PROBLEMS OF GRAPHIC VISUALS IN AGRICULTURAL INFORMATION AMONG FARMERS IN RURAL AREAS OF ZARIA LOCAL GOVERNMENT.

by

SHITTU, ABDULRAIFU AYANSHOLA

A thesis submitted to the Postgraduate School,
Ahmadu Bello University, in partial
fulfilment of the requirements
for the degree of

MASTER OF ARTS (INDUSTRIAL DESIGN)

Department of Industrial Design
Faculty of Environmental Design
Ahmadu Bello University
Zaria

October 1987

DECLARATION

I hereby declare that this project has been composed by myself and is a record of my own research work. It has no bearing to any thesis which has been submitted and accepted for a higher degree. All information derived from materials both published and unpublished by others have been fully acknowledged by references.

Shittu Abdulraifu Ayanshola

CERTIFICATION

This thesis entitled "Problems of graphic Visuals in agricultural information among farmers in rural areas of Zaria L.G.A." written by Shittu, Abdul Raifu Ayanshola, meets the regulations governing the award of the degree of M.A. (Industrial Design) Ahmadu Bello University and it is approved for its contribution to knowledge and literary presentation.

A.A Goals — Date: 30/11/87
Chairman, Supervisory Committee

The Thesis — Date: 9/12/87
Member, Supervisory Committee

Member, Supervisory Committee — Date:

Dr. S.A. Adetoro — Date: 10/12/87
Head of Department

Dean, Postgraduate School — Date: 19-2-88

ACKNOWLEDGMENTS

My profound gratitude goes to my major supervisor, Dr. A. O. Aboderin who unselfishly encouraged me at all times and gave invaluable suggestions throughout this study. He took on my supervision at a time I was facing a crisis; but his foresight and diligent guidance enabled me to forge ahead with the work.

I would like to thank my second supervisor, Dr. Ben Uchegbu of the Institute of Agric. Research, A.B.U., Zaria for his advice and valuable contribution to this research work.

I am especially indebted to Dr. Benjamen Oyejola (formerly of I.A.R., A.B.U., Zaria) for his statistical wisdom and assistance in the computer programming of the data for this study. To Professor Montifa, for his advice.

To Dr. S. A. Adetoro, the Head of the Department of Industrial Design, A.B.U., Zaria, for his many valuable suggestions and constant help, right from the proposal stage. To Dr. J. O. Jegede, Dr. J. P. Voh, Mallam M. B. Zaria, Mr. J. B. Igunnu, Dr. J. T. Arokoyo and Dr. Serrano for their valuable advice on the research design, the questionnaires and other contributions to the contents of this thesis.

I sincerely thank the Acting Director of the Agricultural Extension and Research Liaison Services, A.B.U., Zaria, for granting me permission to pursue this study, and for making it possible for me to get the financial sponsorship of the Institute.

Special thanks go to all the participating farmers, agricultural information officers and staff of A.B.U., Zaria, for their cooperation without which the study would not have been possible. To Baba I. B. Mohammed for translating the questionnaires into Hausa. To Mr. Aliyu Bello, Alhaji Yahaya, Mrs. Matitiya Kaura and Mrs. T. Chile for helping to gather the data for this study. To Mr. Michael Odeh, Mrs. Raji and Alhaji A. A. Yusufu for typing and retyping. I am grateful to Messers Z. Omenesa and Bata Malgwi for the photographic work in this thesis.

My sincere thanks to my dear wife, 'Laitan , for her love, patience and support throughout the period of the study.

A.R.A. Shittu

TABLE OF CONTENTS

	Page
Title page	i
Declaration	ii
Certification	iii
Acknowledgement	iv
Table of contents	vi
List of tables	x
List of figures and plates	xii
Abstract	xiii
CHAPTER	
1. INTRODUCTION	1
1.2. The problem of the study	2
1.3. Objectives	5
1.4. Hypotheses	6
1.5. Background and significance of the study	8
1.6 Definition of terms.....	13
1.7 Assumptions	15
1.8 Delimitations	16
1.9 Limitations	17
1.10 Summary	17
1.11 Chapter references	19
II LITERATURE REVIEW	23
2.1 Introduction	23
2.2 Graphic Visuals	24
2.3 Classifications of visuals	25
2.4 Symbols	32

		Page
2.5.	Colours	31
2.6	Comprehension of visuals	35
2.7	Comprehension and personal characteristics	40
2.8.	Communication models	50
2.9	Graphic visuals in agricultural information	52
2.10	Research methodologies	56
2.11	Summary	57
2.12	Chapter references	59
III	METHODOLOGY	66
3.1	Questionnaires	66
3.2.	Measurements	67
3.3	Variables and how they were operationalised	68
3.4	Description and classification of test materials	71
3.5	Interviewer training	89
3.6.	Sample population	91
3.7	Administering the main questionnaires	93
3.8	Secondary interviews	94
3.9	Operational hypotheses	96
3.10	How data was analysed	97
3.11	Summary	100
3.12	Chapter references	102
IV	PRESENTATION AND ANALYSES OF DATA	104
4.1	Rural respondents Characteristics ..	104
4.2	Exposure	106
4.3	Comprehension	107

		Page
4.4	Visual categories and comprehension	112
4.5	Exposure and comprehension	113
4.6	Preference	114
4.7	Agricultural information personnels' responses.....	119
4.8	Communication specialists responses	120
4.9	Aesthetics and comprehension	121
4.10	Personal characteristics and comprehension	123
4.11	Literacy and formats	125
4.12	Personal characteristics and preference.....	127
4.13	Problems of design	128
4.14	Use of extension visuals	133
4.15	Exposure and occupation	136
4.16	What rural respondents do with the information	137
4.17	Attitudes towards the visuals	138
4.18	Chapter references	143
V	SUMMARY OF FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH	145
5.1	Summary	145
5.2	Findings on comprehension	146
5.3	Characteristics and comprehension...	147
5.4	Findings on preferences	148
5.5	Findings on problems of design	149
5.6	Findings on use	150
5.7	Conclusions	152

Page

5.8. Implications 154

5.9. Recommendations for future research 157

REFERENCES 159

Appendix A: Questionnaire for rural respondents 166

Appendix B: Agricultural information personnels' questionnaire 182

Appendix C: Communication specialists' assessment sheets 185

Appendix D: Letters from the Department of Industrial Design 187

Appendix E: Letter of permission from Zaria, L.G.A. 189

Appendix F: Visuals 190

Appendix G: Ajami version of leaflet 192

LIST OF TABLES

Table		Pages
1.	Rural respondents' age groups	105
2.	Occupational categories	105
3.	Literacy levels	106
4.	Responses to: "Have you seen or read extension publications before?"	107
5.	Publications recieved	107
6.	Comprehension test scores	109
7.	Symbols comprehension	110
8.	Relationship between symbols comprehension and exposure.....	111
9.	Relationship between visuals and symbols' comprehension	112
10.	Relationship between visuals' comprehension and exposure	113
11.	Preferences per location	115
12.	"Best liked" and most "naturalistic/ realistic" visuals chosen by rural respondents	116
13.	Preference and comprehension	118
14.	Proportions giving particular reasons for preferences.	118
15.	Agricultural information personnels' assessment of some visuals	119
16.	Agricultural information personnels' general assessment	120
17.	Communication specialists' socres	121
18.	Relationship between comprehension and aesthetics	122
19.	Relationship between poster comprehension and personal characteristics	124

		Page
20.	Relationship between leaflet comprehension and personal characteristics	125
21.	Visual category comprehension and literacy levels	126
22.	Visual category comprehension and occupational categories	127
23.	Relationship between preferences and personal characteristics	123
24.	Frequency distribution of responses to ... perception and interpretation test statements	129
25.	Places rural respondents were exposed, and situations in which agricultural information personnel used extension visuals	134
26.	Visuals respondents' saw and read	136
27.	Relationship between exposures and occupation categories	137
28.	What rural respondents do with the visuals	138
29.	Rural respondents' use of the information	138
30.	Opinions expressed by rural respondents ..	140
31.	Comments of rural respondents	141
32.	Needs rural respondents mentioned in their general comments	142

LIST OF FIGURES AND PLATES

		Pages
Figures:		
1.1.	Production of extension visuals	10
2.1.	Deregowski's test picture	48
2.2.	A framework of the relationship between the variables in the communication process	51
Plates:		
I.	Dress seeds with Aldrex "T" poster	73
II.	Agric. Cooperative Bank Loan	74
III.	Raise rabbits poster	74
IV.	Grain storage leaflet	75
V.	Guineacorn production leaflet	76
VI.	Citrus leaflet	77
VII.	Control poultry diseases poster	79
VIII.	Agric. Cooperatives	80
IX.	Groundnut diseases control	81
X.	Format for illiterates	82
XI.	Select best millet heads	83
XII.	Apply fertilizer to guineacorn farm	85
XIII.	Balanced diet poster	85
XIV.	Hybrid maize poster	86
XV.	Rabbit raising leaflet	87
XVI.	Black and white symbols	90
XVII.	Coloured symbols	91

ABSTRACT

Shittu, Abdul Raifu Ayansholas
Problems of Graphic Visuals in Agricultural Information, Among Farmers in Rural Areas of Zaria L.G.A. Master of Arts in Industrial Design; July 1987, 192 pages, 32 tables, 21 photographs, 76 reference titles

The problem of this study lies in the factors associated with the comprehension and use of agricultural extension graphic visuals in agricultural information, for better agricultural production in rural areas. Previous studies in our environmentare scanty. Results indicate that farmers do not understand the message of the graphic visuals. Visual perception studies done elsewhere in Africa revealed that rural people tend to misunderstand three-dimension cues in pictures, accented and symbolic drawings, and sequential representations. Understanding appeared to be associated with educational attainment, prior experience and styles of representation. The problems of use were: the irrelevance of the message and non-use of the supplied visuals.

The objectives of this study were to determine: (a) the extent of comprehension, preferences, and use of the graphic visuals, (b) the relationship between comprehension and respondents' personal characteristics and (c) to document the problems of the visuals, as well as suggest alternative design concepts.

Data was gathered through interviewing 165 people randomly selected from five villages in Zaria Local Government Area. They responded to a structured questionnaire including 15 test extension visuals. Further, agricultural information personnel who participated in Agricultural Information Workshops in A.E.R.L.S. in 1984 and 1985, were interviewed. Other supplementary methods were: personal observations, and communication specialists' rating of selected A.E.R.L.S. extension visuals. Communication specialists are graduate graphic staff of A.B.U., Zaria having at least five years experience. Data was analysed by percentage frequency distribution, Chi-square, Spearman's correlation as well as Goodman and Kruskal's Tau were used to verify the relationships between the variables of the study.

From the analyses, the following conclusions were drawn:

(1) Majority of rural respondents understood the extension graphic visuals. The naturalistic/realistic pictorial category seems the highest understood, and also

the most preferred. Aesthetics and simplicity of design, were found to be associated with comprehension.

(2) A high rate of literacy as well as farm experience level were found to be statistically, significantly related to comprehension.

(3) Problems of the visuals are associated with the following factors: lack of emphasis in message design, difficult captions, pictorial representation that does not properly identify message and busy contents,

(4) The extension visuals are not distributed to reach farmers in their villages. Exposure is low.

(5) Respondents showed positive attitude towards, and expressed need for the extension visuals.

Based on the analysis, limited information type pictorial representations can convey messages to farmers. Naturalistic-realistic visuals should be used for emphasis. The visuals should be aesthetically pleasing and carry only relevant messages. Alternative distribution channels suggested are: (1) Local Government Secretariats, adult literacy establishments, and youth clubs. (2) Pictorial agricultural messages should be carried on farm input packages (e.g. fertilizer bags). The extension posters need popularising through the radio and television. These would increase the number of farmers reached with agricultural information.

CHAPTER I

1.1. INTRODUCTION

The Agricultural Extension and Research Liaison Services (A.E.R.L.S.), A.B.U., Zaria, have since its inception in 1963, been producing posters, farmers pictorial leaflets, flipcharts and handbills. These, and other mass media, are used in disseminating results of agricultural research within the Northern States of Nigeria. Yazidu (1973) found that radio was the most popular source through which farmers in the Northern States receive agricultural information. Other sources are posters, films, television and extension workers. According to Ajakaiye (1980), posters and leaflets are aimed at creating awareness and arousing farmers interest to ask questions, even when they cannot read the captions. Sokomba (1977) wrote that publications (including graphic visuals) are important channels for getting agricultural information across to extension workers and to farmers.

Uptill the present time, few studies have been done in our environment, to determine the effectiveness of the visuals. Researches done in East and South Africa, and North America have revealed problems of graphic visuals. Daniels (1966) found that farmers could not understand the message content of posters.

Studies by Collins et al (1979) revealed that abstract symbols were not understood even by literate audience. Ockomba(1977) wrote that: irrelevance of the message content and non-use of the supplied visuals (because of poor distribution facilities), are problems of publications' use in agricultural information dissemination.

1.2. THE PROBLEM OF THE STUDY

The problem of the study lies in the factors associated with the comprehension and use of extension graphic visuals among literate and illiterate farmers in selected villages in Zaria Local Government Area, for better agricultural production.

STATEMENT OF THE PROBLEM

Illiterates have problems understanding pictorial representations and symbols; they cannot interprete and relate together the various depicted objects (or things); as a result they fail to get the message carried by the visuals. Daniels (1966), in a study of the Gusau extension pilot project, found that farmers did not understand the message contents of agricultural extension posters. This was inspite of the fact that they could recognise the objects depicted. Deregowski (1972), in a study of pictorial perception across cultures, concluded that Africans have problems integrating the different pictorial components, into a unified whole. He found that they do not understand: perspective drawings and depth cues. This confirms studies by Hudson (1968) and Duncan et al (1973). Duncan et al (1973) in addition, found that Africans misunderstand shadings, cartoons, and symbols.

Ambiguities inherent in some line drawings, and inaccurate depictions due to artists' poor draughtsmanship, cause misunderstanding by illiterates. These were revealed in a study of recognition of pictorial symbols among rural Kenyans, done by Overseas Visual Aids Centre/Centre for Educational Development Overseas (1969). Subjects were shown line-tonal drawings of animals and objects, and asked to name them. The percentages of correct responses for each drawing were computed. Results showed that "familiar objects" and "emotionally loaded" drawings were understood by majority of respondents. High incidence of misinterpretations were found to be due to ambiguous or faulty representations caused by poor draughtsmanship of the artist.

Simplicity, format, and aesthetics of the design; colour; and styles of picture representation, are other design factors associated with ease of understanding Arnheim(1971) wrote that simplicity makes for easy understanding. Fugglesang (1973) found that simple, single-image posters, without any background drawings, were more easily understood by a higher proportion of Ethiopian 'respondents, than multiple images' posters. However, Deregowski et al (1972) found that rural Africans need plenty details to properly recognise drawings. This tends to contradict the finding on simplicity.

Africans unschooled in western art do not understand perspectives and three dimensional representations, according to Hudson (1960, 1968) and supported by Deregowski (1972) and Duncan et al (1973). According to Deregowski (1972), a flat, non-perspective type (or primitive style) drawings were the most preferred by Zambian unskilled workers. Keppes (1959) wrote that perspective could be altered in any way deemed necessary, or dispensed with altogether, if such will enable messages to be conveyed clearly, in adverts. Hagen (1978) found that perspectives need to be modified "intuitively" by artists to make the representations appear "natural" to viewers. However, Horchberg (1972) maintains that perspectives are necessary to enable proper comprehension by viewers. Therefore, it can be said that what to regard as the correct representation technique is controversial.

Viewers personal characteristics have been found to be associated with understanding. Illiteracy, low exposure to pictorial media, low education and rural location, tend to be associated with low comprehension of visuals. Daniels (1966) concluded that farmers' illiteracy caused their lack of understanding of the poster messages. Duncan et al (1977) and Fugglesang (1973), found that the higher the exposure, the higher the understanding.

On the use of extension graphic visuals in the Northern States of Nigeria, studies by Yazidu (1973) and Arokoyo (1981) tend to show that farmers' use of graphic visuals as an information source is low. However, in a study of the effectiveness of demonstration farms in Minna, Gana (1975) found that circulation of extension leaflets enabled farmers to adopt improved agricultural practices. Daniels (1966) and William (1968) found that posters were used in agricultural information in Gusau district of Sokoto State and Western States of Nigeria, respectively. Defever (1977) and Perraton (1985) wrote that wall charts, posters and leaflets were used in Benin republic and Malawi, respectively, to support extension communications in health and agriculture.

This present study is therefore to investigate: the extent farmers understand and use A.E.R.L.S. extension graphic visuals, and the suitability of different designs, to disseminate agricultural information for better agricultural production.

1.3. OBJECTIVES OF THE STUDY

(1) To find out the extent of farmers understanding of the pictorial contents of each category of extension posters and leaflets, and other visual test items.

(2) To discover the respondents' preferences of the various categories of extension posters and leaflets.

(3) To relate respondents' personal socio-economic characteristics and their understanding of the extension posters and leaflets,

(4) To document problems of the visuals and suggest alternative design concepts for the graphic visuals.

(5) To determine the extent respondents use the information from agricultural extension visuals.

1.4. HYPOTHESES

Each of the following hypotheses are formulated on the categories of test items. They are in line with the objectives of the study.

(1) A significant number of respondents will have high understanding, of and accept naturalistic/realistic type extension visuals, more than limited information type. The rationale for this is based on the theory that Africans understand realistic/naturalistic pictures more than other types which Duncan et al (1973) and Fugglesang (1973) confirmed in their studies in South Africa and Ethiopia respectively.

(2) There will be significant differences in respondents preferences of extension graphic visuals.

The rationale for this is that perception is an individual matter according to Arokoyo (1981); Duncan et al (1973) found that status and education tend to affect preferences for visuals. Gombrich (1972) wrote that since people add from their stock of past experience to what they see, to explain it, several interpretations are possible for a single picture.

(3) Respondents' understanding will be correlated with the graphic visuals' aesthetic level.

Theory leads us to accept the above hypotheses; according to Coony (1978) and Horchberg (1973), aesthetics aid understanding. Also according to Arnheim (1974), "the more orderly the structure and the simpler the order, the more easily does the scanning lead to an image perceived as an organised whole".

(4) Level of comprehension will be significantly related to age, farming experience, occupation, literacy and exposure. Theory tends to support this hypothesis. According to Deregowski (1966) and Duncan et al (1973), education is positively correlated with understanding of pictures. Gombrich (1972) wrote that experience affects the interpretation a person can give to a picture. Further, Duncan et al (1973) and Fugglesang (1973) found that pictorial literacy is related to prior exposure to visuals.

(5) Use will be significantly associated with experience and occupation.

Bogunjoko (1983) found that age, and farming experience was related to use of radio by farmers in Giwa district of Zaria Local Government Area.

1.5. BACKGROUND AND SIGNIFICANCE OF THE STUDY

Agricultural extension in Northern States of Nigeria began with the establishments of Agricultural Research Station and a School of Agriculture, both in Samaru in 1921. The School trained extension workers, who carried research recommendations to farmers in rural areas, according to Ajakaiye (1978) and Arokoyo (1981). Nwerri (1980), wrote that initial communication devices included chalkboard, charts and slides to arouse interest in subjects taught. He reported that agricultural shows, and demonstration farms were mass channels, whose uses began from 1903 and 1910 respectively. According to Yazidu (1973), radio broadcasting of agricultural informations began in 1952.

The then northern Nigeria's Ministry of Agriculture established an agricultural information unit in 1961, with the commencement of the aid agreement between it and the United States Agency for International Development (U.S.A.I.D). The headquarters of the unit was in Samaru, with provincial offices in Gombe and Gusau initially. According to the Extension Information, monthly activity report file, ERLS/REP-11/Vol.I, the unit was staffed by one U.S.A.I.D. communication specialist and some graduates of the school of agriculture. Early activities included production of posters, duplicated handouts, photography and slides and hand drawn pictorial flip-charts, for field workers training.

In 1963, the agricultural information unit became part of the Extension and Research Liaison Services (E.R.L.S.). According to Arokoyo (1981), this was merged with the Institute of Agricultural Research, Samaru in 1968. In 1975, the E.R.L.S. was changed to A.E.R.L.S., and became an autonomous Institute, created by Ahmadu Bello University senate statue. A.E.R.L.S. serves as link between research institutes; and Ministries of Agriculture, agricultural extension workers and farmers.

In 1964, two U.S.A.I.D. communication experts undertook a tour of some provinces in the then Northern Nigeria to access the media needs for communicating with farmers. They found that farmers had problems understanding the extension posters usually displayed on walls in villages. They recommended that more explanatory visuals be used as visual aids by field extension workers in teaching.

Production of A.E.R.L.S. graphic visuals

The production involves inputs from agricultural subject-matter specialist, agricultural communication specialists and graphic artists - (see diagram - . figure 1.1).

Research findings are simplified by agricultural subject-matter specialists in different A.E.R.L.S. departments. The information then go to the Extension Audio-Visuals Department head. Consultations are held between graphic artist and agricultural communication specialists.

These yield specific message contents which the artist uses to produce several rough posters or leaflets etc. These are sent back to the head and the concerned agriculture subject-matter specialist, who criticise, and make ammendments. The various ammendments guide the artist to produce a comprehensive rough, which is subject to approval again by the agricultural specialist. When approved, graphic artists then make the colour separations. The printing is contracted to firms in Zaria or Kaduna. The printed visuals are distributed to states ministries of agriculture and Agricultural Development Projects for distribution to farmers.

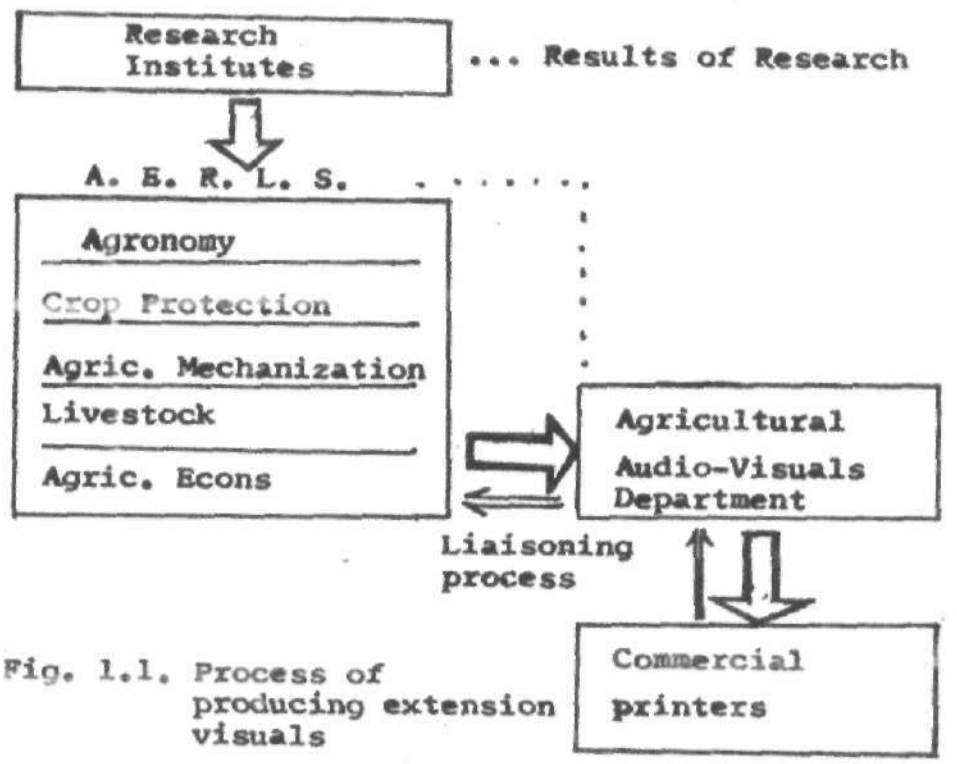


Fig. 1.1. Process of producing extension visuals

The U.S.A.I.D. specialists' report (that farmers have difficulty in understanding extension posters); studies by Daniel (1966), which confirms it, and by Hudson (1960, 1967) and Deregowski (1972), who found

that illiterate Africans cannot understand the message of graphic visuals, point at the need for an investigation of the extent northern states farmers understand different agricultural extension visuals, This motivated the present study. Another source of motivation was the desire to know farmers attitude towards extension graphic visuals. From personal experience, as a staff in A.E.R.L.S., some agricultural specialists and communicators frequently doubt the acceptance by farmers and the need for agricultural visuals, even though they have no proofs.

The major significance of this study have economical, educational and theoretical aspects; these are discussed below:

SIGNIFICANCE OF THE STUDY:

Various Nigerian governments have been pursuing the policy of developing greater agricultural productivity to provide the economic resources for the country's development. One of the channels for realization of this objectives is the agricultural extension system, according to Ajakaiye (1978), and Arokoyo (1984). The system is however, constrained by shortage of extension workers, according to Zaria (1984). Arokoyo (1984) mentioned that the constraint constitutes a gap, stopping useful agricultural information from reaching many farmers. This gap can be bridged by more use of appropriate mass media, (ibid). In order to convey the messages successfully to the farming audience, there's need to

ascertain and create visuals which will be comprehensible and are based on audience knowledge. Adkins (1983) wrote that data from research provides basis for deciding "how to reach the audience, what needs to serve; and how best to achieve message understanding and acceptance------" The present study is aimed at meeting the above need.

Feedback information: This study will provide feedback to the ABRLS and similar organisations; to make visual communication with farmers more effective. According to Baikie (1991); "Not until we know the disposition of the farmers in their understanding and preferences of the media in use, we may never be in a position to introduce stimulating methods in our presentations".

Designers and communication administrators in particular need to keep abreast of new changes in taste and ideas of the public. One of the better ways of doing this is by research, according to Adkins, 1983. Changes in taste and ideas will continue to increase due to expansions in education(and the free education schemes), as well as exposures to communications from outside the country. This means, according to Lakshmana-Rao (1975), that no communicator can base his design decisions on what was true some decades ago, if he is to compete for the attention of the public.

Educational Significance: Additional knowledge on visual perception within the Hausa socio-cultural context will be produced. Results can be exploited to benefit visual communication design curricular in universities, for more relevance to Nigeria's socio-economic growth.

1.5. DEFINITION OF TERMS

Pictures:- refers to any drawing, painting or representation created on a flat surface e.g. paper or cardboard.

Pictorial Content:- refers to the picture(s) and its design in a visual. (as distinct from the captions and copy).

Message content:- the idea or subject matter, encoded in the pictorial content, captions and copy; to be conveyed to the viewer.

Styles of pictorial representations: refers to the different types of drawing, design and painting e.g. cartoons; sketch; out-line only drawings, tromp l'oeil, realism etc.

Representational:- According to Kaupelis (1966), a drawing is representational when attempt is made to achieve a near-likeness to the objects being depicted.

Design:- relating all the elements in a poster (or leaflet) to one another and to the format. Synonymous with composition.

Format:- Layout plan: Nelson (1977) wrote that it is the alotment of spaces, and the interrelationship between the components of a design.

Realistic:- A drawing which depicts objects as they really are; with precision of details.

Accented drawings:- Horchberg (1972) defines accented drawings as line drawings which capture the unique features of a natural object/scene through selection, exaggeration and simplification.

Block-cut:- A single image on a plain background, according to Fugglesang, 1973.

Depth cues:- Drawing conventions, which gives a viewer the illusion of spatial distance and three-dimentionality in pictures, such as linear perspective, overlap, and foreshortening.

Overlap:- In drawings, an object nearest to viewer appears to cover up partially (or in whole) those behind it.

Ajami:- Hausa written with Arabic alphabets.

A.E.R.L.S.:- Agricultural Extension Research and Liaison Services. An arm of Ahmadu Bello University, Zaria, Agricultural Complex.

Extension graphic visuals:- Refers to posters, leaflets, handbills, and flipcharts produced by AERLS., A.B.U., Zaria for extension purposes. It is used interchangeably with extension visuals, extension publications and extension materials.

Perception:- The combining of sensations into the recognition of an object; according to Schiff (1980). It is the process by which people obtain information about the world.

Preference:- Choosing, favouring one visual above another.

Simplicity:- Arnheim (1969) defines simplicity as the minimum number of structural features that will describe a shape; or convey a message to a viewer.

Pictorial literacy:- The ability to understand pictorial representations according to Fugglesang (1973).

Interpersonal communication:- Person to person discussions, gossip, rumours etc., the spread of information through word of mouth.

1.7. ASSUMPTIONS:-

(1) It was assumed that the questionnaire can measure the comprehension of the contents of the visuals.

It was further assumed that the posters and leaflets tested were intended to convey information to literate and illiterate practicing farmers as the primary audience.

(2) That the sample represented the literate and illiterate population of the rural hausa indegenes who use extension graphic visuals. It is assumed that the homogenuity of the indegenous hausa population should make the study applicable to the whole hausa speaking areas.

(3) It is also assumed that respondents gave information which reflect their true situations.

1.8. DELIMITATIONS AND SCOPE OF THE STUDY

The survey location was limited to selected villages in Zaria Local Government area in Kaduna state. This was to ensure a selection that will enable the study to be properly managed. An additional reason was the limited resources and time available for the study. Only A.E.R.L.S. extension visuals were tested to control on variation of production methods.

The study focuses on the pictorial content of the extension visuals. The number of visuals in each classification used in this study was not uniform since the selection was based on available A.E.R.L.S. extension visuals.

Consideration of farmers adoption rate and innovation are outside the scope of this study. Similarly methods and effects of instructional films, television, agricultural shows, and campaigns are excluded.

The sample was made up of mainly male farmers. Zaria (1984), wrote that majority of farmers in the study area are males.

Large scale farmers and those with post-secondary education are excluded, since the visuals are directed primarily to illiterate and semi-literate rural farmers.

1.9. LIMITATIONS

The group method of interviews was used due to insufficient test materials. It is assumed that respondents did not influence each other during the interviewing.

The study will also be affected by biases common to survey studies such as interviewer and respondents biases. For instance, respondents were asked to recall visuals they saw/read prior to the interviewing time, it is assumed they could recall such correctly.

1.10 SUMMARY

This chapter dealt with the problem and objectives of the study.

It gave a historical sketch of agricultural information, and production of agricultural extension visuals in the northern states. Factors affecting comprehension and utilization of visuals were introduced. Detailed reviews of these issues, from past researches follows in chapter II.

Chapter III defines the respondents, describes the survey instruments and interview procedures. The operational forms of the research variables and hypotheses, the test materials as well as, the whole research design were given.

Chapter IV contains the procedures for the analysis and the treatment of data collected with structured questionnaire and extension graphic visuals.

Chapter V gives a summary of the study; findings on: comprehension, preferences, design factors, uses and their relationships with respondents characteristics; conclusions; and recommendations for future research based upon the investigation.

1.11. REFERENCES

Adkins, Gale, R.(1983). "Formative Evaluation in Educational Radio and Television. A fundamental need in Developing countries". Development Communication Report, No. 44, Dec., 1983 Pp.3, 13-14.

Ajakaiye, M.B.(1978) "Problems of Extension in Agriculture, Forestry, Livestock and Home Econs." Paper delivered at the National Seminar on Transfer of Research results. N.S.T.D.A., Ibadan, November 21-24, 1978 (memeographed).

_____(1980) "The Role of Educational Technology in Agricultural Extension." Paper delivered at the N.A.V.A. Convention,Zaria, Kaduna State. May, 1980 (memeographed).

Arnheim, Rudolf (1969). Visual Thinking, University of California, Berkeley.

_____(1974)"Virtues and Vices of the Visual Media" in Media and Symbols, Olson D.R.(ed), 73rd yearbook of the National Society for the study of Education, Chicago.

