by the Federation's respondents.

The association between schooling and perception of the Extension agent was tested by the use of the correlation coefficient. The data in Table XIV indicates that for the total sample of respondents there was a relationship between the degree of favorableness of the clients' perception of the Extension agent and their level of schooling at the .01 level of significance.

When correlation coefficients were computed within the organizations, the null hypothesis was not rejected. This procedure actually partitioned schooling into three segments, and the examination of the relationship among these variables
TABLE XIII

COMPARISON OF THE THREE EXTENSION ORGANIZATIONS BY THE SELECTED VARIABLES
USED IN THE STUDY, ANTIOQUIA, COLOMBIA, 1971

<table>
<thead>
<tr>
<th>Selected Variables</th>
<th>Mean Scores by Organizations</th>
<th>Standard Deviation</th>
<th>F. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICA N=136</td>
<td>Federation N=127</td>
<td>Secretariat N=107</td>
</tr>
<tr>
<td>1. Schooling</td>
<td>1.7</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>2. Age</td>
<td>46.2</td>
<td>48.4</td>
<td>46.1</td>
</tr>
<tr>
<td>3. Economic Status</td>
<td>6.7</td>
<td>9.3</td>
<td>7.9</td>
</tr>
<tr>
<td>4. Practices</td>
<td>2.5</td>
<td>4.6</td>
<td>2.7</td>
</tr>
<tr>
<td>Learned</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Practices</td>
<td>1.6</td>
<td>4.3</td>
<td>2.5</td>
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<tr>
<td>Used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Knowledge</td>
<td>7.8</td>
<td>10.8</td>
<td>9.8</td>
</tr>
<tr>
<td>Agricultural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concepts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Mass Media</td>
<td>3.5</td>
<td>5.2</td>
<td>5.8</td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Contact</td>
<td>6.8</td>
<td>3.6</td>
<td>9.5</td>
</tr>
<tr>
<td>Selected Variables</td>
<td>Mean Scores by Organizations</td>
<td>Standard Deviation</td>
<td>F. Value</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------</td>
<td>--------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>ICA</td>
<td>Federation</td>
<td>Secretariat</td>
</tr>
<tr>
<td></td>
<td>N=136</td>
<td>N=127</td>
<td>N=107</td>
</tr>
<tr>
<td>Knowledge Extension</td>
<td>1.3</td>
<td>2.3</td>
<td>2.3</td>
</tr>
</tbody>
</table>

^aSignificant at the .01 level of significance.
# TABLE XIV

RELATIONSHIPS OF PERCEPTION SCORES OF THE RESPONDENTS TOWARD THE EXTENSION AGENT AND THE EXTENSION SERVICE WITH THE VARIABLES CONSIDERED IN THE STUDY ACCORDING TO ORGANIZATIONS, ANTIOQUIA, COLOMBIA, 1971

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total N=370</th>
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<th>Federation N=127</th>
<th>Secretariat N=107</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Agent Service</td>
<td>Agent Service</td>
<td>Agent Service</td>
<td>Agent Service</td>
</tr>
<tr>
<td>1. Schooling</td>
<td>.14&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.03</td>
<td>.12</td>
<td>.02</td>
</tr>
<tr>
<td>2. Age</td>
<td>.00</td>
<td>-.07</td>
<td>.01</td>
<td>-.04</td>
</tr>
<tr>
<td>3. Economic Status</td>
<td>.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.07</td>
<td>.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.13</td>
</tr>
<tr>
<td>4. Practices Learned</td>
<td>.32&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.19&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.14</td>
<td>-.08</td>
</tr>
<tr>
<td>5. Practices Used</td>
<td>.39&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.28&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.02</td>
</tr>
<tr>
<td>6. Knowledge Agricultural Concepts</td>
<td>.21&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.14&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.22&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.21&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Variables</td>
<td>Total (N=370)</td>
<td>ICA (N=136)</td>
<td>Federation (N=127)</td>
<td>Secretariat (N=107)</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------------</td>
<td>-------------</td>
<td>--------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Mass Media Exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>.25&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.18&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.22&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.13</td>
</tr>
<tr>
<td>Contact</td>
<td>.12&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.06</td>
<td>.23&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.07</td>
</tr>
<tr>
<td>Knowledge of Extension Organizations</td>
<td>.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.18&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.18&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Significant at the .01 level of significance.

<sup>b</sup> Significant at the .05 level of significance.
for each organization indicated that there was a positive association, but not a significant one, for the ICA and the Federation respondents, and a negative association for the Secretariat respondents, although it was also not significant. If the hypothesis is then considered within the organizations, it is supported by the results.

If the term Extension agent is changed to the term Extension Service in the hypothesis, the correlation coefficient in Table XIV supports the null hypothesis. When the correlation coefficient was computed within the organizations, there was not a significant difference for the ICA and the Federation respondents, but for the Secretariat respondents there was a significant, but negative relationship at the .05 level of significance.

The results indicate that the more educated Secretariat respondents had a less favorable perception of the Secretariat's Extension Service. For ICA and the Federation, the relationship was inverse to that of the Secretariat, but it was non-significant so no relationship could be established with confidence.

Age

The second null hypothesis dealt with the respondents' age and was stated in the following terms:

There is no relationship between the degree of favorableness of clients' perception of the Extension agent and their age.
The data in Table XIII shows mean ages for the total group of respondents and the variation in mean ages among the three organizations. The results of the statistical analysis by the analysis of variance test yielded an F value of 1.38 which indicated that there was not a significant difference among the respondents of the organizations in relation to respondents' ages at the .05 level of significance with two and 367 degrees of freedom. The average mean age of the respondents was 46.9.

The results of the analysis by the correlation coefficient supported the null hypothesis in the overall and for the three organizations. It was interesting to note that there was a negative, but not a significant relationship, between age and Extension agent perception for the Federation and Secretariat respondents.

For the Extension Service, the results of the correlation analysis showed similar results to those of the Extension agent, and the correlation coefficients were all negative, although not significant.

Economic Status

The third null hypothesis of the study dealt with the economic status of the respondents and was as follows:

There is no relationship between the degree of favorableness of the clients' perception of the Extension agent and their economic status.
As indicated in Chapter IV, the economic status of the respondents was obtained through a comparative rating scale made up of four items: home ownership, land tenure, amount of land and grocery expenses. The respondents' responses to each question was accorded a value which when added together formed a scale with a possible range of zero to 17.

The data in Table XIII shows the respondents' total mean score for economic status and the variation in economic status mean scores among the three organizations. The results of the statistical analysis by the analysis of variance test yielded an F value of 28.10 which indicated that there was a significant difference among the respondents of the organizations in relation to economic status at the .01 level of significance with two and 367 degrees of freedom.

In fact, the data in Table XIII shows that the Federation respondents had an economic status mean score of 9.3 and that they were followed by the Secretariat respondents with 7.9 and lastly by the ICA respondents with 6.7. Comparatively speaking, this means that the Federation was working with the wealthier respondents, while ICA was working with the poorest.