Arokoyo, J.T. (1981) "Diffusion and Adoption of Recommended Agricultural Practices Among Farmers in the Ten Northern States of Nigeria," Unpublished Ph.D. Thesis. University of Wisconsin, Madison. P.17.

_____(1984). Personal interview, A.E.R.L.S., A.B.U., Zaria. April and May, 1984.

Baikie Adamu (1981). "Keynote Address at the opening of Agricultural Information Workshop". Agricultural Information Workshop Proceedings, October, 18-23, 1981. AERLS, ABU, Zaria.

Cooney, B(1978). "Illustrators Viewpoint" in The Illustrators Notebook, Lee Kingman (ed), The Horn Book Inc., Boston. P.11-12.

Collins, B.L. and Pierman, B.C. (1979). "Establishing Ways to Decide Whether People Understand Symbols" Industrial Design, July/August, 1979.

Daniels, C.B. (1966) "A case study of knowledge transfer in the Gusau Extension Project, Nigeria," unpublished M.Sc. Thesis., Kansas State University, Manhattan. Pp.79 - 86, 90.

Deregowski, J.B. (1972) "Pictorial perception and Culture" Scientific American. VI.227(5) Nov, 1972, Pp. 82-83.

Deregowski, J.B., (Muldrow, E.S. and Muldrow, W.F. (1972) "Pictorial Recognition in a remote Ethiopian Population", Perception, 1, 1972, Pp.417-425.

Duncan, H.F. (1964?) "Experimental Research Design for evaluating African Reaction to Cartoon Strips". Indiana University, Bloomington, Training Handouts, (n.d.) (memeographed).

Duncan, H.F., Gourlay, N., and Hudson, W. (1973). A study of Pictorial Perception among Bantu and White Primary School Children in South Africa Withwatersrand, University Press. Johannesbourg Pp. 5, 12-16, 43, 44, 125, 153.

E.R.L.S. Extension Information File, Monthly Activity Report, ERLS/REP.11/Vol.1, A.E.R.L.S. archieves.

Fugglesang, Andreas (1973) Applied Communication in Developing Countries. Dag Hammarskjold Foundations, Sweden. Pp. 79, 81-83, 92-121.

Gana, F.S. (1975) "An Evaluation of package Demonstration in villages with and without Field Demonstrations in Minna, Nigeria." Unpublished M.Sc. Thesis Kansas State University, Manhattan P.65.

Gombrich, E.H. (1972), "The Mask and the face: the perception of physiognomic likeness in life and art", Art, Perception and Reality, M. Mandelbaum (ed). John Hopkins University, Baltimore.

Hagen, M.A. (1978), "An outline of an Investigation into the special character of pictures", Modes of perceiving and processing Information, Pick, H.L. and Elliot Saltzman (eds), Lawrence Erlbaum Associates, New Jersey.

Horchberg, Julian E. (1972) "The representation of things and people". Art, Perception and Reality. Maurice Mandelbaum (ed). The Johns Hopkins University, Baltimore, Pp. 72-76.

Hudson, W. (1960, 1967) "The study of the problem of pictorial perception among unaccultured groups" International Jnl. of Psychology 1967, 2, 89-107. cited in Modes of Perceiving and Processing information. Herbert, L. Pick and Lawrence, E. Associates, New Jersey, Pp. 21-37.

Igunnu J.B. (1976) "How Agricultural Extension Information is backstopping the Operation Feed the Nation. "AERLS Newsletter, July 1976, Pp. 11-12.

Kepes, Gyorgy (1959) The Language of Vision, Paul Theobald and Company, Chicago.

Lakshmana-Rao, R.U. (1975) Reports and papers on mass Communication: Lessons from Research. UNESCO, Paris. Pp. 18,27,29. 40-44.

Nelson, Roy Paul (1977). The Design of Advertising Wm. C. Brown Co., Dubuque.

Nwerri, I. (1980) "Agricultural Communication in Nigeria - Inception and Development". Paper presented at the 2nd Annual Workshop of the National Accelerated Food Production Project Communications, Zaria. May, 1980. (memeographed).

Overseas Visual Aids Centre/Centre for Educational Development Overseas. (1969) Visuals symbols Survey. London. Cited in Fugglesang Adreas, Applied Communication in Developing Countries., Dag-Hammarskjold Foundations, Sweden P.81, 83, 84, 86-93.

Schiff Williams (1980) Perception: An Applied Approach. Houghton Mifflin Co., Boston, P.325, 334.

Sokomba, Tsado J. (1977) "Reception, understanding and use of Extension Publications by Extension Workers in Nigeria." Upublished M.Sc. Thesis, University of Wisconson, Madison Pp. 26, 30, 32, 27.

Yazidu, Imrana (1973) "The study of Radio as a means of Communicating Agricultural information to farmers in Northern States of Nigeria". Unpublished M.Sc. Thesis ABU., Zaria Pp. 12, 74, 84.

Zaria, M.B. (1984) "An Evaluation of the National Accelerated Food Production Programme Strategy for increased Sorghum Production in the Zaria L.G.A." Unpublished M.Sc. Thesis, ABU., Zaria Pp. 18.

CHAPTER II

LITERATURE REVIEW

2.1. INTRODUCTION:

The review was based on the following subject areas:

(1) Elements of graphic visual design: design elements of simplicity, aesthetics, draughtsmanship; styles of pictorial representations, poster design and illustration theories. Also factors associated with ease of understanding.

(2) Visual perception studies: These dealt with perception of different pictorial representations, and the ease of understanding them as represented in studies by Horchberg (1970), Arnheim (1969, 1974), Kennedy (1974) and Gombrich (1962, 1974). Also socio-economic characteristics of viewer and pictorial illiteracy were covered.

(3) Agricultural information and the farmer in Northern States of Nigeria, and elsewhere:- studies by Yazidu (1973, 1976); Ajakaiye (1980), Arokoyo (1981) and Zaria (1984) among others, dealt with different extension communication channels utilised by farmers.

2.2. GRAPHIC VISUALS

Posters: An extension poster displays a single agricultural message or idea through pictorial representations. It is characterised by a heavy pictorial representation, with a sentence or two of caption, according to Yazidu (1976) and Ajakaiye (1980). Nelson (1977) wrote that any poster should comprise of three major parts: the pictorial display of the message or products, the caption and a subdued background (where necessary). Feldman (1971) mentioned that the ingredients of a poster include the pictorial, product (idea) and the caption. According to Yazidu (1976), studies have revealed that where people can read the captions, posters are more effective; that single image types catch more attention (than multiple images), and multicoloured, more effective than black and white. He mentioned that posters should be displayed where people congregate frequently to enable a wide audience to be reached (ibid). Sizes of A.E.R.L.S. posters are 45cm by 55cm; but posters vary in sizes reaching up to 8m by 4m.(billboards).

Leaflets:

Is a sequential illustration, of the step-by-step method of performing an agricultural operation, e.g. "how to grow hybrid maize". According to Ajakaiye (1980), each illustration is accompanied by a brief sentence

to explain the process. The leaflets were designed to carry more details and supplement posters. Illiterates and semi-literate farmers are the main audience. The size of the leaflet is 29cm by 20.5cm and has four pages.

2.3. CLASSIFICATIONS OF GRAPHIC VISUALS

Nelson (1977) wrote that graphic visuals vary according to their pictorial representations, purpose of message, subject/theme and production requirements.

2.3.1. THE PICTURE CONTENT:

Pictures, according to Arnheim (1969) are drawn images which potray things in a more abstract way than real, natural objects. Kennedy (1974), wrote that a representational picture: repeats the optical forms (or structures) found in the features of an ordinary environment. The forms must be potrayed "in ways that are spontaneously meaningful" to the viewer.

Sigel (1978), wrote that pictures can be classified according to: (1) amount of details or degree of simplicity or complexity , (2) the degree of resemblance to the natural object or scene - whether naturalistic - realistic or abstract; (3) spatial depth representation, whether flat or possess illusion of three dimension, (4) format, (5) theme/message (6) level of aesthetics - whether high or low.

Extent of resemblance to the real object:

Ryan and Swartz (1950) categorised pictures as follows:- cartoons, outline-only drawings (traced from a photograph), shaded/tonal drawings, and photographs, (black and white). The classification was used in a study to determine the one that was most easily comprehended. Comprehension was defined as the speed by which respondents correctly identified relative parts of the layouts. The results showed that the easiest to comprehend was cartoon-type; second, black/white photographs, then shaded drawings, and lastly outline-only drawings. This, according to Kennedy (1974), indicated that detailed realistic pictures are not necessary to convey specific information to viewers. This have been confirmed by Horchberg (1972), and Schiff (1980).

Pictorial representations may be grouped into two broad classes. These are: naturalistic-realistic and 'limited information' types. Schiff(1980) listed the following under the first type: photographs, shaded/tonal drawings, trompe l'oeil, etc; these display maximum resemblance to the objects they represent. Background features to potray natural settings, are also added. Here shadings/tones are used to model forms.

Geometric perspectives and other depth cues are used.

The limited information type includes 'accented' drawings, all-outline drawings, silhouettes, sketches, single-image drawings and cartoons. These drawings have a lot of simplicity. According to Horchberg (1970) and Schiff (1980), limited information representations display only essential, unique features, main contours and directions of the structures, of the natural objects. Arnheim (1974) wrote that for precise realistic details, photographic images are poorer than graphical drawings. Outlines show proper boundaries between objects making identification easier. Also, according to him, these partly abstracted images are better in that they enable the viewer to grasp the essential characteristics of objects or scenes depicted, thus facilitating learning. They aid learning because "learning means grasping the essential characteristics of a situation"(ibid).

Three-dimension representation

In the naturalistic-realistic type, linear and spatial perspective, foreshortening, and overlap, are employed to give the illusion of three dimension. Studies by Hudson (1960, 1966), Deregowski (1972) and Duncan et al (1973) have revealed that Africans have problems interpreting perspectives and other depth cues.

Duncan (1964), Duncan et al (1973) and Fugglesang (1973) suggested that depth cues should be simplified and views of presenting pictures should show the objects in easily understandable ways. Horchberg (1972) wrote that one way of achieving easy understanding is by presenting only the most unique features. Arnheim (1973) suggested elimination of extreme close-ups, as well as use of complete forms. Kepes (1959) wrote that perspectives could be altered to reveal hidden features and relationships among elements in pictures if such will enhance viewers understanding.

In a study to determine the perception of different perspective representations, Hagen (1978) found that respondents gave wrong interpretations to traditional, correct, geometric perspectives. The perspective appeared 'incorrect' to them. Instead a nongeometric, approximate perspective, was interpreted as most correct. Hagen (1978) concluded that artists should modify perspectives "intuitively", to make pictures look more natural to viewers.

Format: Visuals could vary according to format. In this study, the following types are relevant:- (a) Block-out (or single image) type:- defined by Fugglesang (1973) as an image, placed on an empty, plain ground, with all background features removed.

(b) Multiple panel format: as used by Nelson (1977), multipanel type displays images in two or more rectangular panels, atimes with captions placed beneath each. Included in this category are the chart-type and collage-type designs.

Aesthetic factors- Kaupelis (1966) defines aesthetics as "expression given tangible and organised form". The aesthetic component of a design includes those design factors that make it unique and expressive. Expressiveness encompasses the artist's personal manner of expression, and the subtle, sensory qualities felt by the viewer, according to Lupchick and Henrich's (1981). Factors affecting aesthetics include logical and good organisation, novelty (uniqueness), clarity of content; simplicity and unity. According to Arnheim (1971), "the more orderly the structure and the simpler the order, the more easily does the scanning lead to an image percieved as an organised whole". He further wrote that in other to elicit audiences' reaction, a visual should "possess novelty" and be capable of arousing "a sense of wonder in the viewer". Gombrich (1974) wrote that though attempts at expressiveness may lead to ambiguities, the novelty (or surprisingness) of a picture aids remembrance, attracts attention and arouses curiousity thus enabling advertisers to attract potential customers.

According to Feldman (1971), simplicity and logic are the two ingredients of a successful poster. Logic is the connectedness among the elements (lines, shapes, product, image, etc.) to create an "innovative, and stimulating" visual, that can easily be understood by the audience. The above ideas tend to indicate that high aesthetic visuals are easier to understand, and are more effective in conveying ideas.

Aesthetic creativity of designers are impeded when they are subjected to dictations from non-artists; while independent design decisions by artist favour creativity, according to Nelson (1977) and Aboderin (1978). Williams (1957) wrote that the aim of posters is not to win art awards, but artists should insist on aesthetic pleasingness in designing posters; they should not be dictated to,, by administrators. However, if aesthetic creativity overpowers clarity of the message of visuals, communication becomes hampered. According to Gombrich (1974), art cannot replace communication and if it does, communication will fail. Arnheim (1974) suggests that graphic arts for educative visuals should concetrate on elucidating those features that will make the audience learn the appropriate facts. He claimed that artistic "fashion style, originality of invention" and individuality, may in many cases be "fatal to the educational purpose", and recommends that good draughtsmanship should mean: using artistic

expression and style to depict what the client dictates.

It would appear, from the above discussions, that the extent to which aesthetics may be embodiedin design extension visuals will be limited, but the issue seems controvercial. Agricultural extension visuals' message content is subject to dictates of agricultural specialists, should be educative, simple, easy to understand, and must depend on audiences knowledge, and purpose of communication (from personal experience).

2.3.2. PURPOSE OF COMMUNICATION:

Extension visuals could serve to entertain, motivate, instruct or create awareness, according to Thapur (1958). On the above basis two categories can be deduced, as follows:- (a) motivation, and (b) instructional types. Motivation types: are designed to inspire people, to choose a course of action but without giving any specific guidelines of'how to'. The picture content may be humorous and of varied aesthetic design treatments; to create 'effects' and to arouse viewer's curiosity. Instructional type: depicts a technique, farm operations or stages in carrying out an agricultural activity. Most A.E.R.L.S. leaflets are instructional types.

Effect of familiarity: Omari and McGinitie (1974) found that where the pictorial content display familiar objects,

viwers had higher comprehension than when unfamiliar ones were represented. To control against the variable of familiarity in the present study, the selected visual test materials were those dealing with subjects familiar to the population of Zaria Local Government area.

2.4. SYMBOLS

Arnheim (1969) defines a symbol as an image which potrays ideas or things at a higher level of abstractness than itself. Gombrich (1972) states that a visual representation (or image) is not merely a copy of real life, but a symbol system. A symbol can be representational or abstract or may combine the two features. As an example, a representation of a maize plant is a picture. On a higher level, it can be used as a symbol of agriculture, or development. A pictorial representation differs from a symbol, in that pictures should be spontaneously meaningful to viewers, whereas symbols are not, they have to be learnt, according to Kennedy (1974).

Studies by Collins and Pierman, (1979) confirm the above. They tested safety symbols intended for a public building in America. The abstract symbols denote escape routes, danger signs, etc. Respondents included samples from hotels, old peoples homes and University hostels. The symbols were shown one at a time to each respondent, who then wrote down the message or "I don't know".

Responses were scored "correct","incorrect" and "no response" by a panel of three. Agreement between any two judges is needed before any response is accepted as correct. Results show that more than 75%, misunderstood five out of the seven symbols. The conclusion of the study was that symbols for use in the public, should be properly tested; and a large scale education of the public on their meanings, should be done before they are put into use.

Studies by Zimmerman and Steckel (1985) revealed that the symbol "X", a sign used in denoting "wrong", "no", "don't", were not understood by illiterate audiences. The study tested a poster bearing a picture of several dangerous drugs on which a large "X" symbol, in red, was superimposed. A group of pregnant women, to whom the message was directed, were interviewed, to determine if they could understand. The results revealed they could not, and that respondents gave meanings directly opposite to that intended. One of such was that all the drugs should be taken.

The problems of denoting passage of time as in 'wait till after two heavy rainfalls before planting' or 'wait for five minutes, etc, have been reported by Zimmerman and Steckel (1985).

The solution they found, was to observe the routine activities and habits of rural populations, and then selected traditional activities which lasted the same time duration as those to be depicted. After this, another task was to find those that can be represented graphically.

Symbols in extension visuals:- Pictorial symbols are frequently used in extension visuals. Relevant ones are as follows:- (a) fertile soil, represented by brown coloured soil or good plant; (b) water - by blue colour and wavy lines; (c) fertilizer by bag, or a mass of tiny dots; (d) wealth (or riches) by a person holding bag of money; (e) fire - by red flames with grey or black smoke, and the convetional form, and (f) weeds - by grass - a pattern of short upright lines.

2.5. COLOURS

Various studies reveal that colours attract attention, have psychological effects on viewer, as well as aid their understanding. Kepes (1959) wrote that colours generate qualities of feeling and is capable of affecting emotions of beholder. According to him, these effects originate in associations, in the "neuromuscular process", and "dominant other sensations" from the objects seen (ibid). East (1952) and Nelson (1977) mentioned studies done in America which revealed that colour attracts more attention,

and affects the viewer's emotion more than black and whites. However, according to East (1952) both monochromatic and multicoloured visuals have been found to have the same capacity to aid memory retention. Nelson (1977) wrote that colours tend to make for faster and easier understanding of adverts. Bulloughs (1978) mentioned that research has shown that contrasting colours catch more attention; and that the older a child grows, the less he is interested in coloured visuals. According to Schiff(1980), studies with children have shown that lettering in black on a white background was more visible than any other combination and the worst combinations include: white on yellow, and blue on black backgrounds.

Nelson (1977) wrote that studies by American Newspaper Publishers Association, revealed that the addition of one colour in a newspaper advert was responsible for 50 percent additional sales than black and white adverts. Similarly three colours generated 70 percent more sales.

Wober found that images of Negro race, depicting typical Negro hair and facial features, were not recognised by a sample of Nigerian unskilled workers, according to Duncan et al (1973). The study revealed that if the picture had been depicted with black skin, the respondents would have understood better.

Aboderin (1978) wrote that colours should be used symbolically; they should contribute with other design elements, to convey the message to readers. According to Nelson (1977), colour symbols are arbitrary conventions derived from association, and had become accepted over time, with use. Some are from observable facts. However, they, like other symbols, need to be learnt. Some of the relevant ideas that have been symbolised are as follows:- (a) Blue - gives the feeling of cold, cool, peace and refreshing (b) Reds - reaching out, advancing, warmth, and fire (c) Green - growth, farming, plants, agriculture and renewal (d) Brown - soil fertility (e) Black - may denote evil and death. (ibid).

From the above reviews on symbols and colours, one can draw the following conclusions:- (i) that non-literates will understand straightforward representational, rather than abstract symbols; and (ii) they will prefer and understand multicoloured, more than black and white visuals.

2.6. COMPREHENSION OF VISUALS

Sigel (1978) defined comprehension as the ability to understand the message (agricultural operation or idea) carried by the pictures and captions of visuals. It involves recognising the objects pictured, correctly interpreting the interrelationship among them, and understanding the various meanings they may symbolise.

Studies reveal that understanding depends on the type of representation, the captions, certain design factors, and viewers' socio-ecnomic characteristics.

Wingfield (1969) in a study cited by Coppen (1972), found that a "striking method of presentation" and design "simplicity" improves the attraction and viewer comprehension of posters. The study's methodology was to set up displays of five posters mounted consecutively over a period of five months. One hundred and one people found in the area, served as the sample. Each subject was asked if he took note of the display prior to meeting the interviewer, and what the messages were. Results were that 60 percent noticed the display, and of these, 45 percent partially understood the content. The conclusion of the study was that comprehension and attraction can be increased by a 'striking method' of presentation; and simplification of the content.

Daniels (1966) studied farmers understanding of three agricultural extension posters in Gusau district. The messages they carried were: (i) method of Guinea-Corn storage, (ii) application of fertilizer, and (iii) Groundnut harvesting procedures. The style of representation in the posters was naturalistic - realistic type; and was produced in four colours-(viz: - orange, yellow, black and brown).

The respondents were asked to (i) identify the objects/scenes depicted, and (ii) explain the agricultural operations (the message). Responses were marked 'yes' or'no' for correct or incorrect answers respectively. Percentage frequency distributions were computed. Results showed that the majority of respondents correctly identified the objects/scenes. However, they could not understand the messages. Daniels concluded that, the causes of the non-understanding were:(i) poor draughtsmanship of the artist, which made the message unclear; (ii) farmers illiteracy and (iii) their insufficient exposure to pictorial representations.

According to Baikie (1981) problems of visual communication with farmers involve the following questions:

> --------, which style of picture presentation communicates ideas to the farmers most effectively? Is it the black and white picture, colour picture, or simple line drawings? What of Posters? Are the contents in too much detail? Are they (the farmers) able to understand directions as represented in pictures say for seed dressing? The answers to these questions may seem obvious -------. But we should also be interested in those aspects of our presentations that blur the understanding of the farmer's ------- ideas we want to convey to them. That is the only way we can avoid committing the same mistakes in composing our pictures, -------(Baikie, 1981; Pp 17-18).

2.6.1. STYLES OF PICTURE PRESENTATION

Studies in Europe and America tend to indicate that the most easily comprehended is the 'cartoon' and similar limited information types. In the Ryan and Swartz (1950) study referred to earlier (supra P.26) cartoons were found to be easiest to comprehend while trace outline drawings, the most difficult. Horchberg and Brooks (1960) - cited by Kennedy (1974) - found that limited information pictures were as effective as black and white photographs in conveying information. Gombrich (1962) mentioned that meticulous drawing of details is not necessary to portray a shape; but deliberate omitting of some lines, shading or details in parts of the drawing, may enable the viewer to see the pictured objects much better. According to him, there's "illusion" power in "indeterminate forms". Arnheim (1974), however stressed that in abstracting and simplifying, a good visual artist, must steer a balance between reality and simplicity; what to abstract and how, should depend on knowledge of the audience.

Fraise and Elkins found that the most easily comprehended pictorial representation was 'accented drawings', next real objects, photographs, and lastly outline drawings.

They found that ease of understanding tends to increase with age between 7 to 22 years. This study was cited by Schiff (1980).

Kennedy (1974) showed that all-outline drawings that possess "high fidelty", can convey information, even to children. High fidelty was present, if viewers find the pictorial representation "spontaneously meaningful" and enabled them to recall "appropriate atmosphere". The following are features of high fidelty all-outline drawing:-

(1) Variations of contour; the thickness of the lines, and their length produces different representations and effects.

(2) Use of lines to depict:- "uneven surfaces, uneven textures, uneven illumination and uneven pigmentation". As an example, in depicting "uneven illumination only line-contour of the shadow (or light) are drawn. In this type of "all-outline" drawing, no shading or tonations, are used. Every feature is drawn with lines only,(ibid).

Kennedy informally tested an "all-outline' drawing of a zebra based on the above principles, among children. He found that majority understood it. A second test with adults, depicting cast shadows, similarly showed a high understading of the depictions, (ibid).

O'Connor and Hermelin (1974) cited by Kennedy (1974) found that subjects with low intelligence quotients were able to understand line drawings. Similar studies by Smith et al (1970) (cited in Kennedy (1974), confirm the above results. They found there was no differenc in the spatial depth information read into four types of drawings. These included: detailed shaded drawings; partially shaded line drawings; pure line drawings, and severely abstracted line drawing. Kennedy (1974) concluded that detailed, photographic pictures, are not necessary, to convey specific information.

Horchberg (1972) wrote that accented drawings (e.g. cartoons) were more effective in conveying information because of the following:- (a) Simplicity:- details have been eliminated. Only the essentials of the spatial form and other typical features are retained; (b) Contour:- The outline enclosing the form had an even continuous contour; (c) Clarity:- all sources of ambiguities have been eliminated by application of "gestalt laws of good organisation", (d) Drawing possesses aesthetic qualities.

The studies reviewed, tend to lead to the conclusion that limited information type of pictures are more easily comprehended, than others.

However, results of studies in Africa tend to oppose this conclusion. The studies reveal that Africans understand and prefer more detailed, naturalistic-releastic type pictures, than any other.

Holmes (1969) found that outline drawings were not understood by Africans. Instead detailed naturalistic --realistic ones were. Duncan (1964?) reported that abstracts and limited information pictures hold no interest whatsoever for Africans, because of the insufficient recognition clues in them.

Fugglesang (1973) found that "block-out" photographs (black and white) were easier to understand than outline drawings and silhouettes. He tested seventy Ethiopian illiterate samples. One purpose was to determine which of photographic, shaded drawing , silhouette and outline (traced) drawing was easiest to understand. Another, was to determine which of 'block-out' or normal (unretouched) pictures was most understood by the respondents.

For each type of representation, the two variations, viz: block-out and normal types were used. The realistic presentation portray subjects matter with background details and features.

Seven different messages were produced, each based on the above styles of representation. The outline drawings were direct tracings from the photographs.

Pictures were displayed, four at a time in a semi-circle around each respondent. They were asked: "can you tell what you see?" and "in which picture did you first see it?" The respondent answers and points to the appropriate picture. Percentage frequency distributions of "point-outs" per picture were computed. The result indicated that block-out photographs (black and white) had the highest number of point-outs. This was followed by "normal" photographs, then silhouettes; and others in that order. Fugglesang concluded that (i) block-outs were best understood because the background details, which **interferes** with perception, had been removed, (ii) photographs possessed greater realism and thus were easier for respondents (iii) Results for silhouettes was attributed to its greater 'gestalt'; contrast and simplicity.

Duncan et al (1973) findings supported the above. They studied the perception of pictorial representations by African and White school children in South Africa. The sample population included four hundred children of both sexes randomly selected from ten locations; involving European; urban and rural Bantu, Zulu; and Tsonga tribes.

Ten sets of picture materials were used, comprising altogether fifty-eight separate visuals. The pictures were classified according to the various artistic conventions to be tested e.g. shading, stick-figures, perspectives, etc. Each material was viewed by respondents in a pinhole box, or in a free situation. For the free-view situation, used in rural areas, pictures, mounted on approximately 11 inches by 5 inches cards were viewed from normal reading distances, by respondents. Hypotheses were made on each visual category; to verify the relationship between achievement in perception test and education, sex, tribe, race and location.

In the preference test, each respondent was shown two pictures at a time, and instructed to choose one that he liked more. Each chosen picture was scored one and the rejected zero. The mean score for each picture style was computed and cross-tabulated with 'race' and 'location' variables. Results showed that shaded drawings (realistic) was most preferred by all races and tribes. This was followed by cartoons, silhouette, and lastly line stick figures. The results for the rural Africans showed that they significantly preferred sihouette as the second choice; while cartoons was third.

In the comprehension test, respondents were asked "what did y u see?. Modal responses for each racial group per test item per class were taken, and cross tabulations computed. The results showed that whites tend to perform better than Africans in understanding pictorial contents; and in perspective cues, cartoons and simulated motion. Africans misunderstood line perspectives, foreshortening overlap, shadings on human figures, and motion cues (depicted by lines, and raised dust). Shadings on figures, were misinterpreted as diseases (or dirt). Also all children, irrespective of race, had difficulty with body shadows, but understood shadows cast on the ground. Males scored higher than females; and urban dwellers higher than rural population.

The explanation given for the whites superiority in the tests, was that they had greater exposure to pictures in their homes. Similar explanation was given to account for the differences in understanding between males and females; and between urban and rural dwellers. These results have been given support by Fugglesang (1973), and Omari and Mc. Ginitie (1974).

2.6.2. PROBLEMS OF GRAPHIC VISUALS

From the above studies, it can be seen that Africans have problems understanding shadings, outline drawings as well as motion lines, perspectives and depth cues.

Other problems include ambiguity and poor draughtsmanship. This was confirmed in the study of the understanding of visual symbols in Kenya carried out by the Centre for Educational Development Overseas (1969) and cited by Fugglesang (1973). It was found that ambiguities inherent in some line drawings, and poor draughtsmanship caused respondents' misunderstanding. The pictorial symbols used were shaded line drawings of animals, plants and house-hold equipment . The results showed that the respondents recognised familiar objects (e.g. cow, snakes), and "emotionally loaded" drawings. Those that were incorrectly identified included: horse, cat, goat, maize, pestile and bunch of bananas. The reasons for the misunderstanding were traced to: (i) inaccurate representation of details - due to ignorance of the correct facts by artists as well as poor draughtsmanship, and (ii) ambiguities of some representations. For instance, due to ignorance, the artist drew the goat with a tail hanging downwards. Responses showed that viewers called the drawing a cow. This was because, naturally goats' tails are turned upwards, and only cows and sheep have tails that turn downwards (Ibid).

Duncan et al (1973) citing studies by Winter (1963) and Holmes (1964) wrote that Africans were confused by depth cues in posters. Also that if too many figures were presented on one page, their understanding was reduced.

Studies by UNICEF and Nepal's National Development service (1976) tend to confirm the above finding. The study was to determine if Graphic visuals can be used to convey information to rural people of Nepal. The findings were that:- rural respondents want graphic visuals as an information media; that too many figures in a visual caused confusion (Block-out' types were more understood); and serialised, step-by-ste type drawings, and abstract symbols were difficult for respondents.

Problems of three-dimensional representations:

Hudson (1960, 1962, 1967), investigated pictorial depth perception of South Africans, using the Hudson pictorial depth perception test materials. Findings were that many Africans do not understand perspectives, overlapping, size constancy and foreshortening. He found also that understanding was related to exposure to western style pictures and schooling. (These studies are cited by Deregowski (1972) and Duncan et al (1973).

Deregowski et al (1972) found that spatial depth cues caused misunderstanding of pictorial contents, by Ethiopian rural samples. The test material used, depicted a hunting scene, in which a hunter aimed his spear at an elephant placed in the distant background of the picture. A buck was placed in the foreground, as the hunter, but standing opposite each other. Following perspective convention, the elephant, in the farthest distance, was drawn much smaller (in comparison with the buck). Knowing that in real life, the elephant was several times bigger than a buck, the respondents became confused, and called the pictured elephant, a goat, horse, etc(see fig.2.1.). Therefore, it was suggested that depth cues of "overlap" and "familiar size cue" should both be included in pictures. This would aid illiterate viewers understanding.

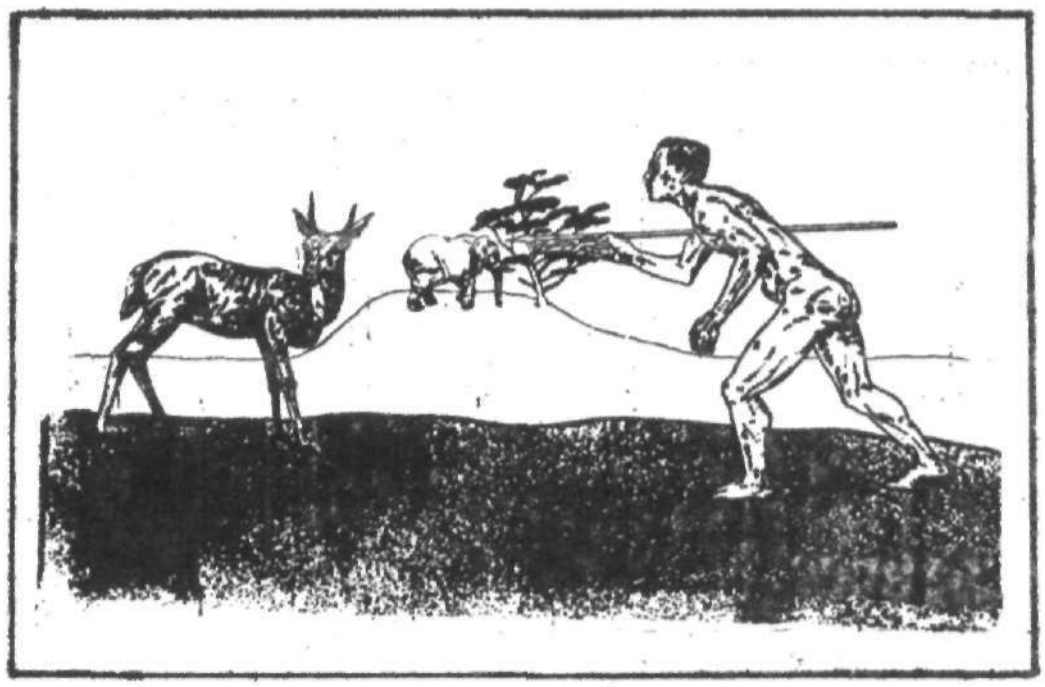


Fig. 2.1. **Deregowski's test visual**

Deregowski wrote that the respondents tend to peruse every detail, and see only bits and pieces of the picture. These bits had to be assembled, mentally, before they could understand the content. Children seemed to understand much faster than illiterate adults. Deregowski (1972) concluded that Africans had problems in understanding because: of the difficulty in integrating the individual pictorial cues and symbols into a meaningful whole, and the differences that exist between different cultures in the way they perceive pictures.