The results of the analysis of association of economic status with perception of the Extension agent by correlation.
analysis in the overall caused a rejection of the null hypothesis at the .01 level of significance (Table XIV). When the correlation coefficient was computed for each organization, the null hypothesis was supported for the Federation, but it was rejected at the .05 level of significance for ICA and the Secretariat. An interesting result was observed between ICA and the Secretariat. While ICA's respondents showed a significant and positive association at the .05 level of significance, the Secretariat respondents showed a significant and negative association at the .05 level. This means, therefore, that higher economic status was associated with favorable perceptions for ICA and less favorable perceptions for the Secretariat.

If the null hypothesis was considered for the Extension Service data, the overall correlation coefficient supported the null hypothesis, but for each organization the null hypothesis was rejected for the Secretariat. The economic status of the Secretariat respondents showed a significant and negative association. This meant that for the Extension agent those Secretariat respondents with higher economic status had a less favorable perception of the Extension Service than did those with lower economic status.
Practices Learned

The fourth null hypothesis of the study dealt with the number of practices learned by the respondents from Extension personnel. It was stated as follows:

There is no relationship between the degree of favorableness of clients' perception of the Extension agent and the number of practices learned from Extension agents.

The data in Table XIII shows the respondents' total mean score for practices learned and the variation in the mean number of practices learned among the three organizations. The results of the statistical analysis by the analysis of variance test yielded an F value of 36.82 which indicated that there was a significant difference among the respondents of the organizations in relation to the number of practices learned from the Extension agent at the .01 level of significance with two and 367 degrees of freedom.

In fact, data in Table XIII shows the mean number of practices learned by the Federation respondents from Extension agents was 4.6 and that they were followed by the Secretariat respondents with 2.7 and the ICA respondents with 2.5. This means that the Federation respondents had learned more practices from the Extension agent than had the respondents of the other two organizations.
The results of the overall analysis of association between the number of practices learned from the Extension agent and the perception of the Extension agent by the correlation coefficient indicate that the null hypothesis was rejected at the .01 level of significance. Table XIV also shows the correlation coefficient between number of practices learned from Extension agents and the perception of Extension agents by the organization respondents. In this case, the null hypothesis was supported for ICA respondents, but rejected for the Federation respondents at the .05 level of significance and the Secretariat respondents at the .01 level of significance. This means that for the Secretariat and the Federation respondents those clients who had learned more from Extension agents had a more favorable perception of the Extension agent.

When the null hypothesis was considered for the Extension Service, the overall correlation coefficient warranted a rejection of the null hypothesis at the .01 level of significance. At the organization level, the null hypothesis was rejected only for the Secretariat respondents at the .01 level. For the Federation and ICA respondents, the null hypothesis was supported. For ICA, there was a negative trend toward association of number of practices learned and perception of the Extension Service.
Practices Adopted

The fifth null hypothesis of the study dealt with the number of improved practices used by respondents on their farms and the perception of the Extension agent. It was stated as follows:

There is no relationship between the degree of favorableness of the clients' perception of the Extension agent and the number of practices used in their farms.

The data in Table XIII shows the total mean number of practices used by the respondents on their farms and the variation in the mean number of practices used by respondents among the three organizations. The results of the statistical analysis by the analysis of variance test yielded an F value of 36.82 which indicated that there was a significant difference among the respondents of the organizations in relation to the number of practices adopted on their farms at the .01 level of significance with two and 367 degrees of freedom.

In fact, Table XIII shows that the Federation respondents had a mean number of 4.3 practices used on their farms, followed by the Secretariat respondents with 2.5, and the ICA respondents with 1.6. This means that the Federation respondents used more of the practices taught by Extension agents.
In Table XIV the results are presented of the analysis of the association between the number of practices adopted and the perception of the Extension agent by correlation analysis. The results caused the rejection of the null hypothesis at the .01 level of significance. When the correlation coefficients were computed for each of the organizations, the null hypothesis was rejected for all three organizations; for ICA at the .05 level of significance, and for the Federation and the Secretariat at the .01 level. This means that the respondents who had used more practices taught by Extension personnel had more favorable perceptions about the Extension agents.

If the null hypothesis is applied to the Extension Service, the results of the statistical analysis of data by correlation analysis also suggested a rejection of the null hypothesis for the overall group. When the analysis was made within the organizations, the null hypothesis was rejected for the Federation at the .05 level of significance, and for the Secretariat at the .01 level. The null hypothesis was supported for ICA. This means that those respondents of the Federation and the Secretariat who had used more practices taught by the Extension agents had a more favorable perception of the Extension Service, while for the ICA respondents the use of practices was not related to the favorableness of perception.
Knowledge of Agricultural Concepts

The sixth null hypothesis of the study dealt with the knowledge of agricultural concepts. It was stated as follows:

There is no relationship between the degree of favorableness of the clients' perception of the Extension agent and their knowledge of agricultural concepts.

As indicated in Chapter III, the respondents' level of knowledge of agricultural concepts was obtained through a comparative rating scale made up of three main concepts; fertilizer, vaccine and improved seed. The respondents' understanding of each concept received a value which added up to make a scale with a range from zero to 18.

Table XIII shows the respondents' total mean score and the variation among mean scores for the three organizations on knowledge of these concepts. The results of the statistical analysis by the analysis of variance test yielded an F value of 20.65 which indicated that there was a significant difference among the respondents of the organizations in relation to their level of knowledge of agricultural concepts at the .01 level of significance with two and 367 degrees of freedom. This means that the respondents' knowledge of concepts was associated with the organization with which they were clients.
In Table XIV the results are presented of the analysis of the association between knowledge level of agricultural concepts and perception of the Extension agent. The null hypothesis was rejected at the .01 level of significance for the total group, but when the correlation coefficients were computed within the organizations, the null hypothesis was supported for the Federation. For ICA it was rejected at the .01 level of significance, while for the Secretariat it was rejected at the .05 level and the association was a negative one. This has an important meaning for the organizations because for the Secretariat those respondents with higher knowledge of agricultural concepts had a less favorable perception of Extension than did those with lesser knowledge. This was emphasized by the results of the association between perception and the variables, schooling and economic status. For the Federation, the meaning was that in spite of the respondents adopting more practices than did those of the other organizations, the respondents may have used them without knowing what they were doing. This can be explained by the use of credit by the Federation's clients (see Chapter III) in the sense of certain compulsory features. For ICA, this finding means that the respondents who had realized the meaning of the concepts had a more favorable perception of the Extension agent.
If the null hypothesis is altered to include the Extension Service, it was also rejected at the .01 level of significance. Within the organizations, the null hypothesis was rejected only for ICA at the .05 level of significance. For the Federation and the Secretariat, the null hypothesis was supported.

**Exposure to Mass Media**

The seventh null hypothesis of the study dealt with the exposure to mass media. It was stated in this way:

There is no relationship between the degree of favorableness of the clients' perception of the Extension agent and their exposure to mass media.

As indicated in Chapter IV, the respondents' exposure to mass media was obtained through a comparative rating scale made up of four items: radio, newspaper, visits to nearby towns and visits to Medellín. The respondents' answers to each item received a value which when added up formed a scale with a range from zero to eight.

Table XIII shows the respondents' total mean score and the variation of mean scores for the three organizations. The results of the statistical analysis by the analysis of variance test yielded an F value of 76.56 which indicated that there was a significant difference among the respondents of the organizations in relation to their level of exposure to mass media at the .01 level of significance with two and 367 degrees of freedom.
In effect, the data in Table XIII shows that the Secretariat respondents had the highest mean score for mass media exposure (5.8), followed by the Federation respondents (5.2) and the ICA respondents (3.5). This means that the Secretariat's respondents were exposed more to information presented through the mass media than were the respondents of the other two organizations. It was also important to note the low exposure to mass media by ICA's respondents. These results can be understood by the low schooling level and the low economic status of ICA respondents.

In Table XIV the results are presented of the analysis of association by the correlation coefficient. The results indicate a rejection of the null hypothesis at the .01 level of significance. When the correlation coefficients were computed within the organizations, the null hypothesis was rejected at the .01 level of significance for ICA. For the Federation and the Secretariat the null hypothesis was supported, even though for the Secretariat there was a negative, but not significant association. This means that for ICA only the respondents' exposure to mass media was related to favorableness of perception of the extension agent.

If the null hypothesis is changed to include the Extension Service, the results of the statistical analysis by the correlation coefficient caused a rejection of the null hypothesis at the .01 level of significance. When the
correlation coefficients were computed within the organizations, they supported the null hypothesis for the three organizations.

**Contact with Extension Personnel**

The eighth null hypothesis of the study dealt with the respondents' extent of contact with Extension personnel and it was stated as follows:

> There is no relationship between the degree of favorableness of the clients perception of the Extension agent and their extent of contact with Extension personnel.

As indicated in Chapter IV the respondents' extent of contact with Extension personnel was obtained by adding up the number of times the respondent had contact with extension personnel through selected media during the months of June and July.

Table XIII shows the respondents' total mean score and the variation among the mean scores for the three Extension organizations for the extent of contact that the respondents had with extension personnel. The results of the statistical analysis by the analysis of variance test yielded an F value of 24.24 which indicated that there was a significant difference among the respondents of the organizations in relation to their extent of contact with Extension personnel at the .01 level of significance with two and 267 degrees of freedom. In effect the Secretariat respondents presented the highest mean contact score with Extension personnel (9.5), followed by ICA respondents with a mean of 6.8 and finally by the Federation respondents with a mean of 3.6
In Table XIV the results are presented of the analysis of association by the correlation coefficient. The results indicated a rejection of the null hypothesis at the .01 level of significance. When the correlation coefficients were computed within the organizations, the null hypothesis was rejected for ICA and the Secretariat at the .01 level of significance. For the Federation the null hypothesis was supported. This means that the extent of contact with extension personnel was associated with favorableness of the respondents' perception of the Extension personnel for ICA and the Secretariat, but not for the Federation.

If the null hypothesis was altered to include the Extension Service, it was supported for ICA and the Federation and rejected for the Secretariat at the .05 level of significance. This means that extent of contact had little relationship with the respondents' perception of the Extension Service.

**Knowledge of Extension Organizations**

The extent of knowledge of the respondents of the Extension organizations was obtained by asking the respondents in the interview what they knew about the organizations (see Table VI). The respondents' responses to each organization were added up to make a scale with a range of zero to six.
Table XIII shows the respondents' total mean score and the variation among the mean scores for the respondents of the three organizations. The results of the statistical analysis by the analysis of variance test yielded an F value of 19.28 which indicated that there was a significant difference among the respondents of the organizations in relation to their knowledge of Extension organizations at the .01 level of significance with two and 367 degrees of freedom. In fact, the Secretariat and the Federation respondents had a mean score of 2.3 while ICA's respondents had only a score of 1.3. This means that the Federation and Secretariat respondents knew more about their organization and other organizations, while the ICA respondents were much less knowledgeable.

In Table XIV the results are presented of the analysis of association of perceptions by the correlation coefficient. These results show a significant and positive association between the respondents' knowledge of extension organizations and the respondents' perception of the Extension agent and the Extension Service at the .01 level of significance. When the correlation coefficients were computed within the organizations, a significant and positive association was present at the .05 level of significance only for ICA. There was no association for the Federation and the Secretariat.
CHAPTER VI

SUMMARY, CONCLUSIONS, AND SUGGESTIONS

This study deals mainly with clients' perception of the extension agents and of the extension services of the three extension organizations which operate in the State of Antioquia, the Colombian Agricultural Institute (ICA), the Coffee Growers Federation, and the Secretariat of Agriculture of the State of Antioquia.

Research Design

The research design is summarized under three sections: a) objectives and hypotheses, b) data collection, and c) scales.

Objectives and Hypotheses. The main objective of this study was to determine the clients' perception of the extension services and of the extension agents who represent those organizations, and to determine the association of the clients' perception with selected variables by rejecting or failing to reject the null hypotheses. The null hypotheses were postulated with the following variables: schooling, age, economic status, practices learned from extension personnel,
practices used on the farm out of those learned from extension personnel, knowledge of agricultural concepts, exposure to mass media and contact with extension personnel.

Data Collection. An interview schedule, pretested twice, was used. Since the study included three organizations, a combination of probability and nonprobability sampling was used. Data was collected during August and September, 1971 by fourth year students of the School of Agriculture of the National University at Medellin and by the author. Data was analyzed using the statistical techniques of Chi-square, Kruskal-Wallis, analysis of variance and correlation coefficient.

Scales. A Likert-type scaling technique was used for determining the perception of the clients toward the extension services and toward the extension agents. After the second pre-test, an item analysis of the scale, by the method of "Comparison of Extreme quartiles" was made in order to eliminate inconsistencies and increase validity. Eleven items were found to be significant and therefore showed consistent disimination.

Some independent variables were defined by groups on the basis of comparative rating scales. These variables were: economic status, knowledge of agricultural concepts, exposure to mass media and contact with extension personnel.
Findings

The results or findings of the study were presented under two major sections: a) Comparison of the organizations in relation to their clients and their impact on the clients, and b) Clients perception and hypotheses where the association of perception with selected factors were discussed, based on the rejection or failure to reject the null hypotheses.

A. Comparison of Extension Organizations

This comparison was made by analyzing the organizations in relation to some characteristics of their clients. Since these characteristics were discrete data, the Chi-square and the Kraskal-Wallis one-way analysis of variance tests were used.

The following are the results of the statistical analysis:

1. Size of Families: No significant difference was found among the organizations with respect to the size of families of their respondents. An average of about six dependents were present in each household.