2.7. RELATIONSHIP BETWEEN COMPREHENSION AND PERSONAL CHARACTERISTICS

It may be inferred from all the above studies that age, education, location, exposure and sex, are correlated with understanding.

The more literate the viewer the higher the level of understanding according to Omarri and Ginitie (1974) and Yazidu (1976): Cupchick and Heinrich (1981) found that captions add more meaning to designs. Similarly Zimmerman and Steckel (1985) have shown that when captions are appropriately worded, messages of posters became much clearer, otherwise they led to misunderstanding.

Fugglesang (1973), in Ethiopia, found that urban dwellers tend to understand pictures more easily than rural people.

This was attributed to their greater exposure to pictorial representation through everyday interaction with magazines, newspaper pictures, and billboards in their urban location. A study by Horchberg and Brooks (1960) cited by Kennedy (1961), opposes the above findings: they maintain that prior learning was not necessary for understanding of pictures. In their study, one child was deprived of seeing or using all types of pictures until the age of two. When shown pictures for the first time, the child had no difficulty identifying the contents. This led to the conclusion that prior learning was not necessary.

However greater number of studies support the former theory and one can conclude that education, literacy and high exposrue to visuals are positively correlated with comprehension of visuals.

2.8. COMMUNICATION MODELS

Rogers and Shoemaker (1971), defined communication as the process in which "a source sends a message via certain channels to the receiving individuals". The process as applied to agricultural extension communication is diagramatised below; based on Igunnu (1978).

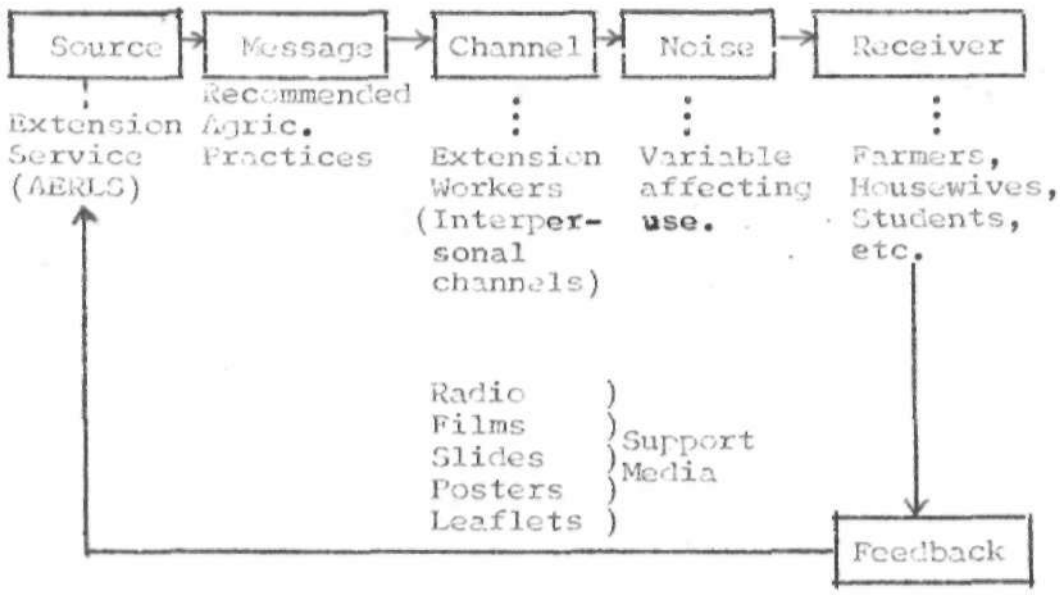


Fig. 2.2. A framework of the relationship between variables in the communication process, adapted from Igunnu (1978).

The model shows that various channels are used, and that noise interferes to affect the quality of message received. The noise variables include: quality of visuals, language barriers due to illiteracy, distribution problems, training of extension workers, and preferences of audience, according to Igunnu (1978).

The multi-stage model of information flow:-

According to Rogers and Shoemakers (1971) this model gives a realistic description of information flow, more than any other. Here the message from the source directly reach only a small fraction of the audiences.

It reaches the remaining audience through the network of interpersonal relationships. People who saw (or read) the message spread it to their relations and others, through conversation , etc. These in turn tell other people. Also some members of the audience, actively seek after specific information from different channels; and select among channels (ibid).

Mass media have been found to be more important at creating awareness; while interpersonal channels, more effective in changing attitudes according to Rogers and Shoemaker, (1971). Use of multiple media have been found to be more effective than single media. When mass media is combined with interpersonal channels, an even greater impact on audience, is achieved (ibid).

2.9. GRAPHIC VISUALS IN AGRICULTURAL EXTENSION INFORMATION:

Studies cited by Coppen (1970), Laskhman-Rao (1975) and Nelson (1977) indicate that posters are effective as perpetual reminders and in creating awareness of new products and ideas.

Trent and Kinlaw (1969) found that comic booklets could be used to disseminate educational information to lower class people. In their study, 200 housewives were randomly selected from the lower class'. These were people in the U.S.A., who belonged to few organisations, received few publications, attended few meetings, have low literacy level, read little and do not watch

educational television. Six comic booklets were used as test materials. Each contained Home Economic topics; they were designed to form a continuous story, and to be emotion packed. Characters used were selected from a day-time commercial television serial watched by 95% of the target audience. Professional cartoonists produced the drawings on contract. The women received one booklet per week for six weeks through post. The pre - and post-test of knowledge and practices adopted were conducted by interviewers. Results showed that 94 percent of the respondents read the comics, gained additional knowledge and practiced what they learnt. Trent et al found that their attitude to comics, was positive. They concluded that comics can be used to reach the lower class with educational information. They should be "well done" and have "good taste".

Defever, (1977) and Shauki (1974) wrote that simple visuals (wall charts and leaflets) were used in supporting agricultural, and population control campaigns in Dahomey, and Kenya respectively. Similarly, Perraton (1985), reported that posters, leaflets and pamphlets were used in conveying information to farmers in Malawi.

Gana (1975) found that circulation of extension graphic visuals and publications, in villages having field demonstrations in Minna helped farmers to adopt improved agricultural practices.

In the study, reception of extension visuals and publications by farmers in the two locations (villages with and without field demonstrations) were compared. Results showed significant differences. More farmers in villages with demonstration fields received publications than those in villages without. Gana recommended that "Recommended Practices" (one of the A.B.R.L.S. publications) should be made simpler to enable farmers follow the instructions easily. Similar recommendation was made by Sokomba (1978).

Extension visuals are usually displayed and distributed during publicity campaigns in rural areas, as well as during field days, open days and agricultural shows. According to Daniels (1966), at the time of his study, posters were displayed on walls of houses, on bulletin boards and on publicity vans, in Gusau district. Khalil (1981), wrote that visuals are distributed to farmers in Kano State, Also the extension visuals are used as teaching aids for teaching purposes and during farmers meetings, when leaflets are distributed to farmers.

Studies by Yazidu (1973), Arokoyo (1981) and Zaria (1984) tend to indicate that very few farmers are exposed to extension posters and leaflets.

Yazidu (1973) and Bogunjoko (1983) found that the most important of all the channels, in terms of frequency of mention as source of agricultural information by farmers, is the radio. Next in rank order, according to Yazidu (1973) is extension workers; then neighbours and friends. Towards the lower end of the list are extension graphic visuals, then newspapers, agricultural shows, television, films, in that order. Similar findings were reported by Arokoyo (1981) and Zaria (1984). Williams (1968) in studies of parts of Western States, and Zaria (1984), found that farmers consult multiple media for their agricultural information.

Sokomba (1977) citing Coughenour and Patel (1962), and Leuthold (1966), wrote that farmers' personal characteristics such as age, education, status, cosmopolitism, income, organizational membership and local opinion leadership, are highly correlated with use of information sources. Further, citing Kearl and Brown (1967), Sokomba (1977) wrote that many mass media communication efforts fail because the media contents lack local relevance. Sokomba (1977) lists other problems of publications as: lack of aedquate transportation system (thus poor distribution of visuals) and lack of clarity in the contents. Lakshmana-Rao (1975) and Adkins (1983) mention similar problems.

subject, should be laterally wide (and relate to other sectors of the society) rather than vertical, in-depth study of one issue. Similar concepts have been advanced by Akinbode (1976); Adkins (1984) and Hursh-Cesar with Roy (1976). According to Hursh-Cesar and Roy (1976)such methods could use purposive sampling, group interviews and combinations of techniques. Researchers should also take on only manageable objectives. Validity, reliability and applicability can be improved by:-
(a) reporting of all biaises in the research report,
(b) using a combination of methods such as key informants, case studies, and participant observations; and (c) intensive documentation of relevant previous studies.

The present study used a combination of methods including survey, key informants interview, observations and content analysis of comments.

2.11. SUMMARY

This chapter reviewed past studies on the following issues: (a) classifications of pictorial representations (b) design factors affecting comprehension of posters and leaflets (c) the relationship between comprehension and age, sex, location, occupation, exposure, literacy, education, categories of pictorial representations (d) problems of graphic visuals, (e) utilization of the visuals in agricultural extension information and (f) survey research

techniques in developing nations.

The next chapter covers the procedure used for the present study. The study is to investigate the extent of comprehension and use of extension graphic visuals. A sample of 165 rural respondents', were surveyed; and 31 agricultural information personnel and other key informants were interviewed. The results were analysed with percentage frequency distributions, crosstabulations and chi-square. The analysis, shows the types of visuals respondents understood easily, and the relationships between design factors, respondents personal socio-economic characteristics, understanding and use.

2.12. REFERENCES

Abaderin, A.O. (1978), "Book Production in Nigeria; The role of the graphic artist". M.A. Thesis, A.B.U., Zaria.

Ajakaiye, M.E. (1980), "The Role of Educational Technology in Agricultural Extension". Paper delivered at the NAVA convention, Zaria, Kaduna State, May 1980. (Memeographed).

Akinbode, Adefolu (1976) "Making Research More relevant to policy making". Research and Public Policy in Nigeria Kumo. S and Aliu, A.(eds), A.B.U., Zaria.

Arnheim, Rudolf(1969) Visual Thinking. University of California. Berkeley Pp.137, 140, 143, 151.

_____(1974) "Virtues and Vices of the Visual media". Media and Symbols. The Forms of Expression, Communication and Education. Olson, D.R. (ed). 73rd year book of the National Society for the study of Education, Chicago.

Arokoyo, Tunji (1981) "The Diffussion and Adoption of Recommended Agricultural Practices Among Farmers in the ten Northern States of Nigeria" Unpublished Ph.D. Thesis, University of Wisconsin - Madison, 1981.

Baikie, Adamu (1981) "Keynote Address Delivered at the opening session of the Agricultural information Workshop". Agricultural Information Workshop Proceedings, A.E.R.L.S., A.B.U., Zaria, October 18-23, 1981.

Bogunjoko I.O. (1983) "Source of Information of Improved Farm Practices. A study of farmers in Giwa district of Kaduna State". Nigeria Journal of Agric. Extension, Vol.1,2, June, 1983 p.65,66.

Bulloughs Robert V. (1978) Creating Instructional Materials (2nd edition). C.E. Merill Publishing, Columbus, P106, 107, 110.

Collins L-Belinder and Pierman, C.B. (1979) "Establishing ways to decide whether people understand symbols". Industrial Design, July/Aug, 1979 Pp 49-50.

Coppen, Helen (1972) A Survey of British Research in Audio Visual Aids 1945-1971. National Committee for A-V, Aids in Education, London P22.

Cupchick G.C. and Henrichs. R.W.(1981) "Towards an Integrated theory of Aesthetic perception". Advances in Intrinsic Motivation and Aesthetics. Hy I. (ed), Plenum, New York, 1981.

Daniels, C.B. (1966) "A case study of knowledge transfer in the Gusau Extension project, Nigeria" Unpublished M.Sc. Thesis, Kansas State University, Manhattan, Kansas, P.80, 86-89.

Defever, A.(1977) "Integrated Development Support Communications. "Communications Policy for National Development, Routledge and Kegan Paul, London

Deregowski, J.B.(1972) "Pictorial perception and culture" Scientific American, Vol.227(5), 82-88.

Deregowski, J.B., Mouldrwo, S. and Mouldrow, E. (1972), "Picture Recognition in a remote Ethiopian population. Perception. 1; 417-425.

Duncan, Hall (1964) "Experimental Research Design for Evaluation, of African Reactions to cartoons". Indiana University, School of Education, Training handout (n.d.).

Duncan, Hall; Gourlay N., and Hudson, W.(1973) A study of Pictorial Perception among Bantu and White School Children in South Africa. Withwatersrand University, Johannesbourg, P.5,43,44,83,125-126,153.

East Marjorie (1952) Display For Learning. The Dryden press, New York. Pp. 5-12, 65, 66, 78-79, 100.

Fugglesang Andreas (1973) Applied Communication in Developing Countries. Dag Hammarskjold, Sweden.

Gana, F.S. (1975) "An Evaluation of package Result Demonstrations in Villages with and without field Demonstrations in Minna, Nigeria". Unpublished M.Sc. Thesis, Kansas State University. Manhattan, Kansas.

Gombrich, E.H. (1962). Art and Illusion. Phaidon Press, London, P.187, 196, 223, 275, 267.

_____(1972) "The Visual Image", Scientific American, Vol.227, Pp.82.

_____(1974) "The Visual Image", in Media and Symbols Olson, D.R. (ed), 7rd yearbook of the National Society for the study of Education, Chicago.

Hagen, M.A. (1978) "An outline of an investigation into the special character of pictures" Modes of percepcieving and processing Information, Pick, H.L. and Elliot, S. (eds), Lawrence Erlbaum Associates New Jersey.

Haber, R.N. et al (1973) The Psychology of Visual Perception. Holt, Rine Hart and Winston, New York. P.42, 46.

Hershfield et al (1976) "Problems in interviewing" Third World Surveys - Survey Research in Developing Nations, Hursh-Cesar, G. and Roy, P.(eds) Mac Millian (Company of India, Delhi.

Herzog et al (1976) "Problems in measurement" Third World Surveys-Survey Research in Developing Nations, Hursh-Cesar, G. and Roy, P.(eds) Mam Millian Company of India, Delhi.

Horchberg, Julian (1972) "The Representation of things and people." Art, perception and Reality. M. Mandelbaum (ed). John Hopkins University Press, Baltimore.

Horchberg, J. and Brooks, V. (1962) "Pictorial perception as an unlearned Ability" American Jnl. of Psychology 851, 624-628. Cited in Kennedy (1974). P.240.

Igunnu J.A. (1978) "Utilization of Agric. Films and Slides by County Agents in Wisconsin." M.Sc. Thesis University of Wisconsin, Madison P.3.

Jegede, J.O. (1978) "An investigation of secondary school students, perception of line diagrams used in teaching of Biology", M.Sc. Thesis. A.B.U., Zaria.

_____(1985) Personal interview, A.B.U., Department of Education, April-May, 1985.

Kaupelis, R. (1966) Learning to Draw. Watson-Guptil Publications, New York. P.139.

Kepes, Gyorgy (1959) Language of Vision, Paul Theobald and Co, Chicago.

Kennedy, M.John (1974) "Icons and Information". Media and Symbols - The Forms of Expression, Communication and Education, Olson, D.R. (ed), 73rd yearbook of the National Society for the study of Education, Chicago.

Khalil I.Ali (1981) "Report of Extension Demonstration Unit in Kano State Ministry of Agriculture and Natural Resources". Agricultural Information Workshop Proceedings, A.B.R.L.S., A.B.U., Zaria, October 18-23, 1981.

Kingman Lee (1978) (ed) Illustrators Notebook, The Horn Book Inc., Boston. Pp. 11-12, 13, 15.

Lakshman-Rao, R.V. (1975) Mass Media in Society, Reports and Papers in Mass Communication (No.65). Lessons from Research, UNESCO, Paris.

National Development Service of Nepal/UNICEF (1976), "Communicating with Pictures" in Development Communication Report No. 52, 1985

Nelson, Paul Roy (1977). Design of Advertising, Wm. C Brown Company, Dubuque, Iowa. Pp.179-180, 182-183, 268-273.

Ochi Noroshi (1957) "Concrete and Abstract Presentment in Posters" International Poster Annual, 1956/57 Pp.8.

Omarri, I.M. and McGinitie, W.A. (1974), "Some pictorial artifacts in the studies of African children". Child Development Vol.45, 2, 533 June, 1974.

Pausewang, S. (1973) Methods and concepts of social Research in a Rural Developing Society. Weltform-Verlag, Munchen.

Perraton Hillary (1985) "Agric. Extension and Mass Media" Development Communication Report; 44, 1985 December.

Rogers, E, and Shoemaker, F. (1971). Communication of Innovation. The Free Press, New York, Pp. 14-15,205-209, 252-253.

Roy Prodipto et al (1976) "The survey setting", Third World Surveys. Survey Research in Developing Nations, Hursh-Cesar, G. and Roy, P.(eds.) Mac Millian Company of India, Delhi.

Shawki M.B. (1974). "Integrated Communication Experience in Kenya". Integrated communication: Bringing people and Rural Development together. East-West Comm. Institute, Honolulu, P117.

Schiff Willaims (1980). Perception: An Applied Approach, Houghton Mifflin, Boston.

Sigel E. Irving (1978). "The Development of Pictorial Comprehension". Visual Learning, Thinking and Communication. Bikkar, S.R. and Coffman, W.E.(eds.) Academic Press, London.

Sokomba, Tsado Jonathan (1977). "Reception, Understanding and Use of Extension Publications by extension workers in Nigeria", M.Sc. Thesis, University of Wisconsin, Madison.

Thapur Romesh (ed.)(1958). Visual Aids in Foundamental Education and Community Development, UNESCO Paris, P.7, 22, 25.

Trent G, and Kinlaw R. (1979) "Comic Books: An Effective Teaching Tool, "in Journal of Extension Vol XVII. Pp.18-27.

Voh, J.P. (1979) Study of Factors Associated with adoption of Recommended Farm Practices among Giewa Farmers, Samaru Miscellaneous Paper 73, I.A.R., A.B.U., Zaria.

Wingfield et al (1969) Cited in Coppen Halen (1972), A survey of British Research in Audio-Visual Aids 1945-1971. National Committee for Audio-Visual Aids in Education., London 1972.

Williams, G.R. (1956/57) "How to get better 24-sheet posters" International Poster Annual 1956/57.

Williams S.K.T. (1968) Sources of Information on Improved Farming Practices in some Selected areas of Western Nigeria. University of Ife, Extension Education and Rural Sociology Department Research Monograph 5, June, 1968.

Yazidu, Imrana (1973) "The study of Radio as a means of Communicating Agric. Information to Farmers in Northern States of Nigeria, M.Sc. Thesis, Ahmadu Bello University, Zaria.

_____(1976) "Public Communication and Results". Research and Public Policy in Nigeria., Kumo, S. and Aliyu, A. (eds.) A.B.U., Zaria.

Zaria, M.B. (1984) "An Evaluation of the National Accelerated Food Production Programme Strategy for increased Sorghum Production in the Zaria, L.G.A.", M.Sc. Thesis, A.B.U., Zaria.

_____(1985, and 1986) personal interview, A.B.R.L.S./A.B.U., Zaria.

Zimmerman, M. and Steckel, L, (1985), "Formative Research: Pretesting, Revising and more Pretesting. "Development Communication Report Autum, 1985, No. 51, Pp.9, 12.

CHAPTER III

3. METHODOLOGY

Data was gathered in a survey involving five villages in Zaria, L.G.A. The data gathering instruments included a structured questionnaire and 15 extension visual test materials. Supplementary ones were: (a) interviewing of agricultural information personnel and communication specialists and (b) personal observations.

3.1. QUESTIONNARIES

The main questionnaire was divided into two parts; part one dealt with respondents age, occupation, education; their exposure to extension visuals, sources of the exposure uses of the visuals and their attitude towards extension visuals. To determine exposure, use, and attitude, respectively, the following questions were asked:-

(a) Have you ever seen/read and received any extension visuals? How frequently?

(b) Where did you see/received them? What do you most often do with the visuals/the information received?

(c) Would the information help your farming activities?

Part two comprised the comprehension test. Questions were asked on each test materials. The questions were "what do you see in this poster/leaflet? or "what is the message of this poster/leaflet?" In addition, respondents were asked to identify the agricultural symbols in the special

symbols sheet. In the preference test, questions asked were: (a) "choose the most naturalistic/realistic poster/leaflet" and (b)"choose one poster/leaflet that you like best".

3.2. MEASUREMENTS:

Questions were so worded as to elicit "yes" or "no" responses; or checking blank spaces in a check list of multiple choice. A scale consisting of "agree, not sure, disagree" was also used. According to Roy et al (1976) eliciting responses with yes/no, multiple choice items, and similar simple methods, are more appropriate for interviewing rural people in developing countries. Ogunduyile (1985) found that respondents "concentrated more" on the two extreme points, "best" and "poorly made" embroidery works, in responding to his Likert-Scale measurement, consisting of five items ranging from "best", "very good", down to "poor". This supports Roy et al's suggestion given above.

Instruments validation was done by panel judgement and pilot test. The panel included twelve A.B.U., academic staff, of at least senior lecturer level. They were given the test items and questionnaires to decide ammendments to be made. Agreement among any three judges was used as basis for ammending or delating items. Jegede (1978) used panel judgement among other methods, to validate his Biology diagrams perception

test. Ogumbi (1986) suggests panel judgement in validating instruments to be used for formative evaluation research in radio and television.

The pilot test was done with 42 respondents in Samaru. The respondents were practising farmers who came from neighbouring villages to purchase farm inputs in AERLS. They were interviewed with the validated questionnaires and test materials. The pilot test revealed questions that were difficult or ambigous to reapondents. These were replaced or reworded. From the results of analysis of the data, six visuals were selected. They were those that had high or low level of comprehension or preferences scores. These constituted the extension visuals assessed by the communication specialists.

3.3. VARIABLES AND HOW THEY WERE OPERATIONALISED

Literacy Level: Voh (1979) measured literacy by scoring respondents ability to read any one or all of three sentences. Zaria (1984) measured it by ability of respondents viz: fluent, average and illiterate, in each language. Literacy was measured in this study by the ability of subjects to read some or all sentences of the caption of a poster in each of English, Hausa and Ajami. The responses were scored 1,2, or 3 in increasing order of fluency. Little or no ability to read some phrases was scored one (illiterate), ability to read all sentences was scored three (literate)

and average ability(in between these two) was scored two. Illiterate were respondents who could not read nor write any one of English, Hausa and Ajami scripts.

Education level: Zaria (1984) measured education by the number of years spent in formal schooling. The same type of measurement was used in this study.

Farming Experience: Measured by the number of years respondents have been engaged in farming. This measure was used in studies by Bogunjoko (1983) and Zaria (1984).

Attitude: was determined from responses given to the question: "would the visuals be of use in your farming activities?", as well as from the general comments respondents made.

Exposure: According to Herzog et al (1976) exposure involves the frequency, intensity, contact, and nature of the content, of information received by a public. Exposure in this study, was determined by the following indicators:- Whether respondents saw/read/received extension visuals or did not; and the frequency of the above; viz "quite often" (scored by 3) "not so often" (=2), "rarely" (=1), and never" (=0). These were grouped into 'high' and 'low'. Scores of 2 or 3, were grouped as 'high', all others were grouped as 'low'.

Occupation: as given by farmer. Responses were then grouped into: (1) full time farming (2) part-time farming and modern occupation; or part-time farming and traditional occupation, based on Voh's (1979) measure. Modern occupation include the following: teaching, tailoring, motor driving, civil servants (messengers, labourers) and carpentry etc. Traditional occupation includes - embroidery, blacksmithing, petty trading, leather work and weaving.

Use: was measured by the following indicators:
(1) subsequent actions after receiving the information; whether respondents "apply the information; in their farming, "further discussed with others, "or "did nothing". (2) what they most often did with the extension visuals: whether or not they "destroyed", kept, read them afterwards, or gave them away". (3) place where they saw/received the visuals. A similar measure used by Sokomba (1977), served as the basis for the present measure.

Preference: Is choosing, favouring one visual above another.

Respondents chose the extension visual they "like best", and another that is "most naturalistic-realistic". The chosen visual was scored one and the others zero.

Comprehension: Sokomba (1978) and Duncan et, al (1973) measured comprehension by proportion of correct responses in the comprehension test. Correct responses where scored

'one' and wrong responses zero for each test. The same measurement was used in the present study. High level comprehension for a set of visuals, was determined by frequency of scores that were higher or equal to the median mark, while low comprehension were those below it. Comprehension scores were obtained on the test visuals listed below (3.4). Each category was regarded as a dependent variable.

Problems of Comprehension

This was determined by asking respondents who gave 'wrong' answers (to any comprehension test) to indicate agreement or otherwise, with two or more statements. These probed the possible causes of the wrong responses. Respondents answered by choosing "agree", "not sure", or "disagree". This scale was then regrouped into "correct" and "incorrect". "Not sure" was combined with "disagree" to give the "incorrect" category. When the modal response is the "incorrect' category, this indicated a problem in interpretation, recognition of depicted objects or message content. In additon, respondents' comments (when asked to "comment generally on the visuals"), were subjected to content analysis, to find problems of pictorial content, coding and captions.

2.4 DESCRIPTION AND CLASSIFICATION OF TEST MATERIALS

The classification and selection of the test extension visuals was based on the following criteria:- styles of pictorial representations, spatial depth representation

techniques; farmers familiarity with the subject, and relevance to their needs. These factors have been discussed earlier (supra, p25-29.) The classifications are not mutually exclusive. Categories of styles in art overlap according to Duncan (1964), who wrote that terminologies in art are not standardised. Nelson (1977) also wrote that artists deliberately aim at unique and personal art styles. Selection depended on the availability of particular types of the visuals in A.E.R.L.S., Zaria, at the begining of the study. The classifications are as follows:

3.4.1. Naturalistic/Realistic Type: are detailed, shaded representations. Perspective techniques are present. Up to four colours are used. The visuals are: (1.1). "Dress seeds with aldrex 'T'. In this poster a farmer is depicted, applying aldrex 'T'. In this poster a farmer is depicted, applying aldrex 'T' to seeds. His farm serves as a background feature. (1.2). "Nigerian Agricultural Cooperative Bank" (poster):- Two farmers outside a village-level Agricultural Cooperative Bank (which is in background). One who had received the loan points to the Bank.

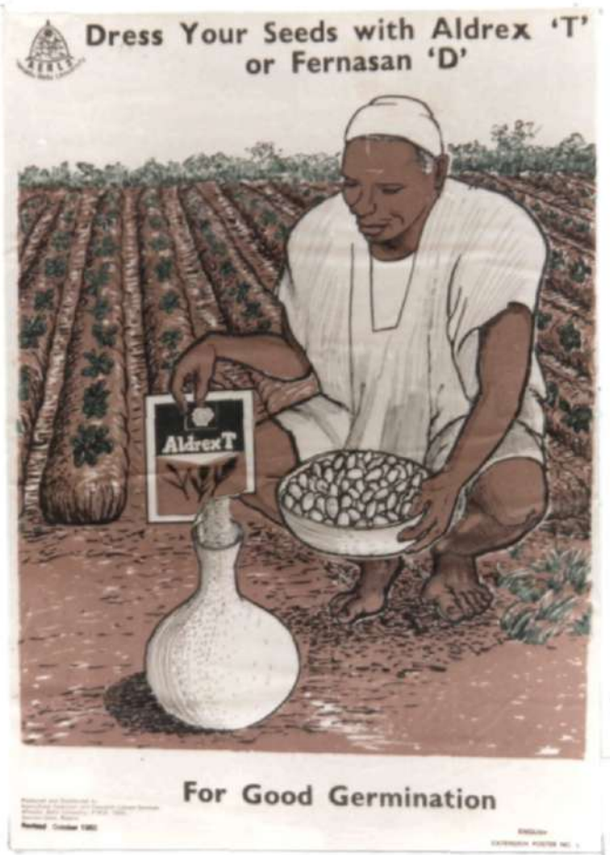
(1.3). Raise Rabbits (poster):- Displays rabbits feeding on local vegetables, with side of the cage as background. (This was not tested in the comprehension test).

(1.4). 'Improve your Grain storage' (leaflet):-

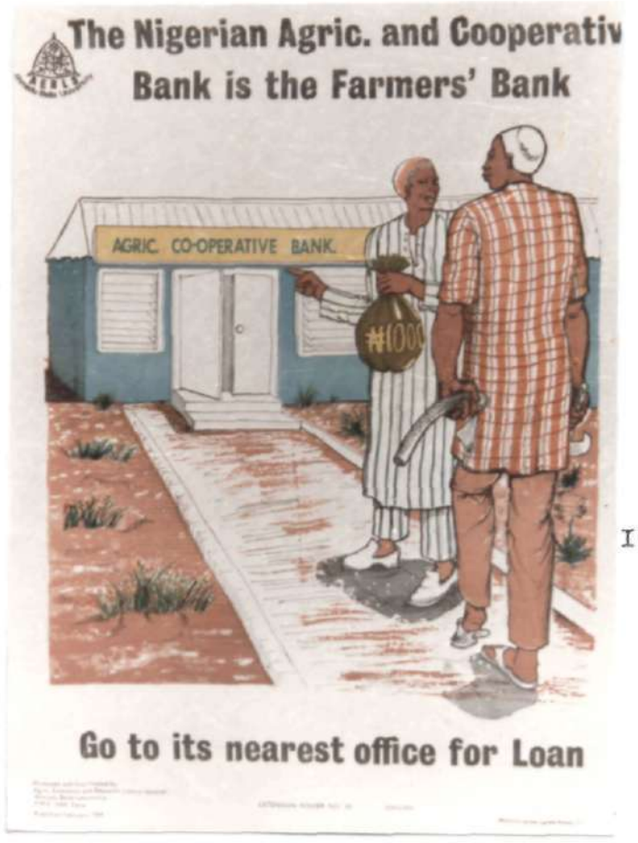
shows how to store grains in the local mud granary (Rumbu). Chemicals are applied as the grains are poured in.

(1.5.) 'Guinea-corn production' (leaflet):- shows how to prepare the land, plant, fertilise, weed and harvest guinea-corn.