2. Family Type: No significant difference was found among the three organizations for the respondents family type. A high proportion of the nuclear family type was found.
3. **Need of Credit:** No significant difference existed among the organizations for the respondents expressed need of credit for the operation of their farms. A very high percentage of respondents said they needed credit and many expressed the impossibility of obtaining it, due to many requirements and lack of ownership of property.

4. **Purchasing of Groceries:** No significant difference was found among the organizations for the respondents' manner of paying for groceries using credit, cash or both.

5. **Principal Occupation:** A significant difference was obtained among the three organizations in relation to the respondents' principal occupation. The Secretariat had more clients in non-farming occupations, followed by the Federation and ICA. ICA also had many (33 per cent) respondents whose main occupation was as a hired-hand in farming.

6. **Place of Residence:** A significant difference was found among the organizations as to the respondents place of residence, indicating that some organizations worked more with urban residents than the others. It was found that the Secretariat had 40 per cent of their respondents living in urban areas, the Federation 20 per cent and ICA had none.
7. **Extrinsic Motivation**: A significant difference was found among the organizations as to the respondents taking action to increase production, indicating that the organizations' clientele differed in their interest in increasing crop yields. This showed that they had not been motivated adequately or that the organizations were working with the wrong clientele. The Federation had the lowest percentage of clients who had done nothing, while ICA and the Secretariat were almost equal in percentages (16 and 15 per cent, respectively).

8. **General Knowledge about Extension**: A significant difference was found among the organizations as to the respondents' knowledge about extension, indicating that there was differing levels of knowledge about extension among the respondents for the three organizations.

9. **Specific Knowledge of Extension Organizations**: A significant difference was found among the organizations as to their respondents' level of knowledge of their organization. In fact, the respondents of an organization knew more about his organization than did the respondents of the other organizations about his organizations.

10. **Sources for Advice**: A significant difference was obtained among the three organizations in relation to the respondents' requests for advice when they had problems in crop or livestock production. The Federation respondents requested more advice from extension personnel when they had problems with their crops than did the ICA and Secretariat
respondents. In the same way, the Federation respondents requested less advice from extension personnel when they had a problem with livestock than did the respondents from ICA and Secretariat.

11. Effects of Practices Adopted: A significant difference was obtained among the organizations as to the respondents' classification of the effects of the practices adopted out of those learned from extension personnel.

12. Relationship of Practices Learned with Sources of Income: A significant difference existed among the organizations in relation to the practices learned from extension personnel by the respondents in association with sources of income, indicating that a difference existed among the organizations' clientele as to the usefulness of the practices learned to sources of income.

13. Use of Credit: A significant difference was found among the organizations as to their respondents' patterns of debt. ICA respondents owed less to official agencies than did respondents from the Federation and the Secretariat.

14. Knowledge of Agricultural Concepts: The understanding of agricultural concepts was measured using three concepts: fertilizer, vaccine and improved seed. A significant difference was obtained among the organizations as to their respondents' level of understanding of each concept. The Federation
respondents had a higher level of understanding of fertilizer than did respondents of ICA and the Secretariat. For the concept improved seed, ICA respondents had the lowest level of understanding.

B. *Clients' Perception and Hypotheses*

The clients' perception of the extension services and of the extension agent was determined by Likert-type scales made up of ten items for each one. The association of perception with selected variables was determined by rejecting the null hypotheses. The findings of this section are presented in two groups: 1) clients' perception and 2) independent variables and their association with perception.

1. **Clients' Perception:** The clients' perception was determined for the extension agent and for the extension services.

   a. **Clients' Perception of Extension Agents:** A significant difference existed among the organizations and their clients' perception of the extension service, indicating that the organizations differed in their clients' degree of favorableness of perception toward the extension agent. The Federation's respondents had more favorable perceptions of its extension agents and ICA's respondents had less favorable perceptions of its extension agents.
b. **Clients Perception of Extension Service**: A significant difference was found among the organizations as to their clients' perception of the extension service. The clients' favorableness of perception for the extension service followed the same pattern of the clients' perception of the extension agent. The perception of the extension service was slightly more favorable than was the perception of the extension agents.

2. **Independent Variables and their Association with Perception**: The independent variables were analyzed to determine if they differed significantly among the organizations using the analysis of variance test. Associations with perception were determined by correlation coefficients for the total sample and within the organization groups. The direction of the association was positive except for otherwise stated.

a. **Age**: No significant difference was found among the organizations as to the age of the respondents.

(1) **Null hypothesis - extension agent**: The null hypothesis was supported. When examined for the organizations the null hypothesis was supported, even though for the Federation and the Secretariat there was a negative direction.
(2) **Null hypothesis - extension service:** The null hypothesis was supported, although the direction was negative. When looked at within the three organization groups, the null hypothesis were also supported.

b. **Schooling:** A significant difference existed among the organizations in relation to the number of years in school completed by the respondents. In effect the respondents of ICA were less educated than were the respondents of the other organizations.

(1) **Null hypothesis - extension agent:** The null hypothesis was rejected, indicating an association between favorableness of clients' perception of the extension agent and number of years completed in school.

When the perception of the extension agent in relation to schooling was examined for the organizations, the null hypothesis was supported for all three organizations.

(2) **Null hypothesis - extension service:** The null hypothesis was supported, indicating that there was not an association between respondents' perception of the extension service and schooling.

When perception of the extension service was looked at within the organizations, it was rejected only for the Secretariat where a negative association with years of schooling was established.
c. **Economic Status:** A significant difference was found among the organizations in relation to their respondents' economic status. In effect, the respondents of the Federation had higher economic status while ICA's had the lowest.

   (1) **Null hypothesis - extension agent:** The null hypothesis was rejected, indicating an association between favorableness of clients' perception of the extension agent and their economic status.

   When the association was examined within the organizations, the null hypothesis was rejected for ICA and the Secretariat, but not for the Federation. The association for the Secretariat was negative and for ICA it was positive. This means that for ICA the respondents with higher economic status had better perceptions of the extension agent and for the Secretariat the respondents with higher economic status had less favorable perception.

   (2) **Null hypothesis - extension service:** The null hypothesis was supported, therefore no association was present. When looked at within the organizations, it was rejected negatively for the Secretariat, indicating that those respondents with higher economic status had less favorable perceptions than did those with lower economic status. For ICA and the Federation, the null hypothesis was supported.
d. Practices Learned from Extension Personnel: A significant difference was found among the organizations as to the number of practices learned from extension personnel. The respondents from the Federation had learned more and the ones for ICA, the least.

(1) Null hypothesis - extension agent: The null hypothesis was rejected; therefore an association existed between favorableness of clients' perception toward the extension agent and the number of practices learned from extension personnel.

When the association was looked at within the organizations, the null hypothesis was rejected for the Federation and the Secretariat, indicating an association between favorableness of clients' perception with the number of practices they had learned from extension personnel.