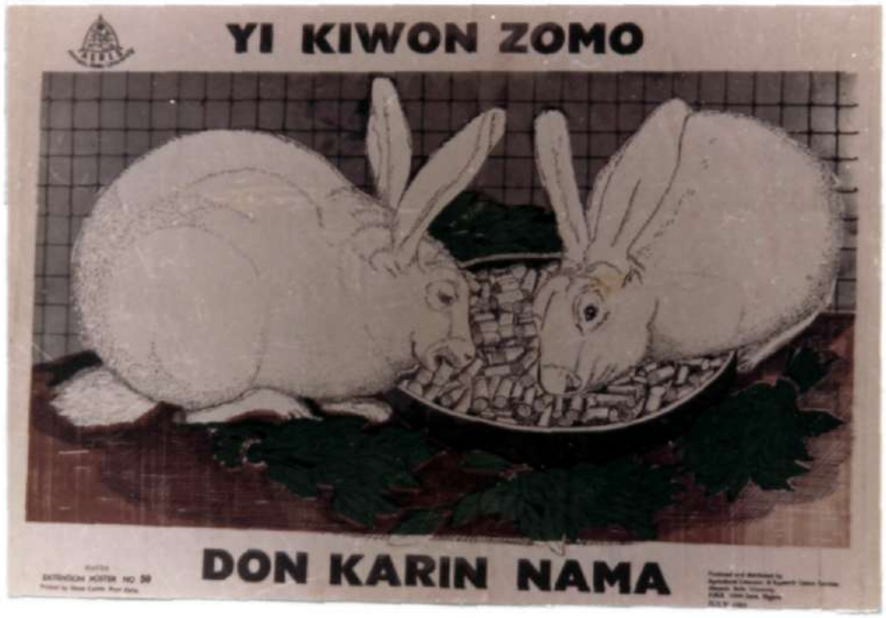
(1.6). 'Citrus production' (leaflet): shows how citrus orange is cultivated, from initial land preparation through transplanting to final harvesting stage. The posters and leaflets discussed above are pictured in plates I to III and IV to VI respectively.



I Dress seeds with Aldrex 'T' (1.1.)



II Nigerian Agric. and Cooperative Bank, (1.2.)



III. Raise rabbits (1.3).

IV Grain Storage (inner spread). (1.4).



1. Cut and dry heads properly before storing.



2. Clean the grainery thoroughly.



3. First spread one bundle of guineacorn on clean floor.



4. Then sprinkle evenly 1½ matchbox full of "Gammalin A" dust.



5. Continue to add more bundles.



6. And sprinkle more "Gammalin A" dust.



7. Harvest and dry your guinea corn as soon as matured.



8. Use "Gammalin A" only when storing for six months or longer.

Printed by Ilmorin Press Ltd., P.O. Box 471, Kaduna

Recommended Practices For Guineacorn Production



Select the best seed recommended by your Extension Worker

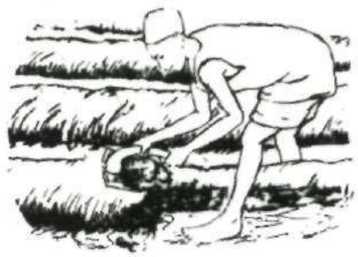
Produced and Distributed by:-
Agricultural Extension and Research Liaison Service,
Ahmadu Bello University,
P. M. B. 1044, Zaria, Nigeria.
Reprinted. December 1978

EXTENSION LEAFLET No. 11

V. Guineacorn production, (1.5.) Top:- cover spread.
Bottom:- inner spread.



1. Apply supa to old furrows before ridging.



2. Make new ridges to cover the fertilizer.



3. Dress your seeds with "Aldrex T" or "Fernasan D" for better stands.



4. Plant about 10 seeds per hole at 60 cm. (2ft) spacing

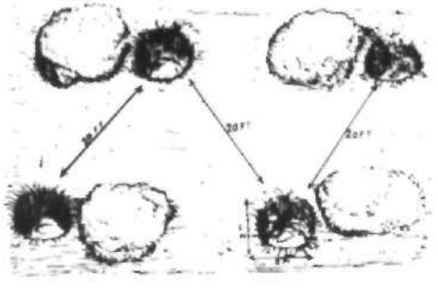


5. Weed and thin to two plants per stand, 2-3 weeks after germination.



6. Apply Urea or Nitro chalk 8 cm. (3") away from each stand 3 weeks after germination

V Citrus production (inside spread) (1.6.).



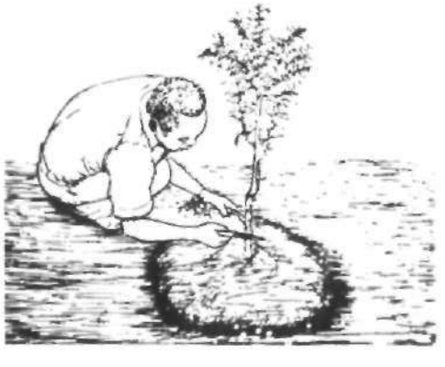
1. Dig holes on permanent site at the correct spacing.



2 When transplanting keep roots straight and neck of roots at ground level.



3. Apply fertilizer around the seedlings



4. Prune all side shoots from the stock.



5. Cultivate around the seedlings and cutlass the grasses in the orchard



6. Water your seedlings regularly during the dry season

3.4.2. Limited Information Type:

Included in this category are: all-outline and "single image" types. Both are characterized by bare essentials and restricted shadings (supra p: 25, 35,)

All-Outline: This includes drawings with lines only and without shadings. The test materials are:-

(2.1) 'Control Poultry diseases' Poster:- depicts a veterinary officer vaccinating chickens in a poultry house. Owner stands aside.

(2.2) Agricultural Cooperative society (Leaflet) shows advantages of joining Agricultural Societies and how they may be set up. It is one of the hypothetical alternative formats. It is different from the existing leaflets in size and format. The size is 33cm by 27cm. (fullscap) instead of the present 42cm by 29cm (A-4 size). Its features are economic use of paper, possibility of duplicating through the gestetner scanner and duplicating machine, to obtain several copies if occasion demands. Another in this category is the "Groundnut disease Control" leaflet (number 2.3 below).

(2.3). "Controlling Groundnut Diseases" (Leaflet):- Shows some procedures for controlling groundnut diseases. It was hypothesized that higher proportions of respondents will prefer naturalistic/realistic visuals more than out-line-only type.

Single-image(or block-out), carry only one bold image placed on a plain background. The visual tested here is:

(3.1) "Select Best Millet heads". This poster shows a farmer holding some heads of good millet. Limited information type visuals are displayed in plates VII to XI.



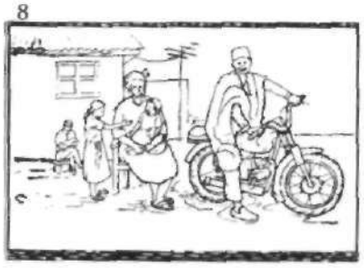
VIIControl poultry diseases(2.1).

7 YOU CAN PURCHASE FARM INPUTS CHEAPLY



Kana iya sayan Kayan noma da sauki.

8



Ta hoyan Kungiya za ka samu rayuwar iyalin ka.

COOPERATIVE SOCIETY WILL IMPROVE YOUR LIVING STANDARD

Agricultural Extension and Research Liaison Services,
Ahmadu Bello University
P.M.B. 1044, Zaria - Nig.

Amfanin shiga Kungiyan Manoma

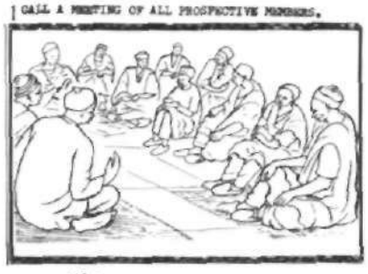
da yanda zaa kafa ta



AGRICULTURAL COOPERATIVES

VIII. Agric. Cooperative leaflet (2.2.) Top:-front spread. Bottom:- Inner spread.

1 CALL A MEETING OF ALL PROSPECTIVE MEMBERS.



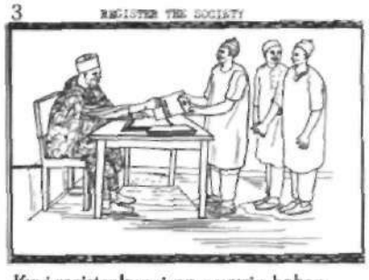
Akira taron masu son zama yan kungiya duka.

2 SELECT AN ORGANIZING COMMITTEE.



Ku zabi yan kwamitin shirye-shirye.

3 REGISTER THE SOCIETY



Kuyi register kungiyan a wurin baban jamiin Hadakai na Kungiyoyi a jihar ku.

4



Ta hanya kungiya kana iya samu n ranche n Kudi.

THROUGH COOPERATIVES YOU CAN OBTAIN LOANS EASILY

5



Ku na iya hada kai a aikin gona.

YOU CAN HAVE A GROUP FARMING ENTERPRISE

6



Kuna iya sayar da amfanin gona ahade

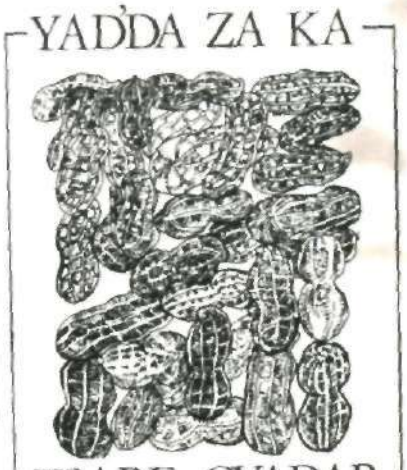
YOU CAN MARKET PRODUCE COLLECTIVELY



5. Yi feshi da Maganin Dithane M45, don kare cututtuka.



6. Afir de gyada da zaran ta kosa. Abarta ta bushe sarai.



IX. Controlling G.Nut diseases (2.3.) Top:- front spread
Bottom:- Inner spread.



1. Nemi ingartancen iri wurin Mallaman gona.



2. Ka wanke iri da maganin kwarin Aldrex 'T' ko Fanasan 'D' lokacin shuka.



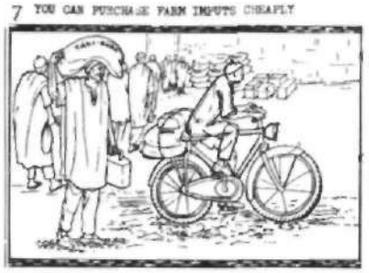
3. Shuka kwaya biyu a kowani rami: Gajarta tsakanin tushe da tushe na taimakawa wajen kare cututtuka.



4. A kula kada abar gona da sunkuru.

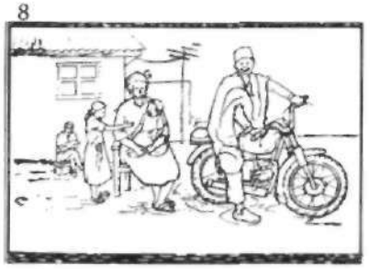
Fara yin noma bayan sati biyu ko uku da yin shuka. Ko kuma ka yi amfani da maganin ciyawa mai lamba Dual 500EC ko Basagran.

7 YOU CAN PURCHASE FARM INPUTS CHEAPLY



Kana iya sayan Kayan noma da sauki.

8



Ta hoyan Kungiya za ka samu rayuwar iyalin ka.

COOPERATIVE SOCIETY WILL IMPROVE YOUR LIVING STANDARD

Agricultural Extension and Research Liaison Services, Ahmadu Bello University, P.M.B. 1044, Zaria.

Amfanin shiga Kungiyan Manoma

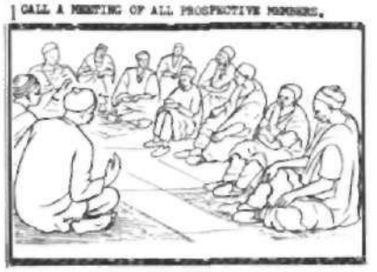
da yanda za'a kafa ta



AGRICULTURAL COOPERATIVES

VIII. Agric. Cooperative leaflet (2.2.) Top:-front spread. Bottom:- Inner spread.

1 CALL A MEETING OF ALL PROSPECTIVE MEMBERS.



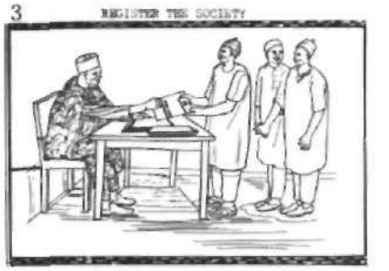
Akira taron masu son zama yan kungiya duka.

2 SELECT AN ORGANIZING COMMITTEE.



Ku zabi yan kwamitin shirye-shirye.

3 REGISTER THE SOCIETY



Kuyi register kungiyan a wurin baban jamiin Hadakai na Kungiyoyi a jihar ku.

4



Ta hanya kungiya kana iya samu n ranche n Kudi.

THROUGH COOPERATIVES YOU CAN OBTAIN LOANS EASILY

5



Ku na iya hada kai a aikin gona.

YOU CAN HAVE A GROUP FARMING ENTERPRISE

6



Kuna iya sayar da amfanin gona aha'de

YOU CAN MARKET PRODUCE COLLECTIVELY

X. (2.2SL). Formats suggested for illiterates and semi-literates (supra p.155).



Akira taron masu so n zama yan Kungiya duka.



Ku zabi Kwamiti n shirye-shirye.



Kuyi register Kungiyan a wurin baban jamiin hadakai na Kungiyoyi a jihar ku.



Ta hanya kungiya kana iya samu n ranche n kudi.



XI. Select best millet heads (3.1).

3.4.3. Multiple Panel Type: This display two or more rectangular panels of representations. Captions may be placed beneath each, according to Nelson (1977). Visuals here include the following:

(4.1) 'Apply Fertilizer on your guineacorn farm' (poster). This is double panel (two stage) poster. The upper panel shows two farmers applying fertilizers in between ridges. The second shows farmers harvesting guineacorn. The message is 'apply fertilizer on guineacorn farms for higher yield',

(4.2) 'Balanced diet for the family' (poster):- Shows three classes of foods which families should eat daily. Family is shown by a woman and child. This is a chart type poster. It was hypothesized that this category will be found difficult to understand by illiterates.

3.4.4. Mixed-Stylised: The pictorial representation here are of mixed styles. Deliberate attempt was made to use unique techniques. Those tested are:

(5.1) Hybrid maize' (poster): Depicts a man planting maize. A maize cob is also depicted.

(5.2) 'Rabbit raising' (leaflet):- Describes how to raise rabbits.

This category and also "Controlling Groundnut Diseases" leaflet were designed independently without consultations with agricultural specialists, and were produced for the purpose of this test.



XII Apply fertilizer to G. Corn farm (4.1.)



XIII Balanced diet (4.2).

Plates XIV and XV are the mixed/stylised visuals.

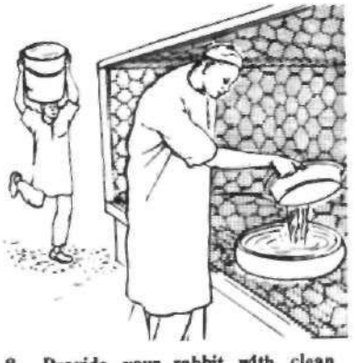


XIV. Hybrid maize poster (5.1).

XVa. Raise rabbits (cover spread) (5.2).



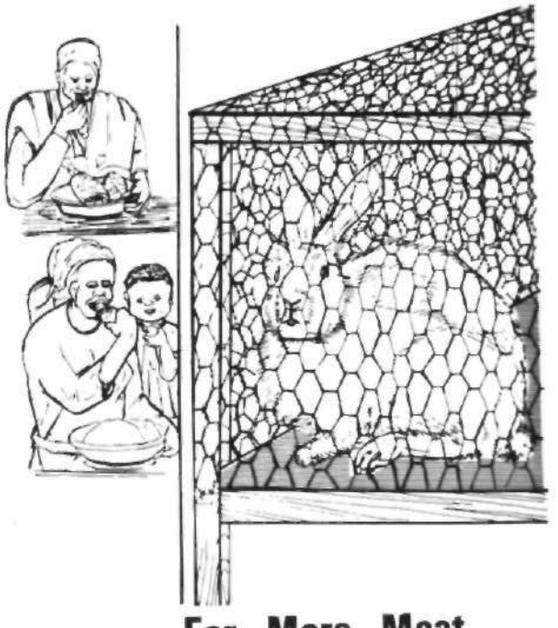
7. You can feed rabbit with vegetable wastes and food left overs



8. Provide your rabbit with clean water always

PRINTED BY BABA PRESS ZARIA

Raise Rabbit



For More Meat

Produced and distributed by:
Agric. Extension and Research Liaison Services
Ahmadu Bello University
P. M. B. 1044 Zaria — Nigeria
Published: June, 1985

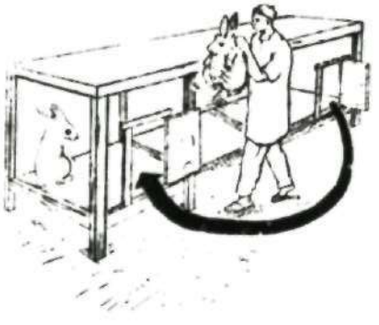
ENGLISH

EXTENSION LEAFLET No. 33

XVb Raise rabbits (inside spread) (5.2).



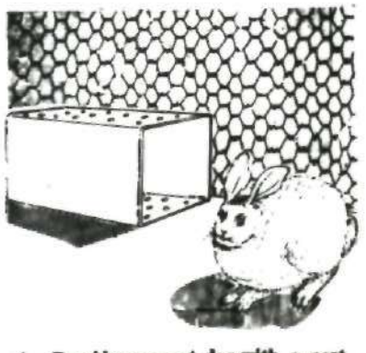
1. Keep adult rabbits singly in cages



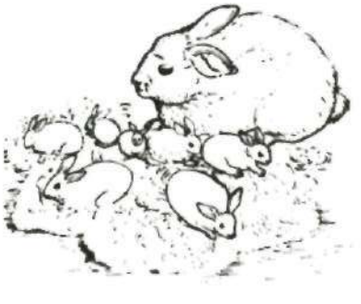
2. Take female rabbit to male rabbit for mating preferrably in the mornings or evenings.



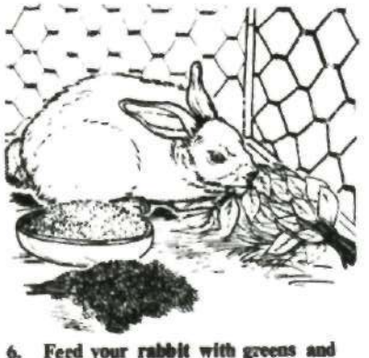
3. Take good care of your pregnant rabbit



4. Provide pregnant doe with a nest box three weeks after mating



5. Give good management to get 4 litters per year with 6-8 young ones per litter



6. Feed your rabbit with greens and grains

3.4.5. SYMBOLS-TEST SHEETS

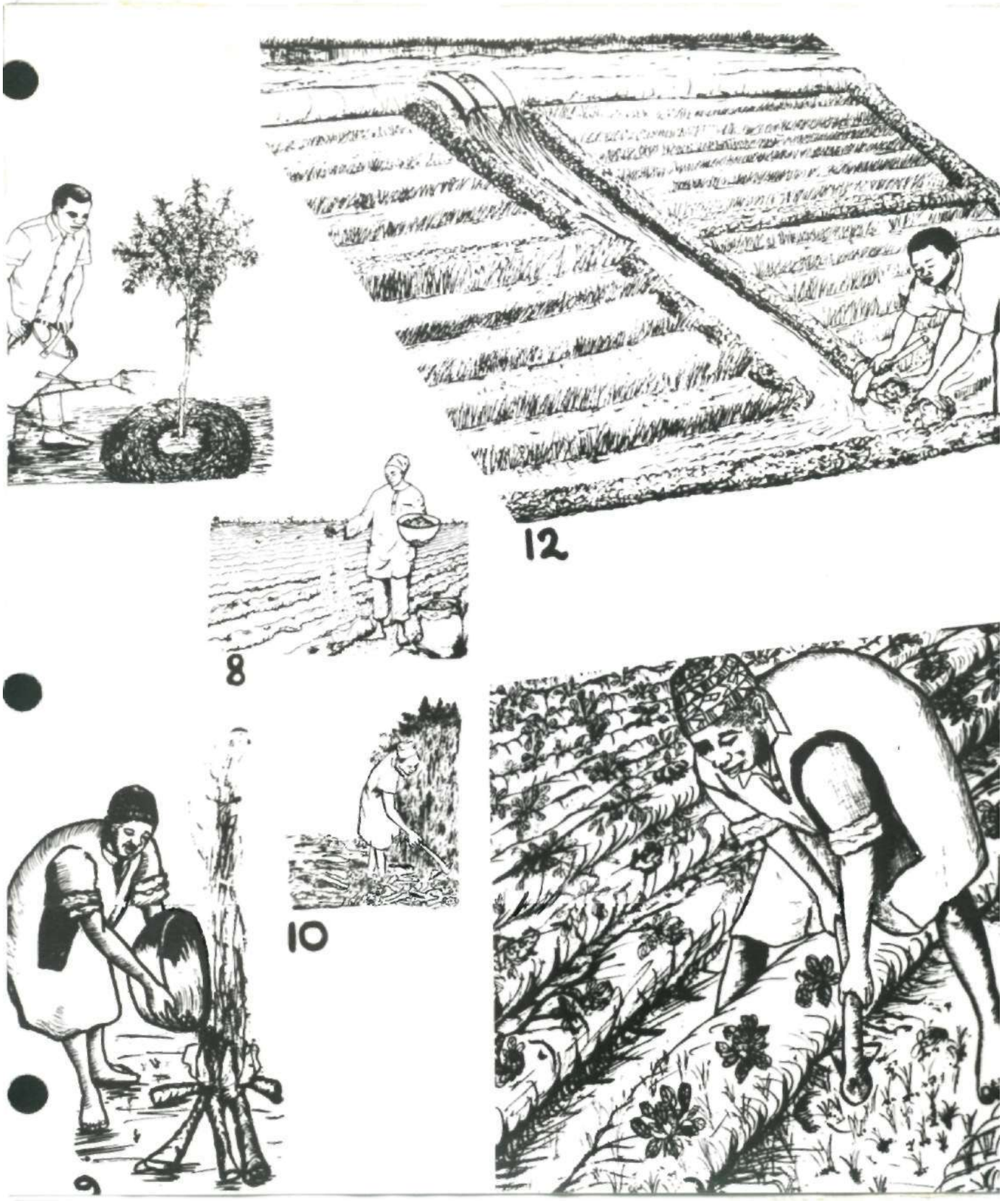
(S.1) Coloured symbols:- Multicoloured pictorial symbols for water, irrigation, fire, ridges, fertile soil, wealth and fertilizer were cut from A.E.R.LS. extension visuals and mounted on cardboards. It was hypothesized that a higher proportion of respondents will understand the coloured symbols more than the black and white ones.

(S.2). Black/white symbols: were similarly displayed. They depicted:- water, fertilizer, ridges, irrigation farming, and weeds. The symbols are pictured in plates XVI and XVII.

3.5. INTERVIEWER TRAINING

Three part-time assistants conducted the interviewing. Two had secondary school education; the third had a diploma in agriculture. They were trained through discussions, and practical demonstrations in mock interviews. They learnt the manner of approaching the village heads and respondents, recording responses, displaying the test visuals and respondents' selection.

I accompanied the interviewers on some trips to each village. On such visits, faulty interview processes, and problems were noted. The correct techniques were discussed with the assistants after the day's work to forestall repetition of mistakes.



xvi Black and white symbols.



XVII C o l o u r symbols

3.6. SAMPLE POPULATION

The sample for the main survey consisted of indigenous Hausa population residing in the study locations. These are Dakace, Dambo, Gangara, Rafin Yashi and DupaDupa villages. The villages were selected on the basis of their accessibility by motorable roads even during the wet season.

Some of the villages: Dambo, Dakace and Dupadupa, had been involved in extension activities while the remaining have not. Studies by Bogunjoko (1983) show that Gangara and Rafin Yashi have had only insignificant contact with extension workers. He found that their major source of agricultural information is the radio (ibid).

The sample population included 165 practising farmers, in the following age groups: below 30 years, 30 - 45 years, and above 45 years; the number of males interviewed were 147, and 18 females. Female staff in the Home Economics section of A.E.R.L.S., interviewed the female sample in Dupadupa village. The sample was limited to the above size to enable the study to be properly managed, and because of the paucity of funds and time. According to Zaria (1985), Hausa rural populations are homogenous. It is hypothesized that their homogenity will make the findings of this study to be applicable to a wider Hausa population in the area and elsewhere.

Selection of respondents was by systematic random sampling; every third person seen. The first is randomly selected among those available. Respondents were interviewed in places such as village head's house, ward-head's compound, village square, or any sheltered space near the market.

3.7. ADMINISTERING THE MAIN QUESTIONNAIRES:

The questionnaires were administered between May and July, 1986. Prior to this date, a permission letter was sought and obtained from the Zaria Local Government Secretariat, Zaria (attached, appendix B). It was addressed to all village wards and district heads. The letter was taken to the village head on the first day of visiting. Interviewers also briefed him on the purposes and acitivities of the survey. A suitable date was agreed upon by which time he would have informed majority of the people in his village about the research.

At the start of actual interviewing, groups of people found in the places specified above, were briefed about the study's objectives and the tasks for respondents. They were also admonished to give sincere responses and cooperation.

Test materials were placed on the floor, against the wall where subjects can have clear views of them. The three interviewers then interviewed the individuals, and filled their responses in the questionnaires. Discussions among respondents were not allowed. The situation always attracted other people who were also interviewed. The group approach was used, because of insufficient test visuals (some were out of print in AERLS), and secondly because of the problem of transporting the bulky test materials between the interview locations.

The interviewers worked together in the same area simultaneously. Use of group interviewing have been recommended by Hershfield et al (1976) and Arokoyo (1984); and was used by Yazidu (1973). According to Hershfield et al (1976), group interviewing has the advantage of enabling researchers to obtain group response to issues raised in the research. They argued that it agrees with the community spirit which is traditional to Indian, Asian and African societies; and it is more economical. They mentioned that other supplementary methods should be used.

3.8. SECONDARY INTERVIEWS

Agricultural Information Personnel:- The quesionnaire was administered to the participants at the agricultural information workshops of 1984 and 1985, held in A.E.R.L.S. Zaria. Of the 33; questionnaires returned, 31 were found useable, the remaining were poorly filled. Respondents are agricultural extension workers, whose job assignment covers agricultural information, or are in charge of agricultural information units in Ministries of Agriculture, River Basin Development Authorities, and Agricultural Development Projects in the Northern states.

The questionnaire asked: the uses of the visuals, situations of use, suggestions for improvements and the problems their audience had raised, or which they had noticed when using the visuals in the field. Thapur (1958) argued that field extension workers should participate in

evaluating extension visuals, since they know the rural people and the field problems best. They should also be consulted in production of visual aids. The visuals were displayed in front of the group. The questionnaires were then given out for completion. Discussions were disallowed during the period.

Communication specialists:- The questionnaires were filled by twelve communication specialists. These are A.B.U. staff members, who have five years or more experience in graphic arts and with degree qualifications in graphics. The size was limited to the above number because they were the people who satisfied the criteria, and who could be found within the scheduled period of July to August 1986 when this aspect of the study was done. The visuals had to be carried from one respondent to the other as there were no sufficient copies to give each person. The communication specialists rated the aesthetic level of the extension visuals selected from the pilot study. The factors used were: message conception, contrasts, clarity of content, draughtsmanship, simplicity and colour,. Scores of 0,1,2, or 3 for very poor, poor, fair or good respectively, were given each item. They were asked also to comment freely on the visuals. The communication specialists were interviewed in their offices. Each test material was displayed one at a time. The respondent recorded the appropriate scores as each was

displayed.

In addition to the above, discussions were held with villagers; extension and information staff of Ministries of agriculture, and Zaria Local Government agriculture division. These discussions centred on the utilization and problems of the extension visuals.

3.9. OPERATIONAL HYPOTHESES

(1) The proportion of respondents who achieve high understanding scores for naturalistic/realistic visuals will be significantly higher than for other types of visuals.

(2) Proportion of respondents who prefer naturalistic/realistic visuals will be higher than for other visuals.

(3) High rate of comprehension will be correlated with high aesthetic levels,

(4) There will be a significant relationship between levels of comprehension and age.

(5) Comprehension will be significantly related to occupation.

(6) Comprehension will be significantly related to literacy levels.

(7) Illiterates understanding will be related to the formats of the visuals.

(8) There will be a significant relationship between comprehension and exposure to extension visuals.

(9) Preferences will be significantly related to level of exposure.

(10) There will be a significant relationship between exposure and occupation.

(11) Attitudes to extension visuals will be correlated with occupation categories.

3.10. HOW DATA WAS ANALYSED AND HYPOTHESES TESTED:

The analysis was done with the S.P.S.S. statistical package of the Iya Abubakar Computer Centre, A.B.U., Zaria. This yielded frequency distributions of all variable scores, and contingency tables with chi-square analysis. Percentage frequency distributions were used to describe personal characteristics of rural respondents (age groups education, literacy levels, occupation, use of extension visuals, etc), for comprehension and preference scores of each visual as well as for reporting the responses of agricultural information personnel and communication.

The responses for comprehension, preference, exposure, use of visuals and other variables fell into discrete categories such as "correct" or "wrong" and "yes" or "no". In this case, the variables are nominal-scale variables, and according to Siegel (1956), Mueller et al (1970), and

Palumbo (1977), chi-square is an appropriate statistical test to use. The chi-square was used to check whether there's relationship between any two variables or not, and the significance level. Probability levels not greater than 0.05 were considered statistically singnificant, and reported at 0.05 or 0.01 levels. Siegel (1956), Mueller et al (1970) and Palumbo (1977) reported that it is customary in the social sciences, to fix the significance levels at 0.05 and 0.01. Where the chi-square level is significant, the research hypothesis is supported, otherwise it is rejected. The chi-square formular as given by Siegel (1956) and others, was used. It is as follows:

$$X^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(Oij-Eij)^2}{Eij}$$

where Oij =observed number of cases categorised in the i^{th} row of j^{th} column

Eij =number of expected cases in the j^{th} row of the j^{th} column

$\sum_{i=1}^{r} \sum_{j=1}^{k}$ =sum over all rows(r) and all columns(k)

The spearman rank correlatinn was used to determine the association between rural respondents' comprehension rate and aesthetics scores given by communication specialists The scores were ranked within these two variables, and subjected to spearmans correlation calculation. The formular used, given in Palumbo (1977), is as follows:

$$r = 1 - \frac{6\Sigma d^2}{n(n^2-1)}$$

where di = difference between each rank for the same case (or observation).

Σd^2 = Sum of the squared differences.

n = number of cases (or items) involved.

r = correlation coefficient.

The calculated coefficient in this study indicated if increases in comprehension rate of visuals, is associated with increases in aesthetic scores.

The Goodman and Kruskal's Tau was used where the former measures are not applicable (according to Siegel (1956), chi-square is valid only where not more than 20 percent of the cells in a contingency table, have expected frequencies below 5, and where all cell frequencies are greater than zero. Also spearmans correlation is applicable only for ranked data). According to Watson and McGaw (1980), Goodman and Kruskal's Tau, is a figure, indicating the strength of the relationship between an independent and a dependent variables, measured on the nominal scale. The formular, as given by Watson and McGaw (1980), is as follows:

$$\text{Tau} = \frac{Ey - \Sigma Eyx}{Ey}$$

where y = dependent variable data, X= independant variable data.

Ey = number of errors in predicting Y distribution with no knowledge of x.

$\sum Eyx$ = number of errors in predicting y distribution within each category of x variable.

Ey_i = $nyi\frac{(n-nyi)}{n}$ and n = sample size.

In the present study Tau measure was used to determine the strength of relationship between preference and comprehension as well as between visual category comprehension and exposure. According to Watson and Mc.Gaw (1980), a tau figure of 0.01, indicate that 1 percent of the variation in the dependent variable (e.g. comprehension) is accounted for by the independent variable (e.g. exposure). Similarly a figure of 0.5 indicates 50 percent, while 0.05 indicates that only 5 percent variation in the dependent variable is due to the independent variable. A Tau figure of 0.0 indicates absence of relationship (independence), while 1 indicates that 100% variation in the dependent, is accounted for by the independent variable (a perfect correlation) (ibid). In addition to the analysis, logico-deductive argument was employed when data warrants it, as mentioned by Palumbo (1977).

3.11. SUMMARY:

This chapter covered the processes employed in interviewing rural farmers, agricultural information and communication specialists, using extension visual test materials and questionnaires. The variables: comprehension, preference, exposure, use, literacy, attitude, and occupation; as well as their measurements, were discussed.

The operational form of the hypotheses and the statistical tools for testing them were given.

The next chapter deals with the analysis of data.

3.12. REFERENCES

Arokoyo, J.T. (1984). Personal interview, in A.E.R.L.S., A.B.U., Zaria. April and May 1984.

Bogunjoko, I.O. (1983) "Sources of Information on improved Farm practices. A study of farmers in Giwa District of Kaduna State". Nigerian Journal of Agricultural Extension, Extension, Vol.1:2, June 1983.

Duncan H.F., Gourlay, N., and Hudson, W.(1973) A study of pictorial perception among Bantu and White Primary School Children in South Africa, Withwaterstand University, Johannesbourg.

Fugglesang, Andreas (1973). Applied Communication in Developing Nations, Dag Hammanskjold Foundation, Sweden.

Hershfield, A, Niels G.R., Graham B.K., and Hursh-Cesar, G.(1976). "Problems in Interviewing". Third World Surveys. Survey Research in Developing Nations. Hursh-Cesar G. and Prodipto Roy (eds). MacMillian Company of India, Delhi.

Herzog, W., Stanfield, D, and Hursh-Cesar, G.(1976) "Problems in measurment", Third World Surveys. Survey Research in Developing Nations. Hursh-Cesar, G. and Roy, P (eds). MacMillian Company of India, Delhi.

Jegede, J.O. (1978) "An Investigation of Secondary School Students depth perception of line Diagrams used in Teaching of Biology". M.Sc. Thesis, A.B.U., Zaria.

_____(1985) Personal Interview, Faculty of Education, A.B.U., Zaria.

Hursh - Cesar, G. and Roy, P. (1976) "Problems of Sampling" Third World Surveys. Survey Research in Developing Nations. MacMillian Company of India, Delhi Pp.198, 207.

Mueller, J.H., Schuessler, K.F. and Costner, H.L. (1970). Statistical Reasoning in Sociology, (2nd edition)Houghton Mufflin, Boston.

Ogumbi, B. (1986) Lecture contact, A.E.R.L.S., A.B.U., Zaria, September, 1986.

Ogunduyile, S.R. (1985) "Aesthetic values of Hausa embroidered caps and Garments in Zaria - Nigeria", Unpublished M.A. Thesis, A.B.U., Zaria.

Palumbo, D.J.(1977) Statistics in Political and Behavioural Science (revised edition), Columbia University, New York.

Roy, P., Frederick, F.C., Niehoff, A.H., and Hursh-Cesar, G.(1976). "The Survey Setting" Third World Surveys. Survey Research in Developing Nations. Hursh-Cesar G. and Roy, P(eds), MacMillian Company of India, Delhi, Pp.56-59.

Siegel, S. (1956). Non-parametric statistics for the Behavioural Sciences. McGraw-Hill, New York.

Sokomba, Tsado J. (1977) "Reception, Understanding and use of Extension Publications by Extension Workers" M.Sc. Thesis, University of Wisconsin, Madison.

Thapur Romesh (ed.) (1958) Visual Aids in Fundamental Education and Community Development, UNESCO Paris.

Voh. J.P. (1979) An Exploratory Study of Factors Associated with Adoption of Recommended Farm Practices among Giwa Farmers. Samaru Miscellaneous Paper 73. I.A.R., A.B.U., Samaru, Zaria.

Watson, G. and Mc.Gaw, D.(1980) Statistical Inquiry. John Wiley and Sons, New York.

Yazidu, I.(1973)"The Study of Radio as a means of Communicating Agricultural Information to Farmers in Northern States of Nigeria" Unpublished M.Sc. Thesis, A.B.U., Zaria.

Zaria, M.B.(1984) "An Evaluation of the National Accelerated Food Production Programme Strategy for Increased Sorghum Production in Zaria L.G.A.". Unpublished M.Sc. Thesis A.B.U., Zaria.

_____(1985) Personal Interview; A.E.R.L.S., A.B.U., Zaria.

CHAPTER IV

4. PRESENTATION AND ANALYSIS OF DATA

This chapter presents the analyses of data gathered from: survey of rural people, and interviews with agricultural information personnel and communication specialists. The rural respondents sample size is 165, but eight questionnaires were rejected because many items were unanswered, or had unclear responses. Agricultural information and communication specialists who responded were 31 and 12, respectively.

The analyses are presented in three parts. The first is the rural respondents' personal characteristics, exposure and comprehension. Also, agricultural information personnels, and communication specialists' responses were presented. The second, deals with the relationships between the above variables using chi-square, and Goodman and Kruskal's Tau measures of association. The third is the data on use and its relationship with occupation and exposure.

PART I.

4.1. Majority of the rural respondents are between the following age groups: 20-30, and 31-50 years(see table 1). The main occupation is farming; 67.5 percent mentioned full-time farming as their occupation, 21.6 percent are part-time farmers having an additional traditional occupation, and

10.9 percent said they are part-time farmers but have a modern occupation (table 2). Those who have had 10 years or more farming experience, make up 72 percent of the sample (appendix A, item 6). The level of literacy in English is low (8 percent). Literates in both Hausa and Ajami make up 30.6 percent, an additional 21.4 percent are literate in Ajami only. Respondents who are not literate in any of the languages make up 40 percent of the sample (see table 3). A high proportion of the sample, 90 percent, attended koranic schools; 31.2 percent attended primary school while 28.7 percent - adult education classes (see appendix A, item 5).

Table 1

Rural respondents age groups

Age	Number	(Percent)
Below 19 years	14	8.9
20 - 30 years	52	33.1
31 - 50 years	67	42.7
Over 50 years	24	15.3

Table 2

Occupational categories

Occupation	Number	(Percent)
Full-time farming	106	67.5
Farming and traditional occupation	34	21.6
Farming and modern occupation	17	10.9

Table 3

Respondents literacy levels(in percent of N)

N = 157

Literacy category	Level attained			
	Fluent	Reads a Little	Illiterate	No response
Hausa	38.2	19.7	31.8	10.3
Ajami	39.5	21.0	29.9	9.6
English	8.3	7.6	74.5	9.6

	Number	(percent of N)
Literate in both Hausa and Ajami	48	30.6
Literate in Hausa, Ajami and English	13	8.0
Literate in Ajami only	33	21.4
Illiterates	63	40.0
TOTAL	157	100.0

4.2. EXPOSURE

The rural respondents' exposure to extension visuals is low. As represented in table 4, 55 percent saw/read posters and 36 percent saw/read leaflets before. In table 5, it can be seen that over 82 percent had never received any visuals before.

Table 4

Responses to the question: "Have you ever seen or read extension publications before?" (Responses are in percentages

N = 157

Types	Yes Read	Yes Seen	No Never	TOTAL
Agricultural extension posters	24.2	31.2	44.6	100
Farmers extension leaflet	10.2	26.2	63.6	100
Handbills	10.8	14.6	74.6	100
Flipbooks	10.2	4.4	85.4	100
Newspaper articles	13.4	6.4	80.2	100

Table 5

Publications respondents received

Types recieved	YES	Number of respondents(in percentages) No/no responses
Farmers extension leaflet	13.1	86.9
Posters	17.9	82.1
Handbills	7.9	92.1
Others	1.9	-

4.3. COMPREHENSION

Majority of rural respondents had high understanding of the extension graphic visuals. As represented in table 6 over 82 percent understood six of seven posters, and 73 percent or more understood four of six leaflets.

The highest correct responses was given for 'select best millet heads'(3.1.p.). Obtain N.A.C.B. loans

was misunderstood by the highest proportion of respondents. This may be due to the problem of interpreting the multiple images of the poster. Rabbit leaflet (5.2.L) was understood best (91.7 percent) among leaflets. Guineacorn production (38.5 percent) and Grain storage (87.9 percent) rank second and third respectively.

SYMBOLS COMPREHENSION

A high proportion of rural respondents understood the symbols. The analysis showed that over 75 percent understood five of seven colour symbols, and one of six black and white symbols (table 7). Further, in table 8, it can be seen that 83.5 percent and 79.6 percent had high comprehension of the colour and black and white symbols respectively. These also tend to indicate that coloured symbols were more easily understood than black and white. This finding supports East (1952), Nelson (1977) and Schiff's (1980) statements that colour makes for clarity and easier understanding.

In table 7, it can be seen that the colour representation for 'farm ridges' was comprehended by the highest number of respondents (88,6 percent). Its black and white version was the least understood (50.3 percent), probably due to absence of colours. Also the colour version of 'water' (Sla), was the least understood (43.3 percent). Its black and white version had high rate (74.5 percent).

The explanation for the former's result may be its poor 'gestalt'.

Table 6

Comprehension test scores according to visual categories

N = 157

Category	Responses (in percentages) Correct	Wrong	No Response
Naturalistic/realistic:			
(1.1.p) Dress Seeds with Aldrex 't'	86.0	7.0	7.0
(1.2.p) Obtain N.A.C.B. Loans	62.1	29.3	7.6
(1.4.L) Grain Storage	87.9	4.5	7.6
(1.5.L) G.corn production	88.6	2.5	8.9
(1.6.L) Citrus	73.9	17.8	8.3
All-outline:			
(2.1.p) Control poultry diseases	82.8	1.9	15.3
(2.2.L) Agric. Co-operatives	56.0	34.4	9.6
Single-image			
(3.1.p) Select best millet heads	88.5	1.2	10.3
Multiple panel:			
(4.1.p) Apply fertilizer on G.corn	86.5	3.8	9.7
(4.2.p) Balanced diet	86.6	10.8	2.6
Stylised/mixed:			
(5.1.p) Hybrid maize	80.3	12.7	7.0
(5.2.L) Rabbit production	91.7	3.2	5.1

P = Poster, L= Leaflet.

In table 8, it can be seen that there's no statistically significant differences between the levels of understanding of respondents having high or low exposure to extension visuals, at the 0.05 level. The explanation for this may be the simplicity of the symbols, or respondents' familiarity with the content, as studies by Centre for Educational Development Overseas (1969) and Omarri and Mc.Ginitie (1974) suggest .

Table 7

Symbols Comprehension

N = 157

Symbol	Responses(in percentages)		
	Correct	Wrong	No response
Colour (S1)			
(a) Water	43.3	54.2	2.5
(b) Fertile soil	75.4	22.7	1.9
(c) Money (wealth)	81.5	16.6	1.9
(d) Farm ridges	88.6	10.8	0.6
(e) Fertilizer application	80.3	18.1	1.6
(f) Maize plant	50.3	48.4	1.3
(g) Fire	83.4	15.3	1.3
Black/White(S2)			
(a) Fire	76.4	21.7	1.9
(b) Ridges	50.3	48.4	1.3
(c) Fertilizer	60.5	38.2	1.3
(d) Water	74.5	24.2	1.3
(e) Irrigated farm	61.1	36.9	1.9
(f) Weeds	61.8	36.3	1.9

Table 8

Relationship between symbols' Comprehension and exposure to extension visuals, by chi-square.

Total=157

Symbols type	Comprehension level	N(%)	Exposure level		Chi-square	Significance level
			High	Low		
Coloured	High	131(83.5)	65	66		
	Low	26(16.5)	11	15	0.22	NS
Black/ White	High	125(79.6)	56	69	2	
	Low	32(20.4)	20	12	2.53	NS

NS=Not significant, at 0.05 level

4.3.3. RELATIONSHIP BETWEEN SYMBOLS AND VISUALS' COMPREHENSION

In order to check if low understanding of symbols will affect the level of comprehension of the extension visuals, cross-tabulation of posters and leaflets by symbols comprehension levels was done (table 9). As represented in the table, there's no statistically significant relationship between both poster and leaflets' comprehension levels, and symbols comprehension levels at the 0.05 level. In this case, understanding of symbols does not determine level of comprehension of extension visuals.

Table 9

Relationship between comprehension levels of extension visuals and black/white symbols by chi-square

Total = 157

Visuals Comprehension levels	Level of symbols comprehension			Chi-square	Significance level
	High	Low	N		
Posters:					
High	104	28	132	0.05	NS
Low	20	5	25		
Leaflet:					
High	101	24	125	0.23	NS
Low	24	8	32		

NS = Not significant at the 0.05 level

4.4. VISUAL CATEGORIES AND COMPREHENSION

Do respondents understand naturalistic-realistic visuals more than the other categories? In order to answer this question, cross-tabulations of comprehension levels of each visual category by levels of exposure, literacy and occupation groups were done in tables 10, 21, and 22, (tables 21 and 22 are on pages 126-127). Comparing scores between each visual category in each table, it can be seen that naturalistic/realistic scores (high level) is greater than other visual category scores in all the tables. In table 10, respondents with "high" level scores for naturalistic/realistic is 89.8 percent, followed by single-image type

with 88.5 percent, and all-outline type with 85.6 percent. The hypothesis number one which says that naturalistic/ realistic will be better understood is supported.

Table 10

Relationship between visual category comprehension and exposure levels by Chi-Square.

Total N=157

Levels of visual category comprehension	N(%)	Exposure Frequency High	Low	Chi-Square	Significance Level
Nat/realistic					
High	140(89.8)	72	69	29	NS
Low	16(10.2)	4	12		
All-outline:					
High	136(85.6)	72	64	7.87	S(0.01)
Low	21(13.4)	4	17		
Single-image:					
High	139(88.5)	75	64	13.07	S(0.01)
Low	18(11.5)	1	17		
Mixed-stylised:					
High	123(78.3)	63	60	1.32	NS
Low	34(21.7)	13	21		
Multiple panel:					
High	121(77.1)	64	57	3.05	NS
Low	36(22.9)	12	24		

S = Significant, NS = Not significant at 0.05 level

4.5. EXPOSURE AND COMPREHENSION

Comprehension of single image and all-outline types are satistically significantly related to exposure levels, at P = 0.01, as given in table 10. The relationship is weak in both (Goodman and Kruskall's Tau-T, are 0.10 and

0.05 respectively). There are no significant relationship between the comprehension of the other visual categories and exposure levels. This finding is unexpected. Studies by Duncan et al (1973) and Fugglesang (1973) show that comprehension is related to exposure. The explanation for the present finding is that the high level of Koranic education (over 80 percent, in this study), and literacy in Ajami found in this area (supra p.10⌀) has made the population to be conversant with communication through symbols. This facilated their ability to interprete the visuals. Also according to Zaria (1984), agriculture is their main occupation; another explanation, may therefore be that familiarity with the agricultural scenes depicted in the visuals (from their everyday interactions with similar scenes in the predominantly farming environment), have led to higher comprehension. It can be concluded that the data available is insufficient to reject hypothesis number eight.

4.6. PREFERENCE

Rural respondents appear to prefer naturalistic/ realistic visuals, to the other types. As it can be seen in table 11, 47 of 157, and over 30 percent in four of five locations chose it above others. Outline type is second (chosen by 31 of 157). With the above result, hypothesis number two is upheld by the data. The results appear to support the findings of Duncan et al (1973).

Table 11

Proportions preferring the visual categories in each location

Total N = 157

"Best liked" visual category	N	Preference per location(in percentage) Dakace	Dambo	Gangara	R/Yashi	Dupa-Dupa
Naturalistic/ realistic	47	38.9	35.3	17.1	30.6	30.0
All-outline	31	27.8	14.7	24.4	11.1	20.0
Single-image	25	19.4	8.8	26.8	8.3	10.0
Multipanel	30	11.1	32.4	7.3	25.0	30.0
Mixed-stylised	24	2.8	8.8	24.4	25.0	10.0

The single "best liked" poster is "control poultry diseases' (2.1), as is shown in table 11. Next to this, is 'select best millet heads '(3.1). This may be due to the colour scheme (or attraction) of the posters. 'Select best millet heads' (3.1) was also the most frequently chosen as "most naturalistic/realistic" poster (chosen 20.4 percent of the times). These data tend to suggest that, considered singly, limited information type visuals were preferred over the others. In table 12, Guinea corn leaflet was chosen as "best liked" and "most naturalistic/realistic leaflet", chosen 30.6 percent and 35 percent times respectively.

Table 12

"Best liked" and "most naturalistic/realistic" visuals chosen by rural respondents

Visuals		Percent times chosen by respondents	
		Best liked	Most naturalistic/ realistic
Posters:			
(1.1.)	Dress seeds with Aldrex 'T'	12.1	18.1
(1.2.)	Join Agric. cooperatives for loans	7.6	4.5
(1.3.)	Raise Rabbits	8.9	10.2
(2.1.)	Control Poultry diseases	19.7	15.3
(3.1.)	Select best millet heads	15.9	20.4
(4.1.)	Apply fertilizer on G'corn farm	9.6	9.6
(4.2.)	Balanced diet	9.6	9.6
(5.1.)	Hybrid maize	15.3	6.4
Leaflets:			
(1.4.)	Improve Grain Storage	21.0	18.1
(1.5.)	Guineacorn production	30.6	35.7
(1.6.)	Citrus production	14.1	11.5
(2.2.)	Forming Agric. Cooperatives	19.1	13.4
(5.2.)	Rabbit raising	12.7	15.3

4.6.1. PREFERENCE AND COMPREHENSION

Does preference determine understanding? This was examined by cross-tabulating choices of "most naturaslistic/realistic" visual with comprehension levels (table 13).

The answer to the above question is no. In table 13, the relationships between leaflet or poster comprehension levels and preferences is weak.Goodman and Kruskal's Tau (T) for poster and preference is 0.04; for leaflet and preference, 0.04 and for colour symbols and preference, 0.00 (indicating absence of relationship).

It can be said therefore, that understanding did not depend on the realism and amount of details, of the pictorial representation. An item of the questionnaire revealed that the main reason rural respondents gave for their preferences was relevance of the message to needs'.

4.6.2. REASONS FOR PREFERENCES

Respondents were asked the reasons for their choices of 'best liked' visuals. The motive was to determine factors for use in designing alternative visuals as well as inferring design problems. It can be seen from table 14 that the most frequently given reason is " relevance of the message to needs" (66.5 percent), followed by "attraction"(59.9 percent), and thirdly, "clarity" (48.4 percent). Also in the table, naturalistic/realistic

visuals appear to be chosen because of "colour", more than any other reason.

Table 13

Preference of most naturalistic/realistic visuals and comprehension of visuals(using Goodman and Kruskal's Tau(T))

Comprehension Level	N	Preferences(times chosen)					
		Nat/ Real	All Outline	Multi Panel	Single image	Mixed/ Stylised	
Poster:							
High	132	46	21	27	28	10	T=0.04
Low	25	15	3	3	4	0	
Leaflet:							
High	125	44	22	24	25	10	
Low	32	17	2	6	7	0	T=0.04
Colour Symbols:							
High	131	50	20	9	25	27	
Low	26	11	4	1	5	5	T=0.00

T=Goodman and Kruskal's tau.

Table 14

The proportion of respondents giving particular reasons for their preferences(according to poster categories).

Reasons	Nat./ realis.	All Out-line	Multi-panel	Single image	Stylised mixed	TOTAL percent
Easy to understand	29.7	14.9	17.6	17.6	18.9	47.0
Content is relevant to need	29.8	15.4	15.4	19.2	19.2	66.5
Attraction	33.0	15.0	16.0	19.1	14.9	59.9
Draughtsmanship	34.1	11.0	16.4	16.4	20.5	46.5
Colourful	37.3	8.5	11.9	18.6	22.0	37.6
Clarity	36.8	9.2	15.8	18.4	18.4	48.4

4.7. AGRICULTURAL INFORMATION PERSONNELS' RESPONSES:

Agricultural information personnels' assessment of some visuals shows that "ease of understanding" scores were lowest (50 percent, 58 percent and 45 percent; in table 15). This implies that farmers will find the visuals difficult to understand. The agricultural information personnel's reasons for the responses given in the table were: absence of pictorial cues (that could have made for proper identification of message content) and difficult English captions (due to technical terms). Their general assessment (table 16) supports the above reasons (appropriateness of pictorial content was scored 67.5 percent).

Table 15

Agricultural information personnel's assessment of some visuals based on design factors.

N=31

Design Factors	Responses (in percentages)					
	Apply fertilizer on Guineacorn		Grain Storage		Observe Cotton close season	
	Yes	No	Yes	No	Yes	No
Ease of understanding	50	35	58	28	45	35
Attraction	70	13	66	13	54	29
Draughtsmanship	62	17	58	21	50	25

Table 16

Agricultural information personnel general assessment of extension graphic visuals

Factors		Percent total score
(1) Message	=	71.0
(2) Appropriateness of pictorial content	=	66.7
(3) Draughtsmanship	=	75.0
(4) Colour use	=	71.0
(5) Presentation	=	74.4

4.8. COMMUNICATION SPECIALISTS' RESPONSES:

Communication specialists assessed four posters and three leaflets on the basis of contrast, simplicity, message conception (content clarity), visibility, attraction, draughtsmanship and appeal. As it can be seen in table 17, communication specialists rated "select millet heads" poster highest of all (mean score - 23.8). Next is "control poultry diseases" (22.8) and third, "Rabbit raising" (22.3). "Guineacorn production" mean score of 22.8, is the highest among leaflets. This is followed by Grain storage" (21.8) and "Agricultural Cooperatives" (19.5).

Table 17

Communication specialists scoring of design qualities of posters and leaflets

Design Quality	Total scores							
	Rabbit raising (P)	Poultry Control (P)	Millet heads (P)	Hybrid Maize (P)	G'corn Production (L)	Grain storage (L)	Agric Co-op. (L)	G'nut Diseases (L)
Contrast/Visibility	25.0	25.0	25.0	14.0	26.0	25.0	19.0	19.0
Simplicity	25.0	24.0	26.0	18.0	25.0	26,0	22.0	23.0
Message Conception	21.5	24.0	22.0	14.0	22.0	22.0	21.5	19.5
Attraction	24.0	23.0	25.0	15.0	23.0	22.0	19.0	17.0
Draughtmanship	17.0	18.0	21.0	14.0	17.0	17.0	16.0	17.0
Mean total score per visual	22.3	22.8	23.8	15.0	22.8	21.8	19.5	19.1
Percent mean score	74.3	76.0	79.3	50.0	76.0	72.7	65.0	63.7

Maximum mean score = 30

P = Poster L = Leaflet.

4.9. AESTHETICS AND COMPREHENSION

Would aesthetically high visuals be understood by more rural respondents, than low aesthetic types? To examine this issue, the extension visuals understood by the highest and least number of respondents were assessed by communication specialist

(supra, p.95). The respondents' comprehension scores and the communication specialists' assessments were then compared (table 18) and spearman rank correlation used to check the association between the two scores.

The answer to the earlier question is yes; more rural respondents understood aesthetically high visuals. In table 18, comprehension rate tends to be strongly correlated with aesthetic scores (the spearman coefficient, rs=0.75). Hypothesis three is supported by this data. Horchberg's (1972) contention that aesthetically high visuals are easier to understand tends to be given support.

Table 18

Relationship between comprehension and aesthetic scores using spearman rank correlation

Visual	Comprehension score(in percentages)	Aesthetic scores mean(percent)
1.5L Guineacorn Production	88.6	22.8(76.0)
3.1P Select Best Millet Heads	88.5	23.8(79.3)
1.4L Grain Storage	87.9	21.8(72.7)
2.1P Control poultry diseases	82.8	22.8(76.0)
5.1P Hybrid maize	80.3	15.0(50.0)
2.2L Agric. Co-operatives	63.7	19.5(65.0)

Spearman coefficient, $r_s = 0.75$

PART II

4.10. PERSONAL CHARACTERISTICS AND COMPREHENSION:

In tables 19 and 20, it can be seen that comprehension is not statistically significantly related to age and occupation. Also poster comprehension is not statistically related to farming experience. Leaflet comprehension is statistically significantly related to farming experience. Here respondents with 16 to 30 years experience have higher rate than the other categories. The explanation for this is that they are in their prime, are more literate, and thus probably are more committedto studying the leaflets more closely; than the other categories. Leaflets, carry sequential pictures with captions. This may be difficult for illiterates to understand. Illiterates constitute the majority of respondents with 30 or more years of farming experience. The hypotheses numbers four and five, which postulate relationship between age, occupation and comprehension are rejected.

From the table also, it can be seen that poster and leaflet comprehension levels are statistically, significantly related to literacy at 0.01 level. The tables tend to indicate that the more languages respondents are literate in, the greater the comprehension level they can attain. Respondents, literate both in Hausa and Ajami (simultaneously) had higher scores than the others. This may be interpreted to mean that the indigenous and more traditional languages are easier to understand and preferred for use as captions. This is supported by the homophilli theory of Rogers and Sheomaker

(1971) which states that communication is more effective when 'source' and 'receiver' are alike, than when dissimilar. The earlier inference on the relationship between comprehension and literacy levels is supported by the theory that multiple media is more effective than single medium in communication (ibid).

Hypothesis number six, which states that literacy will be significantly related to comprehension is upheld by the above data.

Table 19

Relationship between poster comprehension and respondents' personal characteristics (using chi-square)

Total N=157

Characteristics:		Comprehension level		chi-square	Significance level
	N	High	Low		
Age: under 30 yrs.	66	54(81.8)	12(18.2)		
31-50 "	67	57(85.1)	10(14.9)	0.51	NS
above 50 "	24	21(87.5)	3(12.5)		
Literacy:					
Illiterates	63	41(55.1)	22(44.9)		
Ajami only	33	32(97.0)	1(3.0)	28.61	S(0.01)
Hausa and Ajami	48	47(97.9)	1(2.1)		
English(all)	13	12(92.3)	1(7.7)		
Occupation:					
Full-time farming	106	92(86.8)	14(13.2)	1.23	NS
Part-time farming	51	40(78.4)	11(21.6)		
Farming experience:					
Under 15 yrs	55	43(78.2)	12(21.8)		
16-30 "	60	53(83.3)	7(16.7)	2.30	NS
Above 30 "	42	36(85.7)	6(14.3)		

S=Significant, NS=Not significant at 0.05 level

Table 20

Relationship between personal characteristics, of rural respondents and leaflets' comprehension levels using Chi-Square

Total N=157

Personal characteristics	N	Comprehension levels High%	Low%	Chi-square	
Age:					
Under 30 years	66	57(86.4)	9(13.4)		
31-50 "	57	50(74.6)	17(25.4)	3.2	NS
Above 50 "	24	18(75.0)	6(25.0)		
Literacy:					
Illiterates	63	36(57.1)	27(42.9)		
Ajami only	33	30(90.9)	3(9.1)	33.4	S(0.01)
Hausa and Ajami	48	47(97.0)	1(2.1)		
English	13	12(92.3)	1(7.7)		
Occupation:					
Full-time farming	106	87(82.1)	19(17.9)		
Part-time Farming	51	38(67.6)	13(32.4)	0.79	NS
Farm experience:					
Under 15 years	55	44(80.0)	11(20.0)		
16-30 "	60	55(91.7)	5(8.3)	13.49	NS
Above 30 "	42	26(61.9)	16(38.1)		

S = Significant NS = Not significant at 0.05

4.II LITERACY AND FORMATS

It was hypothesized that comprehension of the different literacy groups will be influenced by formats of the visuals. Literate and illiterate respondents scores for the different visual categories were compared (see table 21). The lowest scores by Ajami literates and illiterates are in the

multipanel category. Ajami literates' score is 78.8 percent and illiterates' - 58.7 percent. Hausa and Ajami (combined) group, and English literates scores for same category are 95.8 and 92.3 percent respectively. Also illiterates' highest score, of 77.8 percent was got in the single-image category. The data tend to indicate that illiterates and Ajami literates have difficulty with multiple panel visuals. Fugglesang (1973) found that single image visuals (or block-outs) were easiest to understand for an Ethiopian rural sample. N.N.D/ UNICEF (1976) study found that rural people do not understand comic strip formats and visuals with multiple images. The above findings support hypothesis number seven which predicts relation between literacy and formats of visuals.

Table 21

Relationship between visual category comprehension levels and Literacy levels

Total N = 157

Visual category comprehension levels		N	Percentage frequency response per literacy group			
			Illiterates	Ajami only	Hausa & Ajami	English
Naturalistic/ realistic:	High	141	76.0	100.00	100.00	92.3
	Low	21	23.8	0. 0	0. 0	7.7
All-outline:	High	136	73.0	100. 0	93. 3	92.3
	Low	21	27.0	0. 0	6. 3	7.7
Single Image:	High	139	77.8	97. 0	95. 8	92.3
	Low	18	22.2	3. 0	4. 2	7.7
Multiple:	High	121	58.7	78. 8	95. 8	92.3
	Low	36	41.3	21. 2	4. 2	7.7
Stylised/ mixed	High	123	61.9	87. 9	89. 6	92.3
	Low	34	38.1	12. 1	10. 4	7.7

factors of experience, exposure and occupation do not affect respondents' choices. Hypothesis number 9 which predicts significant relationship between exposure and comprehension is not upheld by the data.

Table 23

The relationship between preferences and experience, occupation and exposure levels by Chi-square

N=157

Personal characteristics	Nat/ real	Preference (in terms of times chosen) All-Outline	Multi-panel	Single image	Styli-sed/ Mixed	Chi-Square
Farm experience						
Below 15 yrs.	14	11	11	6	13	
16-30 "	17	13	13	8	9	12.30 NS
Over 30 "	16	7	6	11	2	
Occupation:						
Full-time farming	34	21	18	17	16	
Part-time farming	13	10	12	8	8	1.30 NS
Exposure level:						
High	9	11	9	10	5	5.14 NS
Low	38	20	21	15	19	

NS = Not significant at 0.05 level

4.13. PROBLEMS OF DESIGN

Rural respondents who gave wrong answers to comprehension test items were asked to indicate "agree", "disagree" or "not sure" to some test statements. The statements were grouped under perception and interpretation of pictorial representation, A frequency distribution of their responses

(correct or wrong) according to literacy (viz.illiterate or literate) was done, and reported in table 24.

Table 24

Frequency distribution of responses to perception and interpretation test statements - tabulated under correct and incorrect responses and literacy categories

Test Statement	Correct		Incorrect		TOTAL
	Lit.	Illit.	Lit.	Illit.	
Interpretation:					
(1) Dress seeds with Aldrex 'T' poster(1.1) shows seeds being poured together with Aldrex 'T' into a gourd(true)	1	1	1	9	12
Picture Perception:					
(2) Hybrid maize poster(5.1) tells how to apply fert-ilizer(false)	0	2	8	9	19
(3) N.A.C.B. Poster (1.2) shows a farmer who got loan(true)	15	27	3	3	48
(4) Improved storage leaflet -(1.4)(false)	0	1	1	6	8
(5) Guinea corn production(1.5) leaflet teaches how to grow yams (false)	1	0	2	5	8
(6) Citrus prod. leaflet (picture 6) shows how to apply fert. (false)	4	4	10	12	30

Lit = Literacy; Illit. = Illiteracy;

Item 1: The analysis of the responses to the statement on the "Dress seeds with Aldrex "T" poster, as represented in table 24, under interpretation, reveals that ten of twelve respondents misinterpreted the operation carried in the poster. The difficulty appears to be their inability to relate the pouring of Aldrex 'T' into the gourd, and the seeds carried by the farmer. Nine of ten illiterates gave wrong responses.

Item 2: In the table, it can be seen that 17 of 19 respondents agreed with the statement that the Hybrid maize poster tells how to apply fertilizer (a false statement). Eight literates and nine illiterates, of 19, gave incorrect responses. This may be due to the several meanings that can be made of the picture contect.