(2) Null hypothesis - extension service: The null hypothesis was rejected, indicating an association between favorableness of perception of the extension service and the number of practices learned from extension personnel.
When examined within the organizations it was rejected only for the Secretariat, indicating for the Secretariat an association between favorableness of clients' perception of the extension service with the number of practices learned from extension personnel. For ICA and for the Federation the null hypothesis was supported; therefore no associations were present.

e. Practices Adopted Out of Those Learned from Extension Personnel: A significant difference was found among the respondents of the organizations in relation to the number of practices adopted out of those taught by extension personnel. The Federation respondents had adopted more practices, while ICA's respondents had adopted the lowest number of practices.

(1) Null hypothesis - extension agent: The null hypothesis was rejected, indicating an association between favorableness of clients' perception of the extension agent and the number of practices adopted out of those taught by extension personnel.

(2) Null hypothesis - extension service: The null hypothesis was rejected, indicating an association between favorableness of respondents' perception of extension service and the number of practices used out of those learned from extension personnel.
When examined within the organizations, the null hypothesis was rejected for the Federation and for the Secretariat, indicating an association between respondents' favorableness of perception and number of practices used.

f. Knowledge of Agricultural Concepts: A significant difference was found among the respondents of the organizations in relation to respondents' knowledge of agricultural concepts. The respondents for the Federation had higher levels of understanding, followed by the respondents from the Secretariat and ICA, respectively.

(1) Null hypothesis - extension agent: The null hypothesis was rejected, indicating an association between respondents' knowledge of agricultural concepts and favorableness of clients' perception toward the extension agent.

When perception of the extension agent was examined for the organizations, the null hypothesis was rejected for ICA and for the Secretariat. The association for the Secretariat was negative. This means that the Secretariat's respondents with higher levels of knowledge of agricultural concepts had less favorable perceptions of the extension agent. For ICA those respondents with higher knowledge of agricultural concepts had more favorable perceptions of the extension agent.
(2) **Null hypothesis - extension service:** The null hypothesis was rejected, indicating an association between knowledge of agricultural concepts and favorableness of perception of the extension service.

When looked at within the organizations, the null hypothesis was rejected only for ICA, indicating that for ICA those respondents with higher levels of concept understanding had more favorable perceptions of the extension service.

g. **Mass Media Exposure:** A significant difference was found among the respondents of the organizations in relation to respondents' exposure to mass media. The Secretariat's respondents had a higher level of exposure to mass media, while ICA's respondents had the lowest.

(1) **Null hypothesis - extension agent:** The null hypothesis was rejected, indicating an association between favorableness of respondents' perception of the extension agent and their exposure to mass media.

When examined for the organizations, the null hypothesis was rejected only for ICA, indicating an association between favorableness of clients' perception of the extension agent and clients exposure to mass media.
(2) **Null hypothesis - extension service:** The null hypothesis was rejected, indicating an association between favorableness of clients' perception of the extension service and clients' exposure to mass media.

When examined within the organizations, the null hypothesis was supported for the three organizations, indicating no associations were present for the organizations.

h. **Contact With Extension Personnel:** A significant difference was obtained among the organizations in relation to respondents' contact with extension personnel. The Secretariat's respondents had higher contact levels, while the Federation's respondents had the lowest contact level.

(1) **Null hypothesis - extension agent:** The null hypothesis was rejected, indicating an association between favorableness of clients' perception of the extension agent and contact with extension personnel.

When looked at within the organizations, the null hypothesis was rejected for ICA and for the Secretariat, indicating an association between favorableness of clients' perception of the extension agent and clients' contact level with extension personnel.
(2) **Null hypothesis - extension service:** The null hypothesis was supported, indicating no association between favorableness of clients' perception toward the extension service and extent of clients' contact with extension personnel.

When examined within the organizations, the null hypothesis was rejected only for the Secretariat, indicating an association between favorableness of clients' extent of contact with extension personnel.

i. **Knowledge of Extension Organizations:** A significant difference was found among the organizations as to the respondents' level of knowledge of the function of the organizations. The Federation and the Secretariat respondents had about the same level of knowledge about the organizations, while ICA's respondents were considerably below.

(1) **Null hypothesis - extension agent:** The null hypothesis was rejected, indicating an association between respondents' knowledge of extension organizations and favorableness of clients' perception of extension personnel.

When examined within the organizations, the null hypothesis was rejected only for ICA, indicating an association between favorableness of clients' perception of extension personnel and knowledge of extension organizations.
(2) **Null hypothesis - extension service:** The null hypothesis was rejected, indicating an association between clients' favorableness of perception of extension service and clients' knowledge of extension organizations. When examined within the organizations, the null hypothesis was rejected only for ICA, indicating an association between knowledge of extension organizations and favorableness of perception of the extension agent.

**CONCLUSIONS**

The clients' perception of the Extension agent and the extension service was generally favorable, but it is important to keep in mind that the clients interviewed came from a group which made up only 5 per cent of the farmer population of Antioquia. The most favorable clients' perception was of the Federation which is the oldest organization and the least favorable was of ICA which is the newest organization working in Antioquia.

Since age was the only factor not associated with favorableness of perception, it is logical to conclude that the perception is independent of age and favorable or unfavorable perception can be developed in younger or older clients.
The association of factors with the clients' perception of the Extension agent and of the Extension Service leads to three fundamental findings which in turn could change the philosophy and policies of the Extension Services in Colombia.

The first fundamental finding was that the clients' perception of the Extension Service was different from the clients' perception of the Extension agent. In spite of the fact that the perception of the Extension Service was slightly superior to that of the Extension agent, there was no association between the favorableness of clients' perception with the clients' years of schooling, economic status and contact with Extension personnel as was found for the Extension agent. Therefore, it is possible to infer that there were problems with the Extension Service in Colombia, and especially in Antioquia where this study was made. Since perception is based on past experiences it is important to ascertain the factors that influence the more educated, those with higher economic status and those with more contact with Extension personnel, to have wide variations in perception.

The second fundamental finding was obtained when the association of perception with the factors in the study was examined within the organizations. The results are so different that they lead one to the conclusion that it is
necessary for each organization to revise its Extension program and the methodology used to carry it out. In effect, for the Federation the clients' perception of the Extension Service was associated only with the number of practices learned from Extension personnel and the number of practices used on the farms by the clients. This occurred in spite of the fact that the Federation's clientele was the highest ranked of the three on most factors. It also had the highest percentage of respondents with practices learned related to sources of income and the highest percentage of those who were classified as increasing the effects of the practices used in the farm.

Under ICA, which had the lowest ranked clientele, there was no association with schooling and the number of practices learned from Extension personnel. It also presented the lowest percentage of respondents who had learned practices related to sources of income and this could be an explanation for the fact that no association existed between perception and the practices learned.