Item 3: Responses to the statement: the N.A.C.B. poster shows a farmer who had obtained loan ; indicate that 42 of 48 gave correct responses. This high rate appears to be due to the clues in the test statement which prompted the respondents to understand. This confirms findings of Daniels (1966), Deregowski et al (1972) and Sikandra (1986) who reported that when even a small explanation is given to rural people on the contents of a picture, their understanding increases. Item 4: six of eight respondents misunderstood picture 1 of the leaflet - "improved grain storage". The representation was probably

ambiguous.

Item 5: seven of eight did not correctly identify the guineacorn drawing. Five of the seven were illiterates. Some called the guineacorn representations yams.
Item 6: The citrus leaflet was misunderstood by the highest number of respondents (22). Here, about an equal number - 10 literates and 12 illiterates misinterpreted picture 6, which shows a farmer watering his plant. The water representation seems to have a poor "gestalt". Fugglesang (1973) wrote that images having a strong "gestalt" was better understood by majority of Ethiopian rural people, than others with weak "gestalt". According to Horchberg (1972), in the gestalt theory's law of organisation, the brain tends to give the simplest interpretation to an image. For images to have a strong "gestalt" they should display a continuous contour or edge, regular pattern, a persistent symmetry, and a clear three dimensionality. Because they possess simple characteristics, the brain can interprete such images clearly.

Agricultural cooperatives leaflet was understood by a low proportion of respondents. This may be due to lack of appropriate pictorial cues (that can call to mind the popular notions of cooperatives) or because the layout is too busy, as observed by some communication specialists.

Agricultural information personnels' and communication specialists' responses when asked to comment generally, on the visuals design and message.

All their comments were taken. Similar ones were grouped together under appropriate subtitles. They are given below:

(1) Drawings: "Drawings should go direct to the point"; "figures should show action"; "Portray farmers in rich clothings to make them look wealthy" "control poultry disease posters' drawing of human faces can be misinterpreted because there are too many lines". Improve the drawings of small leaflets".

(2) Clarity: "Cover illustration of the agricultural cooperative leaflets do not clearly show cooperative activities. The hybrid maize poster is unclear, its caption does not explain the arrows depicted in the poster".

(3) Emphasis: The leaflet on raising rabbits (5.2.L) picture three, did not specify how to take care of pregnant rabbits, even though its caption suggests that. "Drawing of gammalin 'A' sachet in picture four, of storage leaflet, should be bigger, because it is the main message, and needs to be emphasized".

(4) Captions: An extension staff of the Zaria L.G.A. secretariat said "the Ajami captions are difficult, find the version understood by the majority of farmers".

Another said: those who read them often come back to complain of difficult technical terms". "Revise the information frequently, some are outdated".

(5) Size: "Increase the sizes of the leaflets and posters. Illiterates prefer bigger visuals. Bigger visuals have better impact".

The communication specialists' assessments reveal that a minimum socre of 75 percent was given to six of eight visuals, for "simplicity"; four of eight, for "attraction"; and only one of eight for "message design" and draughtsmanship. This further confirms the problem of message design and draughtsmanship.

PART III

4.14. USE OF EXTENSION VISUALS:

Rural respondents saw/read the visuals mainly outside their villages, as table 25 tends to indicate. More than 43.3 percent saw the visuals for the first time during agricultural shows, open days and field trips. This agrees with agricultural information personnel's responses (table 25). In the table, the least mentioned rural respondents' sources are "in the village" mentioned by 35.5 percent, and farm centres, 34.4 percent.

Table 25

Places rural respondents were exposed, and situation in which agricultural information personnel use extension visuals

Places/Situations	Responses(in percentages) Yes	No/No responses
Rural respondents:		
Agricultural shows	47.6	52.4
Open days and Field days	43.3	56.7
Farmers meetings	38.5	61.1
On walls/in the village	35.5	64.5
Farm service centres	34.4	65.6
Others	24.2	75.8
Agricultural information personnel:		
Field days, open days	63.0	37.0
Farmers advicing	47.0	53.0
Extension workers training	41.0	59.0
Agricultural shows	38.0	62.0
Farmers meetings	34.0	66.0
Others(campaign tours, Television programmes, etc).	19.0	81.0

Analysis given in tables 4 and 5 (supra p.107),reveals that rural respondents who saw and read the visuals number 55 percent and 37 percent respectively. More than 82 percent never received any visuals before. From these data it appers that rural respondents' exposure to the extension visuals is low. One can also say that the visuals do not reach majority of farmers in their villages.

The rural respondents received the visuals mainly from agricultural extension workers. This was mentioned by 19.1 percent. Another 14.6 percent mentioned the village head. These figures are low.

Discussions with agricultural information personnel and extension workers in Kaduna Agricultural Development Project, Funtua area, reveals that zonal headquarter officials distribute visuals to district and village level extension staff, and through these to villagers. All interviewed claimed to distribute the publications or use them, in other ways at different times within the past two years.

The agricultural information staffs' leaflet and poster use are listed in table 26. Fertilizer application seem to be the most frequently used. The visuals most frequently mentioned by rural respondents is guineacorn production (mentioned by 45.2 percent), while 72.2 percent of agricultural information personnel mention fertilizer application. Groundnut production, fertilizer application, cotton, seed dressing, Grain storage methods and yam production each was mentioned by not more than 26.1 percent of rural respondents. The least seen visual is "grain storage method" (mentioned by only 14.1 percent). These rural respondents percentages are low indicating, probable low use by agricultural extension workers.

Table 26

Some visuals respondents saw and read,compared.

Subject/topics	Percentage of responses			
	Rural respondents		Agricultural information	
	Yes	No	Yes	No
Guineacorn production	45.2	50.3	66.6	33.4
Maize "	3.1	52.9	66.6	33.4
Groundnut production	26.1	70.7	69.0	31.0
Fertilizer application	17.2	79.5	72.2	27.8
Cotton	21.7	79.2	=	=
Seed dressing	14.6	82.2	69.0	31.0
Grain storage methods	14.1	82.2	=	=
Yam Production	=	=	53.8	46.2

= not tested.

4.15. EXPOSURE AND OCCUPATION:

In table 27, exposure and occupation categories were cross-tabulated, to reveal the categories reached most frequently with the visuals. A high proportion (88.2 percent) of the part-time farmers who have a modern occupation, have the highest exposure, followed by full-time farmers (48.1 percent). Part-time farmers with traditional occupation are the least exposed (29.4 percent). There is a statistically significant relationship between occupation categories and exposure levels at 0.01 level. The hypothesis number 10, is upheld by this study's data. The explanation is that modern occupation category have more access to the visuals because their occupation take them out of their villages to local government offices, agricultural institutions and similar places where visuals

are available.

Table 27

Relationship between exposure and occupation categories, by Chi-square

Total N=157

Exposure levels	Occupation Categories		
	Full-time farming N (percent)	Mod.occupation & part-time farming N (percent)	Traditional Occup. & Part-time farming N (percent)
High	51 (48.1)	15 (88.2)	10 (29.4)
Low	55 (51.9)	2 (11.8)	24 (70.6)

Chi-square X^2 = 15.71, df=2, Significant at 0.01 level

4.16. WHAT RURAL RESPONDENTS DO WITH THE INFORMATION THEY GET FROM THE VISUALS

In the data in table 28, 17.3 percent keep the visuals after receiving them, 11.5 percent read them and 13.4 percent paste them on their walls. In table 29, 56.7 percent apply the information in their farming activities. Further, 26.3 and 17.8 discuss the information with other farmers and relatives.

The figures are low. The reasons for this appear to be the high proportion of respondents who had never received any visuals before (about 80 percent - supra P.106) and possible interviewer errors.

Table 28

What rural respondents often do with the visuals

Responses	Percent responding		
	Yes	No	No response
Read them	11.5	31.2	57.0
Keep them	17.3	24.7	57.0
Paste them on walls	13.4	29.3	57.3
Give away to others	5.7	37.3	56.0
Destroy them	1.3	42.7	56.0

Table 29

Rural respondents use of the information:

Responses	Percent responding		
	Yes	No	No response
Discuss with farmers	26.3	50.3	22.3
Discuss with relations	17.8	58.6	23.5
Apply the information	56.7	19.7	23.5
Do nothing	4.5	73.2	22.5

4.17. ATTITUDES TOWARDS THE VISUALS

Majority appear to show favourable attitudes towards the extension visuals. As is shown in table 30, majority in each occupation and farm experience categories, said the visuals are useful for their farming. The proportion of respondents who opined that the visuals are useful, are 62.2 percent among full-time farmers, 100 percent among those with an additional modern occupation, and 55.9

percent among those with traditonal occupation. These appear to uphold hypothesis number 11, which predicts relationship between occupation and attitudes. Among respondents having five to thirty years farming experience, 63 to 72.7 percent said the visuals were useful for their farming activities. The proportion of those with over 30 years experience giving the same response is 59.5 percent. These data tend to support the conclusion of Bogunjoko (1983) that younger farmers have greater disposition to rely on the media for agricultural information, than older farmers (who rely on experience). In addition, the finding of the present study tends to be given support by Zaria (1984), who wrote that farmers in Zaria area are favourably disposed to accepting ideas that can increase their agricultural production. Voh (1987) expressed a similar idea.

Table 30

Opinions expressed by rural respondents according to occupation and farming experience

N=157

Categories	Responses (in percentages of N)		
	Yes, useful	Not sure	No/dont know
Occupation:			
Full-time farming	62.2	3.8	34.0
Farming and modern occupation	100.0	0.0	0.0
Farming & modern occupation	55.9	2.9	41.2
Farm experience:			
Under 5 years	63.6	23.0	13.4
10 - 15 years	72.7	0.0	27.3
16 - 30 years	71.0	3.3	25.7
Over 30 years	59.5	2.4	38.1

Rural respondents' positive attitude towards extension visuals can also be inferred from the responses to the questionnaire item which asked them to comment generally on the visuals. Typical comments are put in quote in table 31, and the number who gave such comments.

Table 31

Responses of rural people when asked to "comment generally" on the extension visuals

	Comments	Frequency
1.	"The governments should produce more and distribute to reach all villages Build a store in each village to distribute these things".	18
2.	"Give farmers to put on their walls for benefit of others".	20
3.	"Produce more posters. Posters are better: images are clearer, and bigger"	12
4.	"Why don't we get these publications? Before, we get them through the village head, and the extension worker, when one was here".	11
5.	"Leaflets should be as colourful as the posters".	2
6.	"The posters and leaflets are useful. They are instructive to farmers.	
7.	"Produce visuals on vegetables, fertilizer application, livestock, and irrigation".	9
8.	"Previous leaflet size is alright".	1

Total responses = 79.

Two workers with the Zaria Local Government said that visuals are usually given to farmers associations in the area, who use the visuals in adult literacy classes.

One opinion was that many farmers do not use the visuals rightly, since they merely paste them on walls for decoration. In Dakace village, people called the interviewers "paper farmers" (masu noman takarda). In table 32, comments given by respondents who rated other issues more important than extension visuals, are listed. Not all respondents answered the questionnaire item whose responses are listed in tables 31 and 32, and some people gave more than one response. Most of the comments favoured extension visuals

Table 32

The needs rural respondents mentioned in their general comments

Comments	Frequency
1. "Not every one can read, what we need are demonstration farms, where all farmers can learn improved techniques".	6
2. "What we really need is agricultural loans, more fertilizers and other inputs".	28
3. We need agricultural extension workers".	10
TOTAL =	44

4.18. REFERENCES

Arnheim, R. (1969), Visual Thinking, University of California, Berkeley.

_____,(1974), "Virtues and Vices of the Visual Media" Media and symbols Olson, D.R.(ed) 73rd Yearbook of the National Soc. for Study of Education, Chicago.

Bogunjoko, I.O. (1983), "Sources of Information on Improved Farm practices" Nigerian Journal of Agricultural Extension V1.1:2. June, 1983 p.65, 66.

Centre for Educational Development Overseas (Inc. OVAC) (1969), Visual Symbols Survey. Cited in Fugglesang, Andreas (1973): Applied Communication in Developing Countries. Dag Hammarskjöld Foundation, Sweden.

Deregowski J.B. (1972), "Pictorial Perception and Culture" Scientific American. V1. 227(5), 82-88.

Deregowski, J.B., Mouldrow, S. and Mouldrow, W.(1972), "Picture Recognition in a Remote Ethiopian Population", Perception. 1; 417-425.

Duncan, Hall, Gourlay N., and Hudson, W.(1973) A study of pictorial perception among Bantu and White children in South Africa, Withwatersrand University, Johannesbourg.

East, Marjorie (1952); Display for learning. Dryden, New York.

Feldman, E.B., (1971); Varieties of Visual Experience, Henry N. Abrams, New York.

Fugglesang, Andreas (1973): Applied Communication in Countries, Dag Hammarskjold, Sweden.

Horchberg, Julian (1972) "The representation of things and people". Art, percention and Reality,M.Mandelbaum (ed) John Hopkins. Baltimore.

Lakshmana Rao, R.V. (1975), "Mass Media in Society, Lessons from Research. Reports and Papers on Mass Communication (No. 65), UNESCO, Paris.

National Development Service of Nepal/UNICEF (1976), "Communicating with Pictures" in Development Communication Report No. 52. 1985.

Nelson, Paul R. (1977), Design of Advertising, Wm.C. Brown, Dubuque, Iowa.

Omarri, I.M. and Mc.Ginitie, W.A.(1984)"Some Pictorial Artifacts in the studies of African Children" Child Development Vol. 45, 2, 538 June, 1974.

Rogers, E. and Shoemaker, F.(1971). Communication of Innovation. The Free Press, New York.

Voh, J.P. (1987). Personal Interview Department of Agricultural Economics and Rural Sociology, A.B.U., Zaria, March, 1987.

Yazidu, I. (1973), "The study of Radio as a means of communicating Agric. Information" M.Sc. Thesis, A.B.U., Zaria.

Zaria, M.B. (1984), "An Evaluation of the National Accelerated Food Production Programme Strategy for Increased Sorghum Production in Zaria, L.G.A.", M.Sc. Thesis, A.B.U., Zaria.

CHAPTER V

5. SUMMARY OF FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This chapter presents a summary of this study's objectives, methods and proceedures. The findings from the data are presented next. Conclusions and implications, based on the findings, as well as recommendations for future research are also presented.

5.1. SUMMARY:

The problem of this study lies in the factors associated with comprehension and use of extension graphic visuals in agricultural information, among literates and illiterates in rural areas.

OBJECTIVES OF THE STUDY

(1) To find out the extent farmers understand the pictorial contents of each category of extension visuals, and other test items.
(2) To discover respondents' preferences of the visual categories.
(3) To relate respondents' personal characteristics and comprehension.
(4) To document problems of design and suggest alternative design concepts.
(5) To determine the extent respondents' use the visuals and their information

The methodology of the study was as follows: questionnaires, including 15 extension graphic visuals

and test materials, were administered to 165 rural people in Zaria area. Supplementary data were obtained from interviewing 31 agricultural information personnel and other communication specialists. The analysis was done using: (1) frequency distributions and (2) Chi-square, Spearman's rank correlation, and Goodman and Kruskal's Tau to check the degree and strength of relationship existing between the variables.

5.2. FINDINGS ON COMPREHENSION

The greater proportion of rural respondents had high understanding of the extension visuals. Over 82 percent understood six of seven posters, and 73 percent or more, understood four of six leaflets. Coloured symbols were understood by more respondents than black and white symbols. Over 75 percent understood five of seven coloured symbols, while the same proportion understood only one of six black and white types.

Naturalistic/realistic category was significantly understood more than the other pictorial categories. The least understood was multipanel category. The single poster, understood by the highest proportion of respondents was "Select best millet heads". The least understood was "Obtain N.A.C.B. loan". The leaflet with the highest understanding rate was "Raise rabbit", and that with the least understanding is "Agricultural Cooperatives".

High comprehension rate tended to be associated with high aesthetic visuals (Spearman's rank correlation between the two variables was 0.75).

Other findings:- The relationship between comprehension of visuals and preferences was weak (Goodman and Kruskal's Tau in each case was 0.04, indicating only 4 percent joint variation shared by the two variables Comprehension of symbols was independent of preferences (Tau = 0.00). Similarly no relationship was found between comprehension of symbols and visuals.

5.3. FINDINGS ON PERSONAL CHARACTERISTICS AND COMPREHENSION

There was no statistically significant relationship between comprehension of visuals and age. Similarly no statistically significant relationship was found between comprehension and occupation. No statistically significant relationship was found between comprehension of posters and farm experience.

Comprehension of leaflets was found to be statistically, significantly related to farm experience. Farmers having 16-30 years experience had higher comprehension rate than the other categories.

Statistically significant relationship was found between comprehension of visuals and literacy levels (at 0.01 significance level). Literates had significantly higher comprehension rate than illiterates.

Respondents who are simultanously literate in Hausa and Ajami tended to have higher comprehension rate than the other literacy categories. (This finding is contrary to expectations. The English literates were expected to have had higher comprehension than the other categories. This is because literacy in English carries with it skills in interpreting three dimensional representations and other types of pictures; unlike Ajami literacy in which education involves calligraphy and little of pictures. The finding may be due to the test instrument used for measuring literacy. It may not have gone far enough in sorting out the literates in English. The finding needs re-investigating). Literate and illiterates understanding tended to be related to the visuals format. Illiterates and Ajami literates tended to find multiple panel visuals difficult to understand.

Comprehension of all outline and single-image visuals were statistically significantly related to levels of exposure to extension visuals. However, no statistically significant relationship was found between comprehension of other visuals categories (multipanel, mixed-stylised, naturalistic/realistic), all symbols, and exposure levels.

5.4. FINDINGS ON PREFERENCES:

Rural respondent's most preferred pictorial category is the naturalistic-realistic. Preference

scores for naturalistic/realistic, was significantly higher than for others, in all locations. The single leaflet most preferred over others, is "Guineacorn production" chosen 30.5 percent of the times. For posters, the most preferred was "control poultry diseases", chosen 19.7 percent times. Since this poster is classified under limited information category, the finding seems contrary to that on pictorial categories. This result may have been due to the colourfulness of the poster.

No statistically significant relationship was found between preferences and exposure, similarly none was found between preferences and farm experience, and occupation categories.

The main reason rural respondents gave for their preferences was relevance of the message of visuals to their farm operations. The other reasons they gave were: attraction, clarity and ease of understanding, in that order.

5.5. FINDINGS ON PROBLEMS OF DESIGN

The analyses indicated that misinterpretations were due to: (a) Ambiguity:- "Hybrid maize" poster and "improved" storage" leaflet were misunderstood because of the ambiguous drawings in them. (b) Message design:- Pictorial representation did not clearly depict message.

Picture four of the "improved grain storage" leaflet was not easily comprehended because of this factor. Further, clues to recognising agricultural operation (or crop), that can give specific meanings are absent in some visuals. Poor draughtsmanship:- Depictions of certain objects (e.g. water, water flow) in black and white, for, easy understanding by illiterates is a problem. The communication specialists' assessments, reveal that visuals were rated high for "simplicity, and attraction, but low for "message design" and draughtsmanship.

(c) Multiple panel, and multiple images were difficult for illiterate respondents to understand. The cause may be that they have difficulty in integrating the various images, and their meanings into a unified whole, as Deregowski (1972) suggests, (d) Small size of illustration in the leaflets may lead to weak impact. (e) Captions in Ajami and English were found to be difficult to understand because of the technical terms they carry. (f) Complexity - The composition of some leaflets were too busy; "Agric. Cooperative" leaflet was found to confuse some rural respondents probably for this reason.

5.6. FINDINGS ON UCB:

A high proportion of respondents (over 45 percent) had never seen extension visuals before.

Over 80 percent had never received any. A statistically significant relationship was found between exposure levels and occupation (at the 0.01 level of significance). Full-time farmers, and those with traditional occupation had less exposure, compared to part-time farmers with modern occupation. Rural respondents see guineacorn and maize production posters more than for other subjects. Agricultural information personnel most frequently used: fertilizer application, groundnut production and seed dressing posters, in their extension work.

The visuals are more frequently available during farm tours, field days, agricultural shows and meetings than at other times. The visuals are seldom available in village head's house, in the market area of walls in the village. Of those who had seen or recieved the visuals, only 20.7 percent mentioned a village source. Rural respondents who had been exposed keep the visuals, discuss the contents with others and apply the information in their farming activities.

Majority of the sample hold positive attitude to the visuals. However, it appears that the older the farmer, the less interest they show in the visuals as a source of agricultural information. The general comments of rural respondents further demonstrate their positive attitudes to extension visuals. The comments include requests to the government to: produce greater quantity of the visuals, undertake wider distribution to reach large

number of farmers, and to publish more visuals on cattle rearing, land preparation, irrigation and fertilizer application.

5.7. CONCLUSIONS

Based on the findings listed above, the following conclusions are reached:

(1) A significantly higher proportion of respondents understood naturalistic-realistic type visuals more than other categories. Coloured visuals appeared to be understood and preferred more than black and white. Also the symbols in extension visual were understood by all categories of respondents.

(2) More respondents tended to prefer naturalistic/realistic visuals above other categories. When the posters are considered singly, there appeared to be only little difference in preferences between the naturalistic/realistic and limited information types. Comprehension tended to be statistically independent of preferences. Realism of pictures did not determine level of comprehension.

(3) Comprehension rate tended to be correlated with aesthetic level. Simplicity in visuals tends to be an important factor associated with higher understanding.

(4) Levels of comprehension were found to be statistically related to literacy categories. Rural respondents who are literate simultaneously in Hausa and Ajami tended to have higher comprehension more than others. Comprehension of leaflets was associated with farm experience. Literate and illiterate respondents' level of comprehension of visuals was found to be associated with the type of format of the visual. Literates significantly understood single image and all-outline posters more than illiterates. Illiterates, Ajami literates and those having traditional occupation tended to have difficulty understanding multipanel and stylised-mixed categories.

(5) The hypothesis that comprehension levels will be statistically, significantly related to exposure, age and occupation has not been supported by the data of this study.

(6) Relevance of the visuals' message to rural peoples' agricultural activities, appeared to be an important design factor in arousing their interest.

7. Problems of the visuals include the following:- (a) ambiguity, (b) pictorial content:- here pictorial content doesnot often identify the message carried by the captions, (c) complexity of design; some leaflets' designs were too busy. (d) poor draughtsmanship (e) smallness of some leaflet illustrations, which may lead to weak impact (f) difficult captions.

8. Exposure of rural respondents to agricultural extension visuals is low. The visuals are not distributed to reach the majority of the farmers in their villages. The farmers receive the visuals on rare occasions, and outside their villages. However they want the visuals, and hold favourable attitudes toward the medium. This conclusion is supported by UNICEF/NND(1976) study's finding that rural people want visuals as a medium of communication, and by Zaria (1984) and Voh (1987) who stated that farmers are favourably disposed to ideas that can enable them increase their agricultural production.

5.8. IMPLICATIONS

The following recommendations are based on the above findings and conclusions; and on personal experiences during the conduct of the study. They may have practical application to: the production and distribution

of agricultural extension visuals; and dissemination of agricultural information to rural people.

A.E.R.L.S. and other producers of extension visuals should work in conjuction with adult education institutes to produce simplified extension visuals which will be used simultaneously in adult literacy classes as suggested by Chineme (1981). According to her, farmers' functional literacy will be enhanced. The objective of this approach is to use the occupation of rural people as subject content and base, on which all the knowledge to be taught will rest.

More agricultural information agencies should be involved in producing and distributing the visuals, since farmers have shown interest in them. However, only important messages, relevant to their farming activities should be published.

Message design: a pictorial representation of the subject content should be carried as recognition clue on posters. On leaflets one panel should carry the clue.

An alternative, smaller sized leaflet is suggested (see 2.2.L), for literates. The version was conceived on the basis of economy. A second alternative (2.2.SL), has larger, sequentially arranged pictorial representations. This can be directed to illiterates and semi-literates.

Ajami calligraphy could be used to design posters, with Hausa (roman lettering) as sub-titles. The design emphasis could be placed on the beauty of the arabic calligraphy. Ajami and Hausa captions could be combined in the same visual. Similarly English and any one Nigerian language could be carried together on the same poster. This is for reason of economy. Captions in Hausa, and English need to be simplified. The meanings of technical terms should be given in brackets after the terms. One way of ensuring that captions and pictorial content are understandable and relevant, is to carry out small scale pilot testing in a nearby village. A simple method that can be used is panel judgement but it can be combined with interviews.

Pictorial content: Single-image (or block-out) type pictures should be used on posters. The treatment can be naturalistic/realistic. Simplicity should be the major factor to be considered in designing all the visuals. The use of abstract or stylised pictorial representation appears unsuitable.

Distribution and use:- The federal government should instruct companies that supply agricultural chemicals and fertilizers to display pictorial instructions of the methods of using the products on the packages. Rogers and Shoemaker (1971) wrote that product labels was one medium of diffusion of technical

information in the U.S.A.

In addition, more distribution channels should be utilised, so that greater number of rural people are reached. The following are suggested: local governments, adult literacy centres, youth clubs, farmers societies and training centres, farm service centres, and ministries of information.

This study has indicated that few extension workers appear to use the visuals. Therefore, the visuals need to be publicised among the workers to encourage their use. Radio and Television programmes can incorporate discussions on extension visuals as done in the Gambia according to Sikandra (1986).

5.9. RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the findings of this study, the following recommendations are appropriate:

(1) Similar studies should be conducted in remote rural areas in other states. Rigorous sampling techniques, semantic differential methods and multivariate regression analysis should be used. This would reveal greater intricacies in the relevent variables employed. The test visuals to be used should include equal numbers in each category, as well as commercial agricultural product labels, brochures and posters.

(2) Illiterates' preferences and comprehension of different colour schemes: monochromatic, analogous, simultaneous contrast, two-colours, etc should be investigated more thoroughly.

(3) The variables of aesthetics, preferences and comprehension could be used in investigating the relationships between interests and learning. This in turn, may reveal how visual design principles can be used, through graphic visuals, to affect the behaviour, and traditional practices of rural people socially and economically.

REFERENCES

BOOKS:

Akinbode, A. (1976) "Making Research more Relevant to Policy Making", Research and Public Policy in Nigeria. Suleimanu Kumo and Abubakar Aliyu (eds.), Department of Research and Consultancy, Institute of Administration, A.B.U., Zaria.

Arnheim, R. (1969), Visual Thinking, University of California, Barkeley. Pp. 137, 140, 143, 151.

_____(1974), "Virtues and Vices of the Visual Media". Media and Symbols Olson, D.R.(ed) 73rd Yearbook of the National Soc. for Study of Education, Chicago. Pp. 186, 193, 197.

Baikie, Adamu (1981), "Keynote Address Delivered at the Opening of the Agricultural Information Workshop". Agricultural Information Workshop Proceedings: October, 18-23, 1981. A.E.R.L.S., A.B.U., Zaria.

Bulloughs, Robbert (1974) Creating Instructional Materials (2nd edition). C.E. Merill, Columbus, p.106.

Centre for Educational Development Overseas (Inc. O.V.A.C.) (1969), Visual Symbols Survey, cited in Applied Communication in Developing Countries, Fugglesang, A(1973), Dag. Hammarskjold, Sweden.

Chineme, P.O. (1981), "Adult Education and Rural Development. Focus on farming communities".. Agricultural Information Workshop Proceedings. A.E.R.L.S., A.B.U., Zaria, October, 18-23, 1981.

Coppen, Helen (1972) "A Survey of British Research in Audio-Visual Aids 1945-1971 National Committee for A-V, Aids in Education, London.

Cupchick G.C. and Henriches R.W. (1981) "Towards an Integrated theory of Aesthetic perception". Advances in Intrinsic Motivation and Aesthetics, Plenum, New York, 1981, p.468, 475, 480.

Défever, A. (1977) "Integrated Development Support Communication". Communications Policy for National Development. Routledge and Kegan Paul, London.

Duncan, H.F., Gourlay N., and Hudson, W. (1973) "A study of pictorial perception among Bantu and white primary school children in S. Africa. Withwatersrand University, Johannesbourg, Pp. 5, 43, 44, 83, 16-126.

East Marjorie (1952), Display For Learning. The Dryden press, New York, Pp. 5-12, 65, 66, 78-79, 100.

Feldman, E.B.(1971) Varieties of Visual Experience Harry N. Abrams, New York. Pp. 78-79; 80-93.

Fugglesang Andreas (1973) Applied Communication in Developing Countries. Dag Hammarskjold, Sweden.

Gombrich, E.H. (1962) Art and Illusion Phaidon Press, London, p. 187, 196, 223, 275, 267.

_____(1972) "The mask and the face: The perception of physiognomic likeness in life and art". Art, Perception and Reality. M. Mandelbaum (ed), John Hopkins, Baltimore.

_____(1974) "The Visual Image", in Media and Symbols Olson, D.R. (ed), 73rd yearbook of the National Society for the Study of Education, Chicago.

Hagen, M.A. (1978) "An outline of an investigation into the special character of pictures" Modes of perceiving and processing Information Herbert P. a d E. Saltzman (eds) Lawrence Elbaum, New Jersey.

Habber, R.N. et. al (1973) The Psychology of visual perception Holt Rine Hart and Winston, New York.

Hershfield, A. Niels, G.R. Graham, B.K. "Problems in interviewing" Third World Surveys-Survey Research in Developing Countries. The Macmillian Company of India Ltd., Delhi.

Herzog, W., Stanfield, D, and Hursh-Cesar, G. (1977) "Problems in measurement". Third World Survey-Survey Research in Developing Countries. Mac-Millan company of India Ltd., Delhi.

Horchberg, Julian (1972) "The Representation of things and people. Art, Perception and Reality. M. Mandelbaum (ed). JohnHopkins University, Baltimore. Pp. 72-76, 254-270.

Horn F. George (1976) Contemporary posters. Davis Publications, Worcester, Massachusaets.

Kaupelis, R.(1966) Learning to Draw. Watson-Guptil Publications, New York. p.139.

Kennedy, M. John (1974) "Icons and Information". Media and Symbols-The Forms of Expression, Communication and Education Olson D.R. (ed) 73rd Yearbook of the National Society for the study of Education, Chicago.

Khalil, I.A. (1981) "Report of Extension Demonstration Unit in Kano State Ministry of Agriculture and Natural Resources". Agricultural Information Workshop Proceedings A.E.R.L.S., A.B.U., Zaria. 18-23 October, 1981.

Kidder, L.H. (1981) Sheltiz, Wrightsman and Cooks Research Methods in Social Relations (4th edition). Holt, Rinehart and Winston, New York.

Kingman Lee (ed) 1978, Illustrators Notebook, The Horn Book Inc. Boston, Pp. 11-12, 13, 16.

Laskmana-Rao, R.V. (1975) Mass Media in Society No 65; Lessons from Research, UNESCO. Paris P.9, 16, 40, 43.

Mueller, J.H., Scheussler, K.F. and Costner, H.L.(1970). Statistical Reasoning in Sociology (2nd edition) Houghton Mifflin, Boston.

Nelson, Paul Roy (1977). Design of Advertising, Wm. C. Brown Co. Dubugue, Iowa. Pp. 179-180, 182-183, 268-273.

Pausenwang, Siegfried (1973)'Methods and Concepts of Social Research in a Rural Developing Society, Welform-Verlag. Munchen.

Palumbo, D.J.(1977) Statistics in Political and Behavioral Science(revised edition), Columbia University, New York.

Rogers, E. and Shoemaker, F. (1971). Communication of Innovation The Free Press, New York, Pp. 14-15, 205-208, 209, 262-263.

Roy, P, Frederick S.F. Niehoff, H.A. (1976) "The survey setting", Third World Surveys-Survey Research in Developing Countries, MacMillian Company of India Ltd., Delhi, P. 56, 57-59.

Shawki M.B. (1974) "Integrated Communication Experience, in Kenya. "Integrated Communication. Bringing People and Rural Dev. together East-West Communication Institute, Honolulu, p. 117.

Schiff Williams (1980) Perception: An Applied Approach, Houghton Mifflin, Boston: P333, 325, 334.

Sigel E. Irving (1978) "The Development of Pictorial Comprehension" Visual Learning, Thinking and Communication Academic Press, London, Pp.99,95,100.

Siegel, S. (1956) Non-parametric Statistics for the Behavioural Sciences. New York. Mc. Graw-Hill.

Thapur Remesh (ed) (1958) Visual Aids in Fundamental Education and Community Development. UNESCO Regional Seminar in East Asia, UNESCO Paris. 7.

Trowell Margaret (1960) African Design, Faber and Faber, London.

Voh, J.P. (1979), Study of Factors Associated with Adoption of Recommended Farm Practices among Giwa Farmers, Samaru Miscellaneous Papers 73, I.A.R., A.B.U., Zaria.

Watson, G. and Mc. Gaw, D.(1980), Statistical Inquiry, John Wiley and Sons, New York.

Williams S.K.T. (1968) Sources of Information on Improved Farming Practices in some Selected areas of Western Nigeria. University of Ife, Extension Education and Rural Sociology Dept., Research Monograph, No. 5, June, 1968.

Yazidu, I. (1976), "Public Communication and Results" in Research and Public Policy in Nigeria, Suleimanu Kumo and Abubakar, A. (eds), A.B.U., Zaria. Pp. 259-262.

JOURNALS

Adkins, Gale R. (1983). "Formative Evaluation in Educational Radio and Television. A Fundamental need in Developing Countries". Development Communication Report: 44, December, 1983.

Bogunjoko I.O. (1983) "Sources of Information on Improved Farm Practices. A study of farmers in Giwa District of Kaduna State". Nigerian Journal of Agricultural Extension vl. 1:2. June, 1983-p65,66.

Collins L-Belinder and Pierman, C.B. (1979) "Establishing ways to decide whether people understand symbols". Industrial Design, July/August, 1979. pp49.50.

Deregowski J.B. (1972), "Pictorial Perception and Culture" Scientific American. V1.227(5).

Deregowski, J.B., Muldrow, S. and Muldrow, W.(1972), "Picture Recognition in a Remote Ethiopian Population", Perception. 1; 417-425.

Gombrich, E.H. (1972) "The Visual Image", Scientific American V1. 227(5), 82-88.

Hudson, W. (1960), (1967) "The study of the problem of pictorial perception among unaccultured groups" International Jnl. of Psychology 1967, 2, 89-107 cited in Modes of perceiving and processing information. Herbert, L.P. and Elliot, s.(eds.) (1968) Lawrence, E. Associates, New Jersey,37.

Igunnu, J.B. (1976), "How Agric. Information is backstopping the Operation Feed the Nation". A.E.R.L.S. Newsletter, Jul, 1976.

National Development Service of Nepal/UNICEF(1976) "Communicating with Pictures" Development Communication Report, No. 52, 1985, Winter.

Ochi Horoshi (1957) "Concrete and Abstract Presentment in Posters", International Poster Annual. 1956/57 p.8.

Omarri, I.M. and MoGinite, W. A. (1974). "Some pictorial Artifacts in Studies of African Children", Child Development: June, 1974, Vol. 45, No.p.538.

Perreton Hillary (1985) "Agric. Extension and Mass Media "Development Communication Report; 44, 1985, December.

Sikandra, S. (1986) "Improving Visual Comprehension in Non-literates", Development Communication Report, Autumn, 1986, 55, 10.

Trent C. and Kinlaw R. (1979) "Comic Books: An Effective Teaching Tool", Journal of Extension VI XVII. Jan/Feb. 1979.

William, G.R. (1956/57) "How to get better 24-sheet posters" International Poster Annual 1956/57.

Zimmerman, M. and Steckel, L. (1985) "Formative Research: Pretesting, Revising and more Pretesting". Development Communication Report Autumn, 1985, No. 51, Pp. 9, 12.

UNPUBLISHED CONFERENCE PAPERS AND THESIS

Aboderin, A.O. (1978), "Book Production in Nigeria; The role of the graphic artist". M.A. Thesis, A.B.U., Zaria.

Ajakaiye, M.B. (1978) "Problems of Extension in Agriculture Forestry, Livestock and Home Economics". Paper delivered at the National Seminar on Transfer of Research Results N.S.T.D.A., Moor plantation, Ibadan.

_____ (1980) "The Role of Educational Technology in Agricultural Extension". Paper delivered at the N.A.V.A. convention, Zaria, Kaduna State, May, 1980.

Arokoyo, J.T. (1981), "Diffussion and Adoption of Recommended Agricultural Practices in the Ten Northern States of Nigeria "Unpublished Ph.D., Thesis. University of Wisconsin, Madison.

Daniels, C.B. (1966) "A case study of knowledge transfer in the Gusau Extension project, Nigeria" Unpublished M.Sc. Thesis, Kansas State University, Manhattan, Kansas.

Gana, F.S. (1975) "An Evaluation of package Result Demonstrations in Villages with and without field Demonstrations in Minna, Nigeria". Unpublished M.Sc. Thesis, Kansas State University, Manhattan. Kansas. Pp. 65.

Igunnu, J.B. (1978) "Utilization of Agric. Films and Slides by County Agents in Wisconsin". M.Sc. Thesis University of Wisconsin, Madison, P.3.

Jegede, J.O. (1978) "An Investigation of Secondary School students depth perception of Line Diagrams used in teaching of Biology. M.Sc. Thesis, A.B.U., Zaria.

Nwerri, I.O. (1980) "Agricultural Communications in Nigeria, Inception and Development" Paper presented at the 2nd N.A.F.P.P. Communications Workshop, May, 1980, Zaria.

Ogunduyile, S.R. (1985) "Aesthetic values of Hausa Embroidered Caps and Garments in Zaria, Nigeria", Unpublished M.A. Thesis, A.B.U., Zaria.

Sokomba, Tsado Jonathan (1977). "Reception, Understanding and use of Extension Publications by Extension Workers in Nigeria M.Sc. Thesis University of Wisconsin, Madison.

Yazidu, Imrana (1973) "The Study of Radio as a means of Communicating Agricultural Information to Farmers in Northern States". Unpublished M.Sc. Thesis, A.B.U., Zaria.

Zaria, M.B. (1984) "An Evaluation of the National Accelerated Food Production Programme strategy for Increased Sorghum Production in the Zaria L.G.A., M.Sc. Thesis, A.B.U., Zaria.

OTHER REFERENCES:

Arokoyo, J.T. (1984) Personal interview; April and May,1984.

Duncan, Hall F. (1964?) Experimental Research design for Evaluation of African Reaction to cartoons. Indiana University, Bloomington, Training Handout (n.d.)

E.R.L.S. (1963/64) Extension Information File, ERLS/REP.11/1, Monthly Activity Report, 1963.

Jegede, Johnson (1985), Personal Interview, Faculty of Education A.B.U., Zaria, April and May, 1985.

Voh. J.P. (1987), Personal Interview, Department of Agricultural Economics and Rural Sociology, A.B.U., Zaria, March, 1987.

Zaria, M.B. (1985, and 1986) Personal Interview, A.E.R.L.S., A.B.U., Zaria.

APPENDIX A.

COMPREHENSION AND USE OF AGRICULTURAL EXTENSION POSTERS AND LEAFLETS; QUESTIONNAIRES FOR RURAL RESPONDENTS IN DAKACE, DAMBO, RAFIN YASHI, GANGARA AND DUPADUPA

PART 1

Personal Characteristics(Biographic data)

INSTRUCTION: FILL IN THE BLANKS, OR TICK YES OR NO, ACCORDINGLY:

1. Number_____ 2. Age_____

2. Sex: Male_____ Female_____

4. Are you a full-time farmer? Yes_____ No_____ (1)

- If No, what major work do you do?

(a.)	Teaching	Yes_____	No_____ (2)
(b.)	Village Head/Ward Head	_____	_____ (3)
(c.)	Cloth Weaving/Embroidery	_____	_____ (4)
(d.)	Messenger/Labourer/Local Government Worker	_____	_____ (5)
(e.)	Koranic Mallam	_____	_____ (6)
(f.)	Petty Trader	_____	_____ (7)
(g.)	School Pupil/Student	_____	_____ (8)
(h.)	Others (Specify)	_____	_____ (9)

5. Have you attended any of the following schools before?

		Yes	No
(a.)	Primary School	31.2%	68.8%
(b.)	Koranic School	91.7	8.3
(c.)	Secondary/Teacher's College	9.6	90.4
(d.)	Adult Education Classes	28.7	71.3

6. How many years have you been farming?

(a.) 9 Years or less	20.0%	1
(b.) 10 - 15 Years	7.0%	2
(c.) 16 - 30 "	38.2%	3
(d.) Over 30 years	26.8%	4
(e.) No response	7.6%	0

7. Have you ever seen the following types of publications before?

Yes_____ No____

(INTERVIEWER SHOULD SHOW EACH TYPE TO RESPONDENT)

(IF NO, SKIP TO QUESTION 15).

(ii) Which have you ever seen or read?

	1. Yes, Read it	2. Seen it only	1. No, Never seen it
(a.) Agric. Extension posters	_____	_____	_____
(b.) Farmers Handbills	_____	_____	_____
(c.) Agric. Extension Handbills	_____	_____	_____
(d.) Flipbooks(Flipcharts)	_____	_____	_____
(e.) Newspaper articles on Agric.	_____	_____	_____

8. How often do you see the publications? (TICK ONE)

(a.) Always	1.3%	4
(b.) Sometimes	57.1%	3
(c.) Rarely	9.6%	2
(d.) Never	15.9%	1
(e.) No response	26.1%	0

9. If you have seen Agric. Extension posters, and Leaflets before, where did you see them?

		1. Yes	2. No.
(a.)	At Agricultural shows	___	___
(b.)	At open days and Field days	___	___
(c.)	On house walls in the village	___	___
(d.)	Market place	___	___
(e.)	At farmers society meeting/Young Farmers Club meeting halls	___	___
(f.)	Farm service centre where you buy Fertilizer, Chemicals and other farm inputs	___	___
(g.)	In a friends house	___	___
(h.)	Others (Specify)	___	___

R E C E P T I O N

10. Have you ever received any Extension publications (e.g. Posters, Leaflets, Guides, etc.) before?

1. Yes___ 2. No___

(IF NO, SKIP AND GO TO QUESTION 15)

11. Which of these have you received before?

(TICK AS APPROPRIATE)

		1. Yes	2. No
(a.)	Pictorial leaflet	___	___
(b.)	Posters	___	___
(c.)	Handbills	___	___
(d.)	Others specify _____		

12. How often do you receive the publications?

		(TICK ONE).
(a.) Quite often	0.0%	3
(b.) Not so often	29.0	2
(c.) Raely	1.9	1
(d.) No response	69.1	0

(13.) From whom did you receive the publications?

	1. Yes	2. No
(a.) Agric. Extension worker	___	___
(b.) Village head	___	___
(c.) Fellow Farmer	___	___
(d.) Relations (brother, Parents children)	___	___
(e.) School Teacher	___	___

14. USE:

After receiving and learning from Extension posters leaflets, Guides, etc., what do you most often do with them?

	(TICK AS APPROPRIATE) Yes 1.	No 2.
(a.) Destroy them	___	___
(b.) Keep them	___	___
(c.) Read them in the future	___	___
(d.) Paste them on the house wall	___	___
(e.) Give them away to other people	___	___

15. What do you most often do with the information you get from Extension Posters, Leaflets, Guides, etc.?

		1. Yes.	2. No.
(a.)	Discuss with other farmers and friends	___	___
(b.)	Discuss with relatives	___	___
(c.)	Apply information on the Farm	___	___
(d.)	Do nothing	___	___
(e.)	Not applicable	___	___

16. If you have seen Extension Posters and Leaflets, before, which of the following subject-topics did you see?

		1. Yes	2. No.
(a.)	Guineacorn production	___	___
(b.)	Maize production	___	___
(c.)	Cotton planting	___	___
(d.)	Groundnut planting	___	___
(e.)	Fertilizer application	___	___
(f.)	Seed dressing	___	___
(g.)	Grain Storage	___	___
(h.)	Others (Specify below)	___	___

O P I N I O N S

17. Will these Agricultural Extension Publications (Posters, Leaflets etc.) help you to understand more about improved Agricultural Practices?

(a.) Yes ___ 4

(b.) Not sure ___ 3

(c.) No ___ 2

(d.) Don't know ___ 1

L I T E R A C Y

18. SHOW EACH POSTERS LISTED BELOW. AFTER EACH IS SHOWN, ASK RESPONDENTS TO READ THE CAPTIONS. THEN TICK THE SPACE THAT BEST DESCRIBES HIS ABILITY.

		3 READS VERY WELL	2. READS A LITTLE	1 CANNOT READ AT ALL
(a.)	Poster 1/1P Hausa	_____	_____	_____
(b.)	Poster 1/1P/ Ajami	_____	_____	_____
(c.)	Poster 1/1P English	_____	_____	_____

PART II

COMPREHENSION TEST QUESTIONNAIRE

INTRODUCTION:

INTERVIEWER SHOULD FIRST SHOW THE APPROPRIATE POSTER. THEN GIVE OUT THE RELEVANT HANDBILL AND LEAFLET TO THE RESPONDENT. THE RESPONDENT SHOULD BE GIVEN ABOUT 10 MINUTES TO LOOK THROUGH EACH POSTER OR LEAFLET, BEFORE THE QUESTIONS ARE READ OUT. HOW TO FILL THE REPLIES GIVEN:

(1.) TICK(/) ONE OF THESE AS APPROPRIATE -

AGREE; NOT SURE; DISAGREE

(2.) IN SOME QUESTIONS, YES OR NO ARE USED.
HERE ALSO, TICK (/) ONLY ONE AS APPROPRIATE.

19. SHOW POSTER 11 (DRESS SEEDS WITH ALDREX 'T').

1. What do you see in this poster?

	1.	2.
	—— Yes	—— No
	_____	___Dress-ing seeds
	____	___Using Aldrex'T'

		Agree	Not sure	Disagree
(11.)	a. The poster tells you to use Aldrex 'T' to get better germination of seeds	____	_____	PC. ___3,2,1
	b. The seeds will be poured together with Aldrex'T' into the gourd	____	_____	1 ___ 3,2,1

20. POSTER 2.1 (CONTROL POULTRY DISEASES)

1. What do you see in this poster?

_____ YES _____NO.(Vaccination of chickens)

(a.) This poster shows veterinary doctor vaccinating chickens _____ _____ _____ PC.

(b.) The chickens will all be vaccinated _____ _____ _____ 1.

(c.) The poster tells you to vaccinate your chickens to prevent diseases _____ _____ _____ C.

21. POSTER 3.1. (SELECT BEST MILLET).

i. What is the message of this poster?

YES NO (Plant good millet seeds)

Agree Not sure Disagree
3. 2. 1

(ii)(a.) The poster shows a farmer holding good millet seeds _____ _____ _____ PC.

(b.) The poster tells you to plant good seeds in order to get bumper harvest _____ _____ _____ 1

(c.) The Farmer plants good millet seeds every year _____ _____ _____ 1

22. POSTER 4.1. (APPLY FERTILIZER ON G/CORN FARM)

(i.) What is the message of this poster?

1. 2.

YES NO.

_____ _____(Applying Fertilizer)

_____ _____(Harvesting)

(ii.)(b.) The farmer in top picture is making ridges. Agree ___ Not sure ___ Disagree ___ PC.1.3 3.

(c.) The high yield of Guinea-corn was due to the use of Fertilizer ___ ___ ___ 1.3. 2.1.

23. POSTER 4.2.(BALANCED DIET: HOME ECONS.)

(i.) What do you see in this poster? 1. Yes 2. No

___ ___(Good for the family)

___ ___(Types of food) PC.

The poster shows: - Agree Not sure Disagree PC.

(ii.)(a.) Types of food necessary for good health. 3. 2. 1.

(b.) Everybody should eat from each category of the foods ___ ___ ___ I.

24. POSTER 5.1 (HYBRID MAIZE)

What is the message of this poster?

(i.) Yes___ No___ (How to plant Hybrid maize)C

Yes___ No___ (High yield will result if correct production methods are followed when growing Hybrid maize)

1. 2.

(ii.) (a.) Farmer planting maize seed ___ ___ ___ PC.3,2,1

(b.) If you plant Hybrid Maize, you will get high yield ___ ___ ___ 1.3,2,1.

(c.) Apply Fertilizer after making ridges ___ ___ ___ PC 1,2,3

25. SHEET S.1. (SYMBOLS-COLOURED.)

What do you see in this sheet?

(RESPONDENT SHOULD IDENTIFY EACH ITEM. THEN WRITE ITS NUMBER IN THE BLANK SPACES).

		Number (1,2, or 3 etc.)		
(a.)	Water	____	____	1. 2.
(b.)	Fertile soil	____	____	1. 2.
(c.)	Money	____	____	1. 2.
(d.)	Farm ridges	____	____	1. 2.
(e.)	Fertilizer being applied	____	____	1. 2.
(f.)	Maize plant	____	____	1. 2.
(g.)	Fire	____	____	1. 2.

26. SHEET S.2. (SYMBOLS) (FILL AS IN ABOVE - QUESTION) (BLACK/WHITE)

What do you see in this sheet?

		Number		
(a.)	Fire	____	____	1. 2.
(b.)	Ridges	____	____	1. 2.
(c.)	Fertilizer	____	____	1. 2.
(d.)	Water	____	____	1. 2.
(e.)	Irrigated farm (Dry season farming)	____	____	1. 2.

f. Weeds ____ ____ ____ 1. 2.

27. POSTER 1.2. (NACB LOAN)

i. What do you see in this poster?

	1. Yes	2. No	
	____	____	(Getting Bank Loan for Agriculture)
	____	____	(Co-operatives benefits)

	3. Agree	2. Not sure	1. Disagree	
ii. Farmer carrying a. sack of money	____	____	____	PC
b. One farmer has received loans from the bank	____	____	____	I
c. The poster tells you to join Agricultural Co-operative societies	____	____	____	L

28. LEAFLET 1.4. (IMPROVE YOUR GRAIN STORAGE-RUMBU)

i. What is the message of this leaflet?

1. Yes	2. No	
____	____	(Storage in Rumbu)
____	____	(Storing with chemicals)

(ii.) The leaflet shows:- Agree Not sure Disagree

(a.) In picture 1, a man is sweeping rubbish away from this house ____ ____ ____I,1,2,3

(b.) One storage chemical for storage is Gammalin 'A' ____ ____ ____FC,3,2,1

(c.) Caption 2 tells you to clean the store room properly ____ ____ ____C,3,2,1

29. <u>LEAFLET 5.2</u>. (RABBIT KEEPING)

1 2

Yes No

i. What is the message of this leaflet? ____ ____(About raising rabbits)

(ii.)(a.) Drawing No. 1, informs you to keep one rabbit in one cage Agree Not sure Disagree

____ ____ ____L,3,2,1

(b.) The leaflet tells us the processes of feeding rabbits ____ ____ ____L,3,2,1

30. <u>LEAFLET 1.5</u>. (GUINEA-CORN PRODUCTION).

(i.) What is the message of this leaflet?

1. 2.

Yes No

____ ____(Growing G/corn)

(ii.) a. This leaflet tells how to grow yams Agree Not sure Disagree

____ ____ ___ L,1,2,3

b. The caption No 5 tells you to remove some of the G/corn stalks, on each stand ____ ____ ____C,3,2,1

c. Picture 6, tells us how to apply Fertilizer, three weeks after the seeds have germinated ____ ____ ____L,3,2,1

31. LEAFLETS: 2.2(a)

What is the message of this leaflet?

	1. Yes	2. No	
	____	____	____(How to form Cooperatives)
	____	____	____(Benefits)

ii. The leaflet shows the benefits of joing Co-operatives

Agree	Not sure	Disagree
____	____	____

32. LEAFLET 1.6(CITRUS PRODUCTION)

	1.	2.	
i. What is the message of this leaflet?	Yes	No	
	____	____	(How to grow citrus fruits)

ii. The leaflet shows: Agree Not sure Disagree

(a.)	How to prepare the site for planting citrus	___	___	___FC,3,2,1.
(b.)	Picture 6, tells how to apply Fertilizer to the citrus plant	___	___	___I,1,2,3
(c.)	Caption 4, tells you to trim away some branches	___	___	___C,3,2,1

33. Choose the poster that you like best of all among the following:-

(TICK ONLY THE ONE CHOSEN)

a. Poster 1.2 - Dress seeds with Aldrex 'T' ___ 1
b. " 2.1 - Control poultry Diseases ___ 2
c. " 3.1 - Select best millet heads ___ 3
d. " 4.2 - Balanced diet ___ 4
e. " 1.3 - Raise Rabbits ___ 5
f. " 5.2 - Hybrid Maize ___ 6
g. " 4.1 - G/corn Farm ___ 7
h. " 1.2 - N.A.C.B. Loan ___ 8

34. Why did you choose that one?

(TICK AS APPROPRIATE)

		1. Yes	2. No
a.	The Poster is very attractive?	___	___
b.	Everything drawn is very clear?	___	___

		Yes	No
c.	The drawings look natural and real?	____	____
d.	The poster is colourful?	____	____
e.	It is very easy to understand?	____	____
f.	The content of the poster is very useful	____	____

35. From the posters, again choose one whose drawing most resembles real-life people, things, figures and objects:

		(TICK THE ONE CHOSEN)	
a.	Poster 1.2.	____	1
b.	" 2.1	____	2
c.	" 3.1	____	3
d.	" 4.2	____	4
e.	" 1.3	____	5
f.	" 5.2	____	6
g.	" 4.1	____	7
h.	" 1.2	____	8

36. From the Leaflets shown choose the one whose drawings most resembles real people, things, figures and objects.

				(TICK ONE)	
a.	Leaflet 1.4.	-	Improve Grain Storage	____	1.
b.	Leaflet 5.2.	-	Rabbit Keeping	____	2.
c.	Leaflet 2.2.	-	Forming Agric. Co-op.	____	3.
d.	Leaflet 1.6.	-	Citrus production	____	4.
e.	Leaflet 1.5.	-	G/corn production	____	5.
f.	Leaflet 2.3.	-	Groundnut Diseases	____	6.

37. Which of the following leaflets do you like best?
(TICK ONE)

a. Leaflet 1.4. _____ 1

b. " 5.2. _____ 2

c. " 2.2. _____ 3

d. " 1.6. _____ 4

e. " 1.5. _____ 5

f. " 2.3. _____ 6

38. Comment generally on the Posters and Leaflets

Posters .....

.....

.....

. .....

Leaflets . .....

. . . . .

.....

.....

APPENDIX B

AGRIC. INFORMATION PERSONNELS' QUESTIONNAIRE
ON AERLS POSTERS FLIPCHARTS
& LEAFLETS

To be completed by participants at the Agricultural Information Workshop.

Instructions: - Please fill in the blanks, and tick/ write Yes or No in the appropriate spaces below:

I. (a) Name _____

b. Profession _____

c. Employer _____

d. Did you ever use A.E.R.L.S. Flipcharts, posters, and Farmers Leaflets for extension work (for any other purpose) in your station?

Yes_____

No _____

II II. a. Write in the spaces provided below the quantity of posters, and leaflets, on each of the topics listed, that you have used before:-

Topic	Posters	Leaflets
Fertilizer application	_____	_____
Use of Insecticides	_____	_____
Maize Production	_____	_____
Guinea Corn Production	_____	_____
G/Nut Production	_____	_____
Yams	_____	_____
Others(indicate topic and type)	_____	_____

b. In what situation did you use A.E.R.L.S. Posters and Leaflets.

1. _____

2. _____

3. _____

4. _____

III. Look at the three posters shown, then write Yes or No in the blank spaces to indicate the faults in the artwork of the posters listed.

		Guinea Corn	Grain Storage	Cotton
1.	The drawing of objects and figures are bad			
2.	The Poster is not attractive			
3.	Farmers will not understand the message			
4.	Do you understand the poster?			

IV. Tick, for each item listed, the comment or criticism you consider appropriate regarding A.E.R.L.S. Posters, and Leaflets:

Items	Excellent	Good	Fair	Needs Improvement	Needs to be redrawn (changed)
1. Colour Use					
2. Drawings					
3. Appropriateness of depictions (dress, implement, objects)					
4. Message of the Poster					
5. Others (specify)					

V. Suggest three topics which A.E.R.L.S. should develope into new posters and Leaflets. Choose topics which in your own opinion will be of great use for informing farmers in your area of work.

VI. Comment generally on the visuals

APPENDIX C.

COMMUNICATION SPECIALISTS

ASSESSMENT SHEET

INTRODUCTION:

The purpose of this questionnaire is to determine the aesthetic level of selected agricultural extension visuals. This exercise is being done as part of research project for M.A. Graphics (Industrial Design).

Hoping you will give sincere responses to each of the items.

Yours sincerely,

R.A.A. Shittu

INSTRUCTIONS:

(1) Please look at each leaflet or Poster critically.

Then enter a score (3,2, 1 or 0) in the corresponding space, which best measures it for the particular item listed. The scores scheme is as follows:

good = 3, fair = 2, poor = 1, and very poor = 0

Name _____

Profession_____

ITEMS	LEAFLETS				POSTERS			
	1.4	1.5	2.2	2.3	1.3	2.1	3.1	5.1
CONTRASTS								
SIMPLICITY								
THE MESSAGE CONCEPTION								
CLARITY OF CONTENT								
ATTRACTION								
DRAUGHTS-MANSHIP								
OTHERS								

COMMENT GENERALLY ON THE VISUALS: _____

DEPARTMENT OF INDUSTRIAL DESIGN
HEAD OF DEPARTMENT: Y. D. HASSAN
Teleph: 32581/3 Direct : 33231 Telegs: Ualbello Zaria.

Your Ref:

Our Ref: F. ID/83/85

22nd July, 1985

TO: Mallam/Alhaji _____

_____

_____

Dear Sir/Madam,

Administering Of Questionnaires And Interviews On Agricultural Extension Posters And Leaflets In ZARIA L.G.A. By SHITTU, R. A. A.

I certify that Shittu, R.A.A. is a Post graduate student (Graphics) in this Department. He is carrying out a research involving survey Questionnaires and interviews with farmers in Samaru, Panladan, Bomo, Biye and Hunkuyi.

The purpose of the research is to determine the extent of understanding and use of Agricultural Extension Posters and Leaflets. This will contribute to effective communication with farmers, and thus facilitate increased food production in Nigeria.

Please give him maximum cooperation in answering and completing the questionnaires.

Your responses will be treated confidentially.

Thanks.

Yours faithfully,

Y. D. Hassan
HEAD OF DEPARTMENT.

DEPARTMENT OF INDUSTRIAL DESIGN
23 JUL 1985
A. B. U. ZARIA

AGRICULTURAL EXTENSION AND RESEARCH LIAISON SERVICE
AHMADU BELLO UNIVERSITY,
ZARIA.

16th June, 1986.

Dear Respondent,

THE EXTENT OF RECEPTION, COMPREHENSION AND USE OF AGRIC. EXTENSION POSTERS AND LEAFLETS, AMONG ILLITRATE AND LITERATE PRACTISING FARMERS IN ZARIA L.G.A.

QUESTIONNAIRE FOR FARMERS

INTRODUCTION:

The A.E.R.L.S. regularly produces Extension Posters Leaflets, Flipcharts and other publications for conveying Agricultural Informations to Farmers. In order to know the State of (Public) farmer's understanding, and use of these publications, the questionnaire was prepared for you and others to answer.

The research is conducted as part of work for Master of Arts Degree in Industrial Design at Ahmadu Bello University, Zaria. The researcher is Shittu R.A.A. a Graphic Art staff in the Agric. Audio-Visual Department, Agric, Extension and Research Liaison Services, Ahmadu Bello University, Zaria.

Your answers will enable the A.E.R.L.S. to produce better Extension Graphic Visuals that will be easily understood by the users. This will help the nation to improve her agricultural productivity.

Therefore we request for your full cooperation.

Yours sincerely,

J. B. IGUNNU
HEAD OF A.A.V.DEPT.

Department of Agriculture & Natural Resources

ZARIA LOCAL GOVERNMENT

Our Ref: ZLG/AGR-TRS/105/VOL.1/49

Date 20th June, 1986.

Your Ref:.....

Dukan Hakimai,

Dukan Dagattai,

Dukan Ma'aikatan Gona,

Dukan Shugabannin Hadaddayar Majalisae Manoma,

Yankin Karamar Hukumar Zaria.

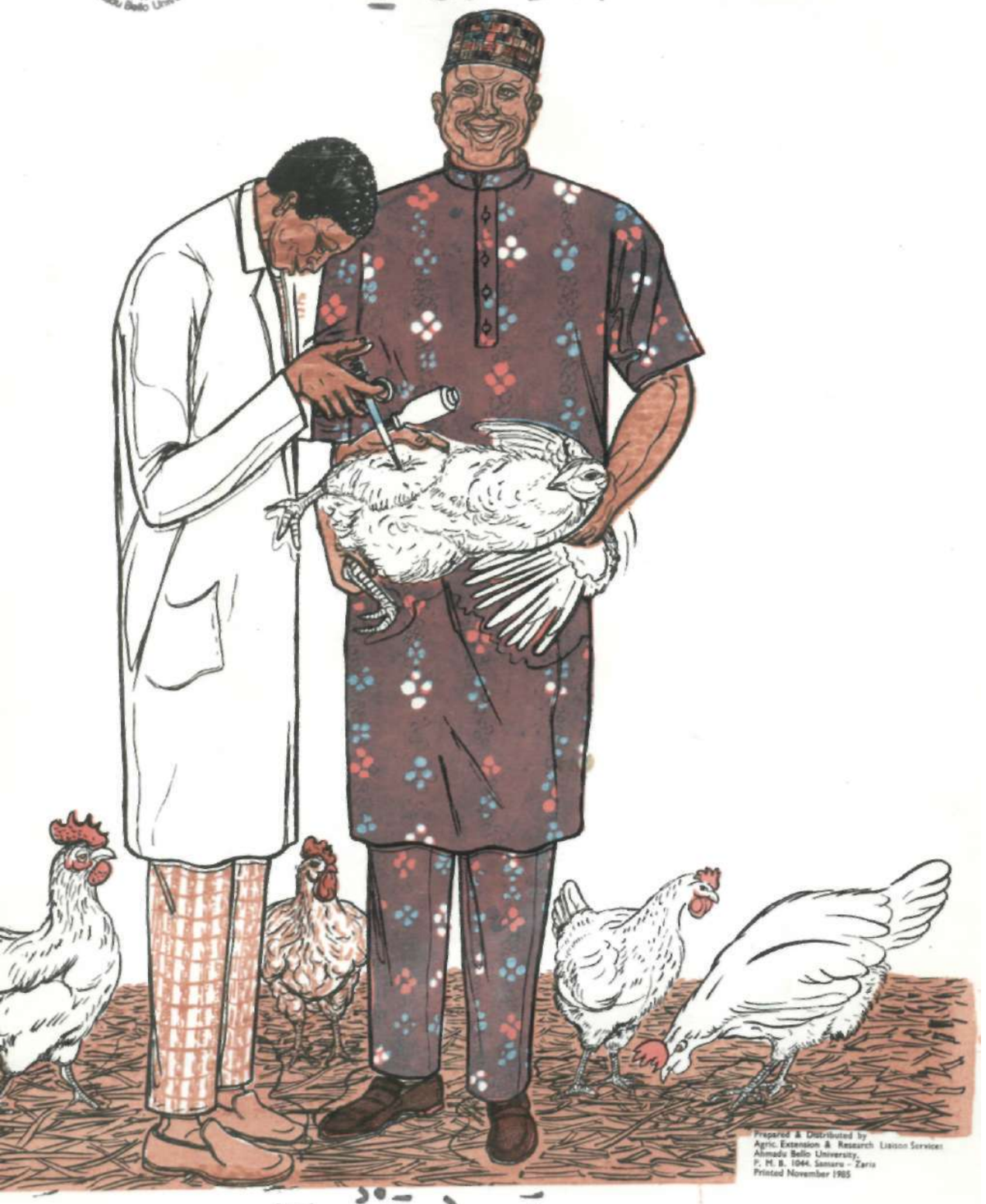
TAKARDAR GABATARWA.