Some valid questions can be raised about the Secretariat's Extension program. This was the organization for which several significant negative associations were found. The clients'
perception of the Extension agent was significantly associated negatively with the clients' economic status and the clients' knowledge of agricultural concepts. It also had significant and negative associations between the clients' perception of the Extension Service and two factors, schooling and economic status.

The third fundamental finding was that only the number of practices used on the farm by the clients had positive associations with favorable perceptions of the Extension agent within the three organizations. This finding leads one to the conclusion that the most important thing was what the farmer did, and that what he did would have economic value and be successfully applied from his point of view. The economic aspect was so important because money is the universal exchange element to acquire those things necessary to satisfy felt needs, especially when they are related to physical needs.

Many other considerations and conclusions dealing with the evaluation of the services and their impact on their clientele can be drawn, but only a few of the more important ones will be mentioned here. Among them was the fact that the farmers of Antioquia shared the problem of needing credit for their farm operations, but many were unable to get it because they could
not meet the requirements of the credit agencies. Another important point was the similarity in the number of dependents. On the average six dependents lived in each household. This was very high. This would make a farmer think twice before any decision to change was made, especially if the change represented an expenditure and the farmer was poor and needed the little money available for other things important to his survival. The reasons presented by non-adopters of practices become especially significant when this aspect is considered.

An important conclusion that can be drawn from this study was the fact that the farmers requested more advice from the Federation extension personnel than did the farmers who were clients of the other organizations. This difference can be due to the fact that the Federation's work was more specific. Another reason could be the confidence that the clients had in the Extension personnel because of their training and experience and because of the stability in the agency which had reduced social distance and made the farmers less shy to approach the agents.

The farmer's perception of the practical help he could get from the Extension agent, especially if this help was related to his sources of income, could be another reason for this confidence. It was expected that a farmer would encounter his
main problems in the things essential for his survival and that this would be with his main source of income. This apparently was the case with these farmers.

The relation of practices learned to sources of income can explain the lack of interest and apathy toward some of the new practices taught. Farmers may be ignorant but they are not generally stupid. Resistance to change, as a consequence, can be attributed to this idea. Farmers may not perceive the usefulness of the idea in their circumstances.

Another important point that can be derived from this study was the low level of concept understanding, especially when it dealt with three basic concepts used almost daily by Extension personnel. As was discussed in Chapter III, a farmer who does not perceive the usefulness and meaning of a concept has not learned it and therefore, may not use it. This idea may also be a contributing factor in the sense that if a farmer doesn't understand an idea he may find it difficult to convince himself to use it.

SUGGESTIONS

Based on the analysis and observations of data, some suggestions are presented for the organizational operation and for further research.
A Suggestion for Extension Operations:

1. Focus extension work on the teaching of practices that can do the most good for the largest number of farmers and which are related to their sources of income.

2. Since the organizations work so independently and each one has some good aspects, a series of meetings to exchange ideas and experiences should be undertaken in order to find ways to make extension work more effective and better adapted to local conditions.

3. Create an Indemnity Fund to be used to minimize clients' fear of risk and to assure them that the new technology is good. Based on the fund, the extensionists could sign contracts with the clients, making the extension service responsible for any failure with the new practice used by the client. With the contract, the client can get money from an official credit agency, since even if the new practice fails the credit agency would be paid back by means of the contract which would serve as collateral for the loan. Farmers who sign this contract can get loans, even if they do not have evidence of land ownership and financial resources to obtain credit, thereby enhancing human dignity. This suggestion carries in itself a challenge to the extensionists and to the extension service. They must know very well what they are advising or teaching the farmers to do.
4. Change the reporting system for extension work. Reports must be made based on what the farmers do which is the most important thing. The present reporting system is good for impressing politicians and others. According to Hoyos (53) this reporting is inflated by the extensionists to appear better in front of their superiors. Reporting extension work on what the farmers do will enable work to be evaluated better and the analyses made of the motives that farmers have for reverting to old patterns of doing things or for not changing.

5. Try to involve in extension work the agronomists, veterinarians and capable individuals who live in rural areas. They could be very efficient extension leaders because they should know the main problems of their neighbors and have a true desire to help them.

6. Create incentives for those professionals who are able to live in rural areas. A scale of salary bonuses of up to 30 per cent should be established for those extensionists who go to live in rural communities to compensate them for the deprivations they would be subjected to in the rural areas as compared with the accommodations they have in the cities.

7. Intensify applied research at farmers level. In working with poor farmers there is no need to be highly sophisticated. Simple things are easier to understand, easier
to do and do not require the high expenses. More complex practices, which are not understood, and which require substantial financial resources do not meet with great success under conditions where resources are limited and educational levels are low.

B. Suggestions for Further Research

1. Study ways to make extension services available to the largest number of farmers. Presently it only covers 5 per cent of Antioquia's farmers.

2. Undertake studies within the organizations to determine and thereby correct those factors which hamper the effectiveness of extension work.

3. Find out the best ways to teach farmers new ideas or concepts.

4. Make a careful evaluation of the practices which are being taught to farmers in order to see if they could be perceived by farmers as something useful.

5. Make a study of the friendship groups organized by the Federation. This could lead to the development of an extension service more adapted to local conditions.

6. It could be of interest to find out the perceptions of the other 95 per cent of the farmers of Antioquia who were not included in the study and to make comparisons with those who were.
BIBLIOGRAPHY
BIBLIOGRAPHY

A. BOOKS


B. PUBLICATIONS OF THE GOVERNMENT AND OTHER ORGANIZATIONS


C. PERIODICALS


D. UNPUBLISHED MATERIALS


APPENDIX
APPENDIX A

INTERVIEW SCHEDULE

Extension Agency _______________________________ # __________

Work Front ________________________________

Organization ________________________________

Interviewer ________________________________ Interviewee __________

1. How many years have you been living in this vereda? # __________

2. How many persons live with you in the house? # __________

3. Who are the persons that live with you in the house?

<table>
<thead>
<tr>
<th>Name</th>
<th>Relationship</th>
<th>Sex</th>
<th>Age</th>
<th>Education</th>
<th>Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

+Start with the interviewee

4. The house where you live is owned, rented or other?

a. Owned ________

b. Rented ________

c. Other ________

d. Explain if other ________________________________
5. The land that you crop or have with livestock is owned, rented, share cropped or other?
   a. Owned ________
   b. Rented ________
   c. Share Cropped ________
   d. Other ________

6. How much land do you have in crops, livestock or other?
   a. Crops + _______
   b. Livestock _______
   c. Other _______
   d. Total _______
   + Interviewer, convert to Hectares.

7. How much did you spend on groceries last week? $ ___________

8. Did you pay for the groceries by cash, by credit, or both?
   a. Cash _______
   b. Credit _______
   c. Both _______

9. What is your main source of income? ___________________________

10. What other sources of income do you have during the year? (probe)

   ___________________________________________________________

   KNOWLEDGE

11. What do you understand by fertilizer? _______________________

12. What do you understand by vaccine? _______________________

13. What do you understand by improved seed? ___________________

   ___________________________________________________________

14. What do you understand by the extension service? ____________

   ___________________________________________________________

15. From whom do you get advice when you have a problem (insect, disease, etc.) in your crops?

   ___________________________________________________________
16. From whom do you get advice when you have a sick animal?

17. What person(s) do you know from ICA (sec., Fed.)?

18. Do you know what the Secretariat of Agriculture does?

19. Do you know what ICA does?

20. Do you know what the Coffee Growers Federation does?

CONTACT WITH EXTENSION

21. In June and July how many times have you been visited by ICA (Fed., Secr.) personnel because you asked them to do it? #

22. In June and July how many times have you been visited by ICA (Fed., Secr.) personnel in your farm without asking it? #

23. In June and July how many times have you visited the office of ICA (Fed., Secr.)? #

24. In June and July how many times have you been in meetings or field days with ICA (Fed., Secr.) personnel? #

25. In June and July how many times have you talked with ICA (Fed., Secr.) personnel anywhere, other than office and your farm? #

26. In June and July how many times have you received information from ICA (Fed., Secr.) personnel through another farmer? #
PRACTICES

27. Have you tried to increase the yield of your crops?
   Yes ________
   No ________

28. (If not) Why have you not tried to increase the yield of your crops?
   ____________________________________________________

29. (If yes) What have you done to increase the yield of your crops?
   ____________________________________________________

30. What practices or knowledge have you learned from ICA personnel for your farm?
   ____________________________________________________

31. Which one(s) of those practices or knowledge have you used in your farm?
   ____________________________________________________

32. Do you consider that the practices used have increased, decreased or left your yields the same?
   __________________
   
   a. increased ________
   b. decreased ________
   c. same ________
   d. one's yes, other no ________
   e. don't know ________

33. Which of the practices or knowledge that you have learned have not used? Why? (probe)
   ____________________________________________________
   ____________________________________________________
CREDIT

34. To whom do you owe money?
   a. nobody ______
   b. relatives ______
   c. friends ______
   d. official agencies ______
   e. others ______

35. Do you think that you need credit for your farm operation?
   Yes ______
   No ______

36. (If he does not have a loan from official agency and he thinks that he needs credit or owes money) Why do you not use official agencies, such as the Agricultural Credit Bank, Incora, etc.?

EXPOSURE TO MASS MEDIA

37. Do you have a radio? Yes _____ No _____
   (If no, go to 40)

38. Do you listen to any farming program? Yes _____ No _____
   Name of program ________________________________

39. What other(s) programs do you listen to?
   ________________________________

40. Have you read any newspaper in the last four weeks? Yes _____ No _____

41. (If yes) Which newspaper(s) did you read?
   ________________________________
42. How often do you go to town?
   a. Two or more times a week
   b. Once a week
   c. Every 15 days
   d. Every month
   e. Other

43. Have you gone to Medellin? Yes No

44. (If yes) When was the last time you went to Medellin?
   a. This week
   b. Last week
   c. 15 days ago
   d. A month ago
   e. 6 months ago
   f. A year ago
   g. More than a year ago

PERCEPTION

I am going to read several statements, one by one, about the work of the extension agent and the extension service of ICA (Fed., Secr.) for you to give to me your opinion. Each one has five possible answers and you should choose the one which describes best in your opinion the statement. The possible answers are: strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1).

After reading each statement, ask: do you strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1)?
45. * The recommendations from personnel of ICA (Fed., Secr.) are not suited to your farm? X X X X X
46. * The personnel from ICA (Fed., Secr.) uses words (things) you do not understand? X X X X X
47. * The personnel from ICA (Fed., Secr.) do not have enough experience to be able to teach? X X X X X
48. ICA (Fed., Secr.) personnel should not tell you how to crop (do things)? X X X X X
49. ICA (Fed., Secr.) personnel go by the book and not by what is happening in the field? X X X X X
50. Sometimes ICA (Fed., Secr.) personnel are not too sure about what they are advising or recommending? X X X X X
51. * ICA (Fed., Secr.) personnel have always done what they have promised? X X X X X
52. * You once did what the personnel from ICA (Fed., Secr.) suggested and it was a failure? X X X X X
53. ICA (Fed., Secr.) personnel teach you how to do things? X X X X X
54. * What ICA (Fed., Secr.) personnel teach can only be done by rich people? X X X X X
55. * You are unhappy with the Extension Service? X X X X X
56. * The Extension Service needs more personnel in order for farmers to be able to improve? X X X X X
57. * The farmers have benefited from the Extension Service? X X X X X
58. * You would like to see the Extension Service suspended because it is good for nothing? X X X X X
59. Extension works with all farmers or campesinos? X X X X X
60. What extension does is good for farmers? X X X X X
61. The work of Extension is to teach new agricultural techniques? X X X X X
62. The Extension Service can help you very little to get rid of your poverty? X X X X X
63. The Extension Service is not good because everything depends on "God"? X X X X X
64. * Extension based on talking is null? X X X X X

*Statements that exhibit consistent discrimination effects, being significant at the 5 per cent level by comparison of extreme quartiles of 17 interviews made at the Municipio of Peñol.
### APPENDIX B

**Extension Agencies of ICA in Antioquia Work Fronts, Number of Clients Assisted and Clients Interviewed, August, 1971.**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Work Fronts</th>
<th>Clients</th>
<th>Interviews Made</th>
<th>Number of Farms Per Municipio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urrao</td>
<td>Orobugo</td>
<td>44</td>
<td>18</td>
<td>4,609</td>
</tr>
<tr>
<td></td>
<td>La Cartagina</td>
<td>37</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pavon</td>
<td>116</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>El Salado</td>
<td>151</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sabanas</td>
<td>98</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Frontino</td>
<td>Las Cruces</td>
<td>63</td>
<td>-</td>
<td>1,963</td>
</tr>
<tr>
<td></td>
<td>Manguruma</td>
<td>120</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>El Chuscal</td>
<td>78</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Musinga</td>
<td>64</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Sonson</td>
<td>Alto Sabanas</td>
<td>183</td>
<td>14</td>
<td>4,609</td>
</tr>
<tr>
<td></td>
<td>Llanadas</td>
<td>152</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Roblalito</td>
<td>90</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sirugua</td>
<td>89</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tasajo</td>
<td>116</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>1,401</td>
<td>136</td>
<td>12,909</td>
</tr>
</tbody>
</table>

1 Data presented was drawn from DANE, Censo Nacional Aguropcuario 1970, Resumen Departamental, Datos Provisionales.
APPENDIX C

Extension Agencies of Coffee Federation in Antioquia, Number of Municipalios Covered, and Number of Clients Assisted, Colombia, July, 1971

<table>
<thead>
<tr>
<th>Extension Agency</th>
<th>Municipalios Included in Agency</th>
<th>Clients Assisted</th>
<th>Number Coffee Farms Per Agency^1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andes</td>
<td>3</td>
<td>752</td>
<td>3,522</td>
</tr>
<tr>
<td>Fredonia</td>
<td>5</td>
<td>450</td>
<td>3,091</td>
</tr>
<tr>
<td>Jerico</td>
<td>6</td>
<td>676</td>
<td>3,533</td>
</tr>
<tr>
<td>Medellin^2</td>
<td>15</td>
<td>684</td>
<td>9,742</td>
</tr>
<tr>
<td>Occidente</td>
<td>19</td>
<td>580</td>
<td>10,520</td>
</tr>
<tr>
<td>Oriente^2</td>
<td>13</td>
<td>1,217</td>
<td>6,863</td>
</tr>
<tr>
<td>Salgar^2</td>
<td>4</td>
<td>658</td>
<td>3,069</td>
</tr>
<tr>
<td>Sonson</td>
<td>5</td>
<td>563</td>
<td>5,702</td>
</tr>
</tbody>
</table>

TOTAL 70 5,580 46,042

^1Based on data from coffee census 1970

^2Extension agencies where interviews were made.
APPENDIX D

Extension Agencies of Coffee Growers Federation in Antioquia Where Interviews Were Made, Number of Clients Assisted and Clients Interviewed, Colombia, September 1971.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Work Front</th>
<th>Clients</th>
<th>Interviews Made</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medellin</td>
<td>1) Armenia y Heliconia</td>
<td>92</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>2) Sta. Barbara</td>
<td>127</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>3) Ebejico, San</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jeronimo, Sopetran</td>
<td>232</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>4) Valle Aburra</td>
<td>222</td>
<td>-</td>
</tr>
<tr>
<td>Oriente (Nordeste)</td>
<td>1) Guadalupe</td>
<td>116</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>2) Yolombo</td>
<td>130</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>3) San Rafael</td>
<td>206</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>4) Cocorna</td>
<td>209</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>5) San Roque</td>
<td>354</td>
<td></td>
</tr>
<tr>
<td>Salgar</td>
<td>1) Barroso I</td>
<td>142</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>2) Barroso II</td>
<td>101</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>3) Bolivar-arriba</td>
<td>125</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>4) Concordia</td>
<td>103</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>5) Betulia</td>
<td>144</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>6) Bolivar-centro</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>2,128</strong></td>
<td><strong>127</strong></td>
</tr>
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</table>
APPENDIX E

Extension Agencies of Secretariat of Agriculture of Antioquia, Centers, Sub-Offices of Regional Centers, and Experimental Nucleos, Colombia, September 1971

<table>
<thead>
<tr>
<th>Centers</th>
<th>Sub-Offices</th>
<th>Exp. Nucleos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chigorodo</td>
<td>Turbo</td>
<td>Necocli</td>
</tr>
<tr>
<td>Antioquia</td>
<td>Sopetran</td>
<td>Dabeiba</td>
</tr>
<tr>
<td></td>
<td>Canas Gordas</td>
<td></td>
</tr>
<tr>
<td>Andes</td>
<td>Tamesis</td>
<td></td>
</tr>
<tr>
<td>Rionegro</td>
<td>Abejorral</td>
<td>San Luis</td>
</tr>
<tr>
<td></td>
<td>Sonson</td>
<td></td>
</tr>
<tr>
<td></td>
<td>La Union</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Granada</td>
<td></td>
</tr>
<tr>
<td></td>
<td>San Carlos</td>
<td></td>
</tr>
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<td>Cisneros</td>
<td>Guadalupe</td>
<td>Carolina</td>
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<tr>
<td></td>
<td>Yali</td>
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</tr>
<tr>
<td>Yarumal</td>
<td>Entrerrios</td>
<td>Ituango</td>
</tr>
<tr>
<td></td>
<td>Santa Rosa</td>
<td></td>
</tr>
<tr>
<td></td>
<td>San Pedro</td>
<td></td>
</tr>
<tr>
<td>Caucasia</td>
<td>Zaragosa</td>
<td>Segovia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Caceres</td>
</tr>
<tr>
<td>Puerto Berrio</td>
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<td>Casabe</td>
</tr>
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</table>

1Extension Agencies eligible for interviews.
APPENDIX F


<table>
<thead>
<tr>
<th>Agency</th>
<th>Work Front</th>
<th>Clients</th>
<th>Interviews Made</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rionegro</td>
<td>Marinilla</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Santuario</td>
<td>150</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Rionegro</td>
<td>41</td>
<td>4</td>
</tr>
<tr>
<td>La Union</td>
<td>La Union</td>
<td>96</td>
<td>14</td>
</tr>
<tr>
<td>Ituango</td>
<td>Ituango</td>
<td>57</td>
<td>-</td>
</tr>
<tr>
<td>Pto. Berrio</td>
<td>Puerto Berrio</td>
<td>53</td>
<td>2</td>
</tr>
<tr>
<td>San Pedro</td>
<td>San Pedro</td>
<td>230</td>
<td>15</td>
</tr>
<tr>
<td>Yarumal</td>
<td>Yarumal</td>
<td>24</td>
<td>5</td>
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<td></td>
<td>Campamento</td>
<td>29</td>
<td>2</td>
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<td>Entererrios</td>
<td>Enterrios</td>
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<td>-</td>
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<td>Canasgordas</td>
<td>Canasgordas</td>
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<td>14</td>
</tr>
<tr>
<td>Sopetran</td>
<td>Sopetran</td>
<td>38</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>San Jeronimo</td>
<td>43</td>
<td>5</td>
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<tr>
<td>Antioquia</td>
<td>Antioquia</td>
<td>74</td>
<td>13</td>
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</tbody>
</table>

**TOTAL** 1,007 107

1Number of clients based on lists sent by agencies on request of the Director and Assistant of the Operations Division, Secretariat of Agriculture. The lists included some clients who were repeated two or three times, and some who had already died or sold their farms.
VITA
VITA

Fabio Zapata Ll. the older of eight children of Ramon Zapata and Maria Llano de Zapata, was born on November 26, 1938, in Rionegro, Antioquia, Colombia. His early life was spent on the family farm in Rionegro.

He completed high school under the "Liceo Jose Maria Cordoba" in Rionegro in November, 1957. He entered the School of Agriculture at the National University in January, 1958 and completed his course work in November 1962, receiving the degree of Inginiero Agronomo in April 1965.

Upon finishing college work, he was employed in the Department of Agricultural Research, today ICA, as Supervisor of the National Center of Agricultural Research, "Tibaitata", until July 1965. He went to Oregon State University for graduate work and received the M.S. in June, 1967. He went back to Colombia and was appointed Director of the National Center of Agricultural Research, "Nataima", until November, 1968, when he resigned from ICA and went to work with the National University's School of Agriculture at Medellin. From here he was awarded a W. K. Kellogg Foundation Fellowship for advanced training in Extension Administration at Louisiana State University.
The author married Maria Isabel Rodriguez, October 18, 1968. They have one daughter, Sandra Victoria.