Bayan gaisuwa mai yawa. An ummurceni da in gabatar da Mr. Shittu, R.A.A., wanda ke karasa karatunsa na Digiri na Biyu a Jami'ar Ahmadu Bello ta Zaria, don ka bashi duk taimakon da zaka iya don ya fashinci yadda aka tafiyarda ayyukan Gona a yankinku.

Allah ya bada sa'a, dai anjima.

(ALH: MOHAMMADU MUSIAFA MOH'D)
SHUGABAN MA'AIKATAR GONA DA ALBARKAR KASA, KARAMAR HUKUMAR ZARIA.

حنایطو رشیون کجی



Prepared & Distributed by
Agric. Extension & Research Liaison Services
Ahmadu Bello University,
P. M. B. 1044, Samaru - Zaria
Printed November 1985

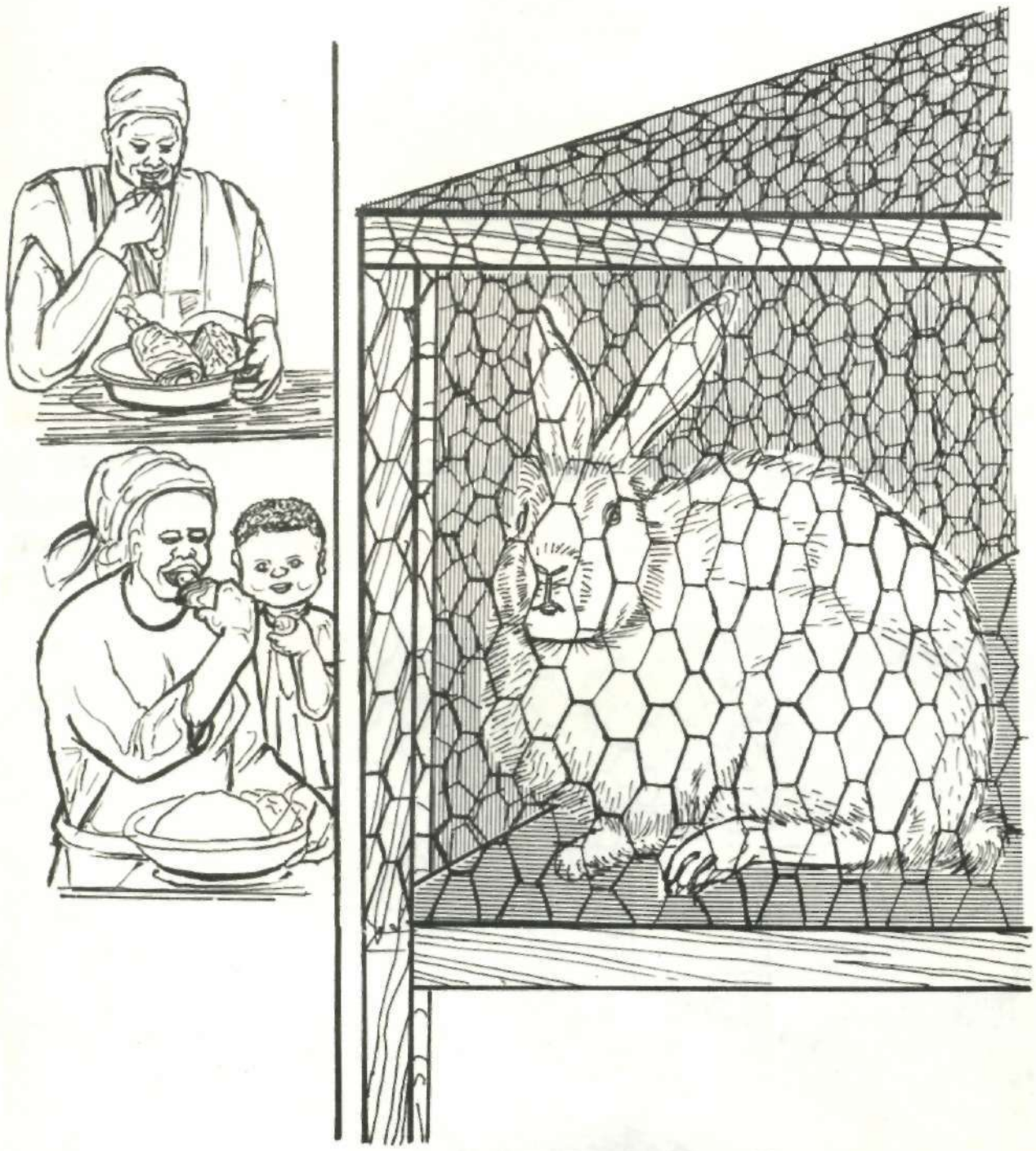
تیمشم آلدورا

Reduced Extension Poster No. 53

AJAMI

d by Hamdan Express Printers, Zaria

Raise Rabbit



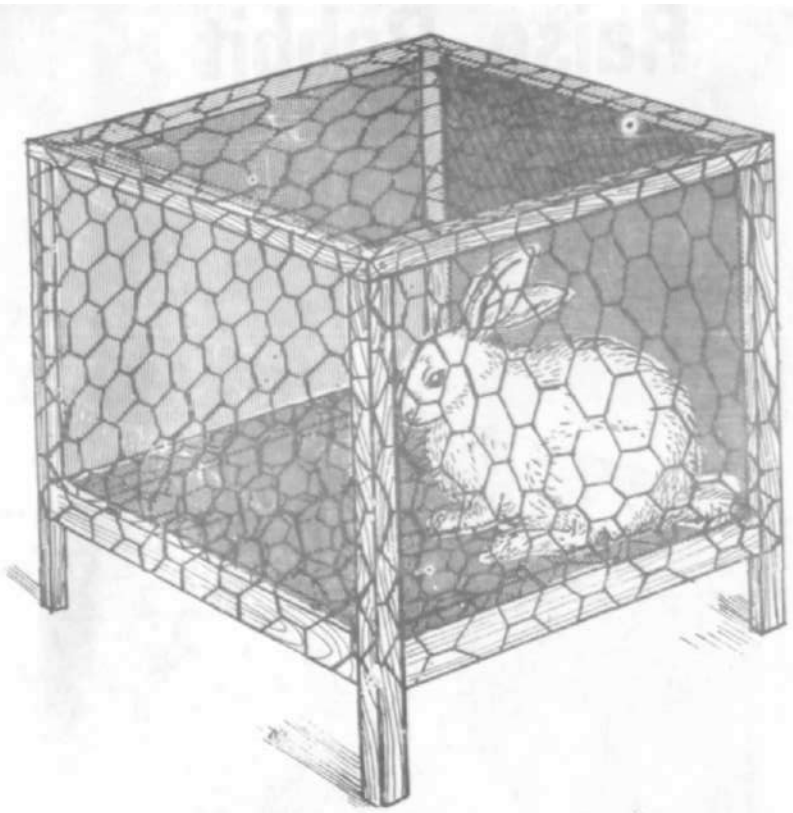
For More Meat

Produced and distributed by:

Agric, Extension and Research Liaison Services
Ahmadu Bello University
P. M. B. 1044 Zaria—Nigeria
Published: June, 1985

ENGLISH

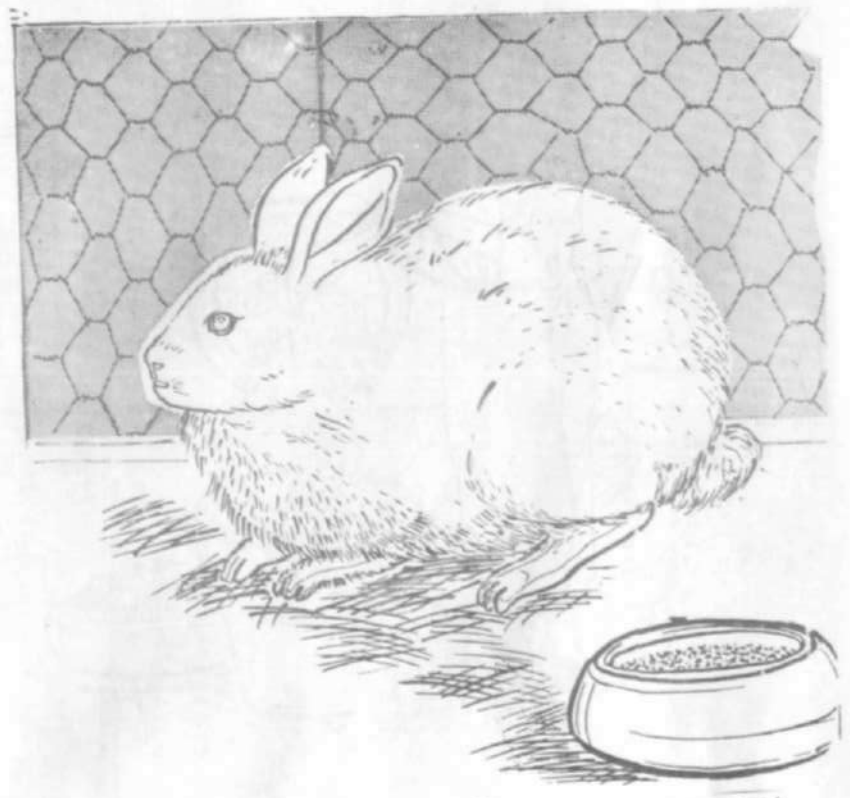
EXTENSION LEAFLET No. 33



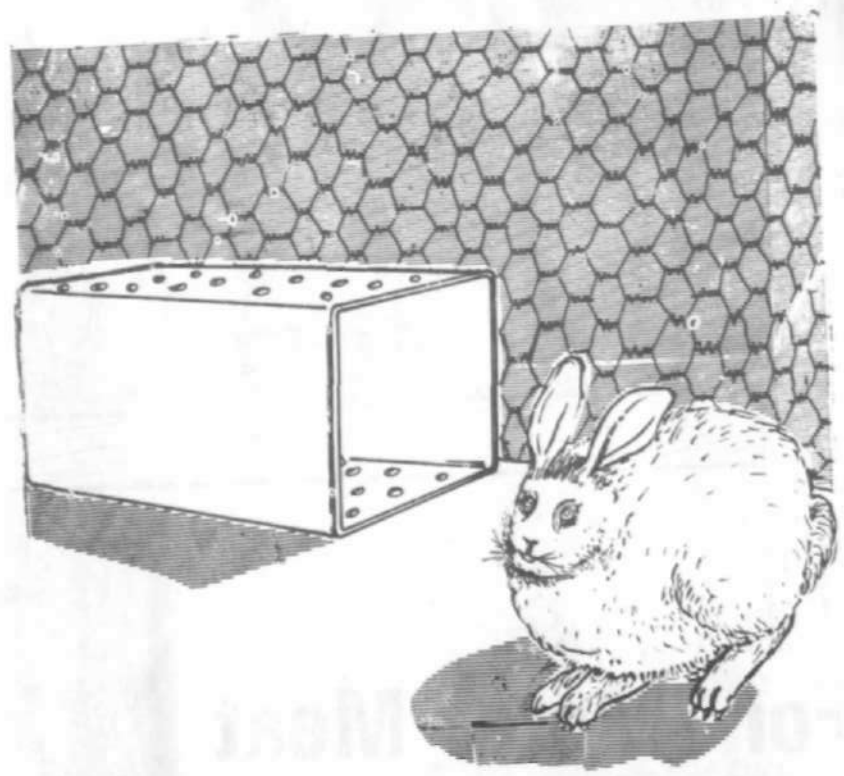
1. Keep adult rabbits singly in cages



2. Take female rabbit to male rabbit for mating preferrably in the mornings or evenings.



3. Take good care of your pregnant rabbit



4. Provide pregnant doe with a nest box three weeks after mating



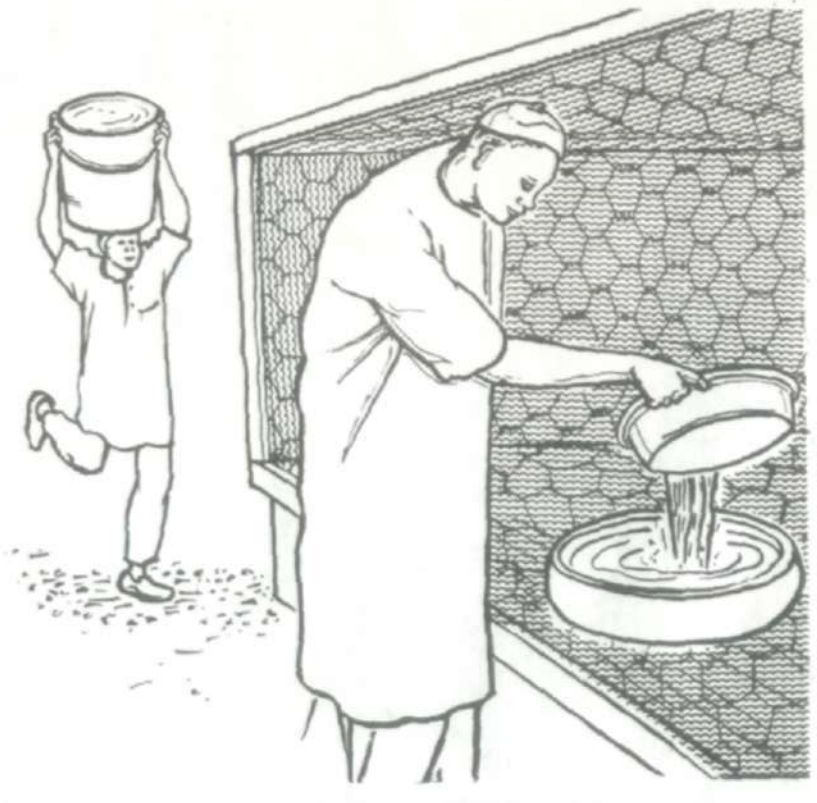
5. Give good management to get 4 litters per year with 6-8 young ones per litter



6. Feed your rabbit with greens and grains



7. You can feed rabbit with vegetable wastes and food left overs



8. Provide your rabbit with clean water always

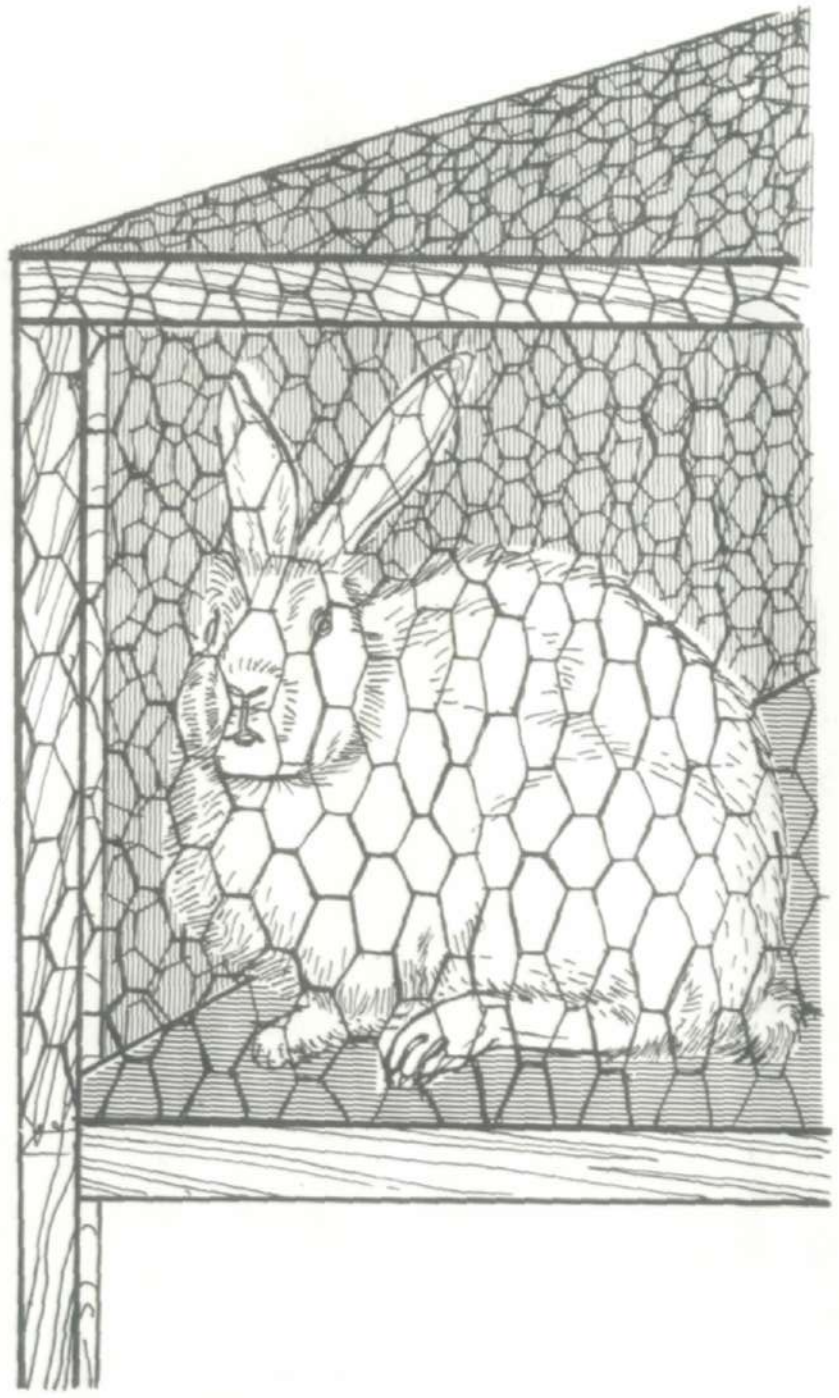
PRINTED BY DADA PRESS ZARIA

Raise Rabbit

AERLS
Ahmadu Bello University







For More Meat

Produced and distributed by:

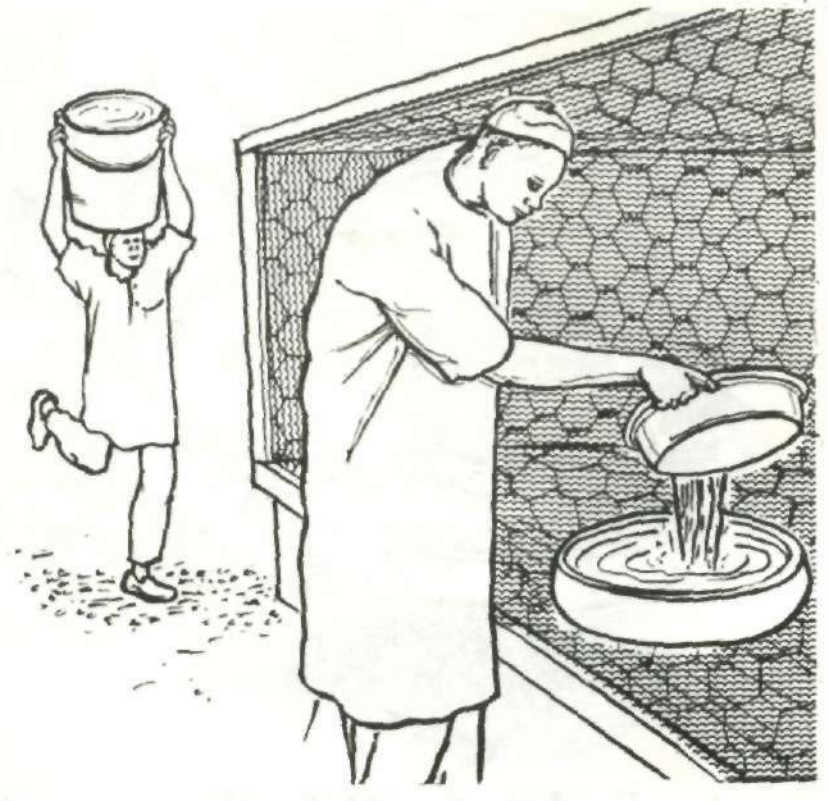
Agric. Extension and Research Liaison Services
Ahmadu Bello University
P. M. B. 1044 Zaria—Nigeria
Published: June, 1985

ENGLISH

EXTENSION LEAFLET No. 33



7. You can feed rabbit with vegetable wastes and food left overs

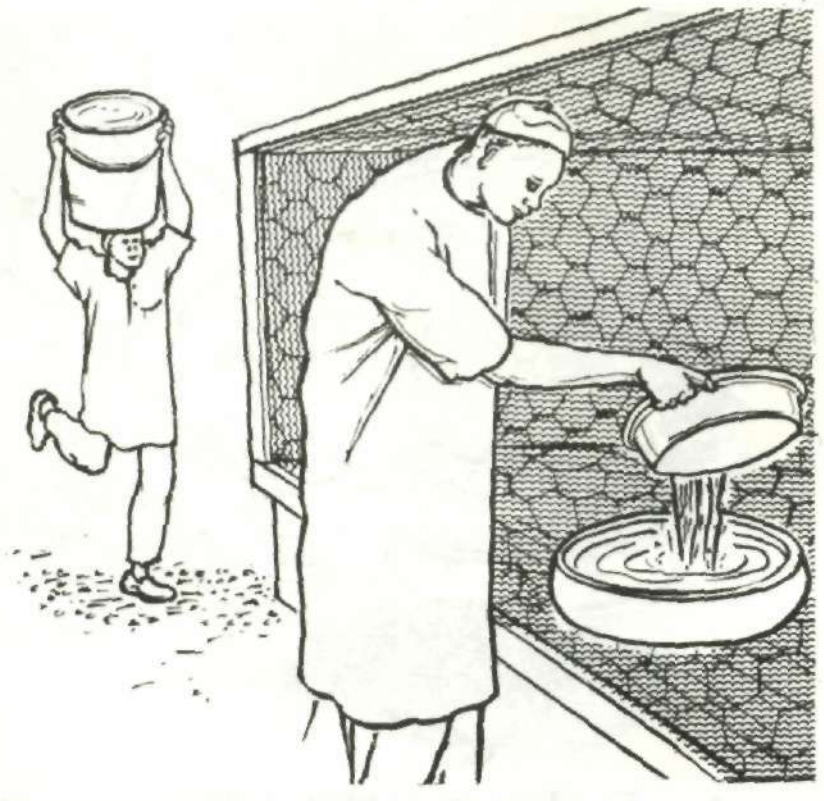


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA



7. You can feed rabbit with vegetable wastes and food left overs

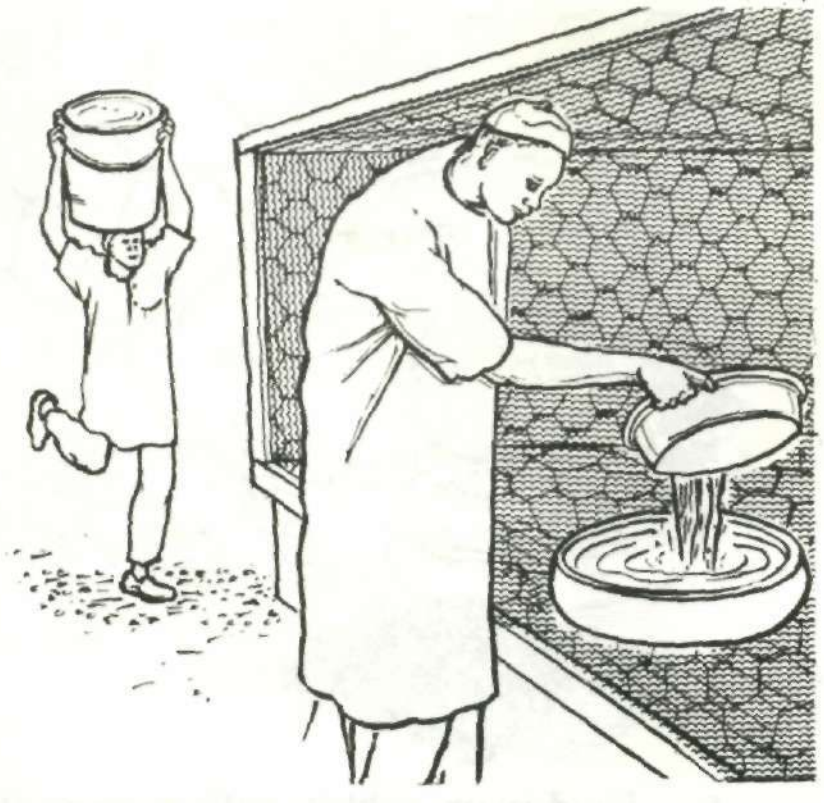


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA



7. You can feed rabbit with vegetable wastes and food left overs

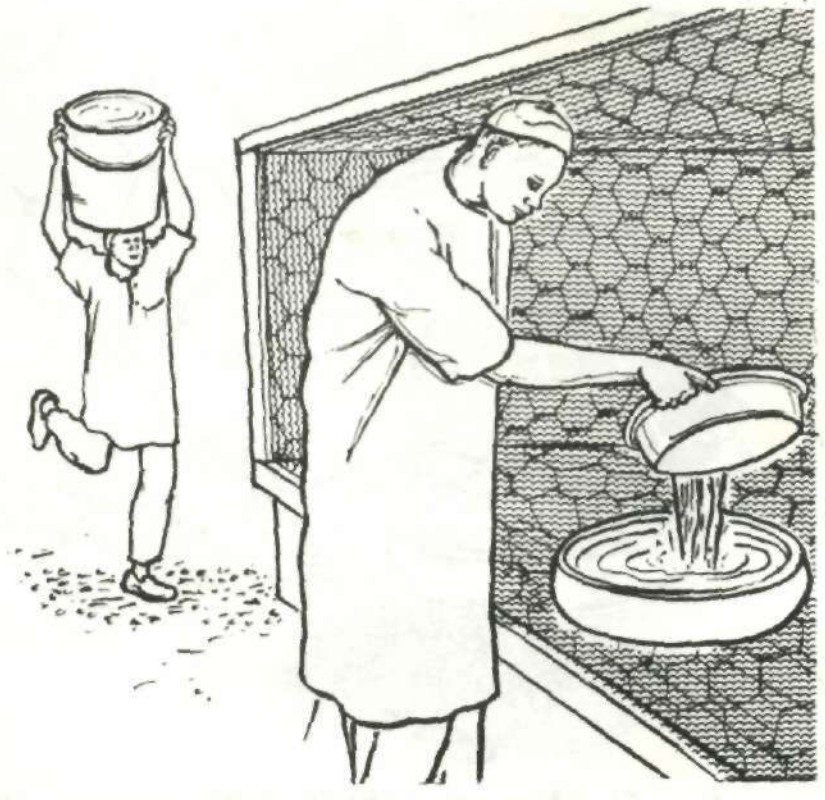


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA

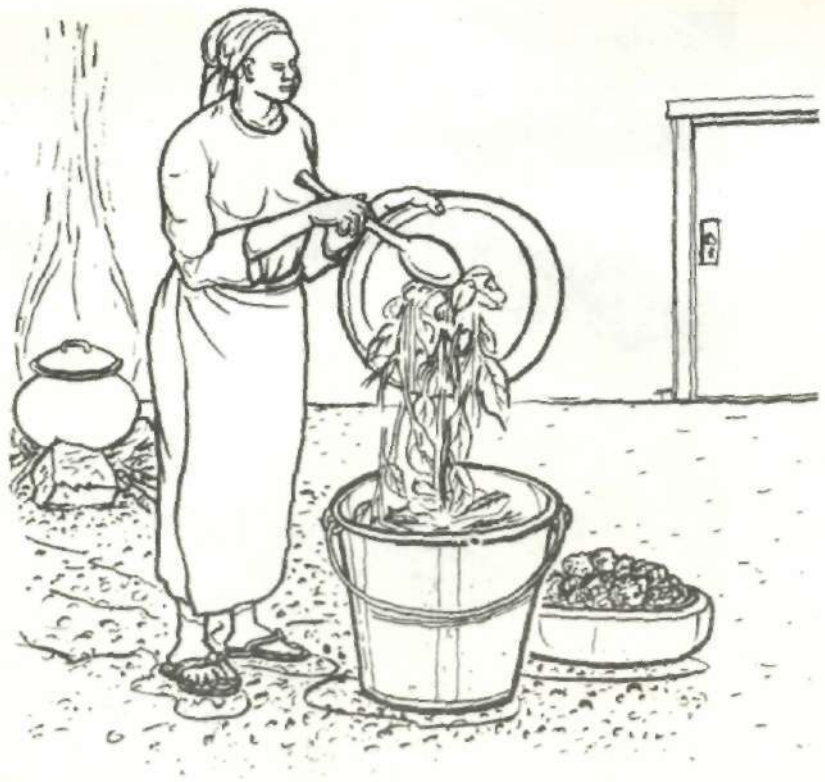


7. You can feed rabbit with vegetable wastes and food left overs

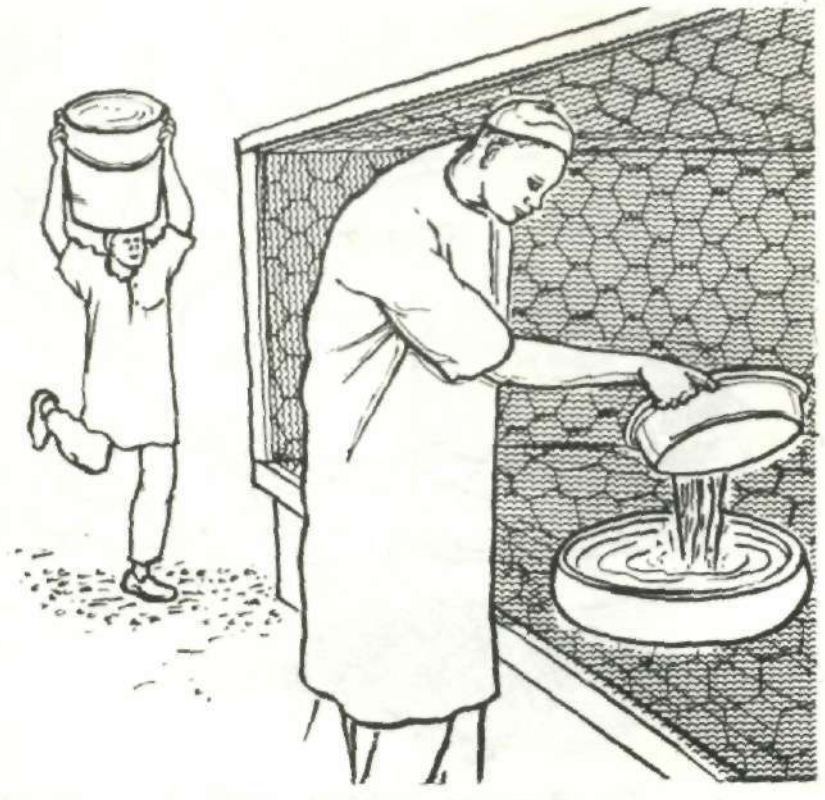


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA



7. You can feed rabbit with vegetable wastes and food left overs

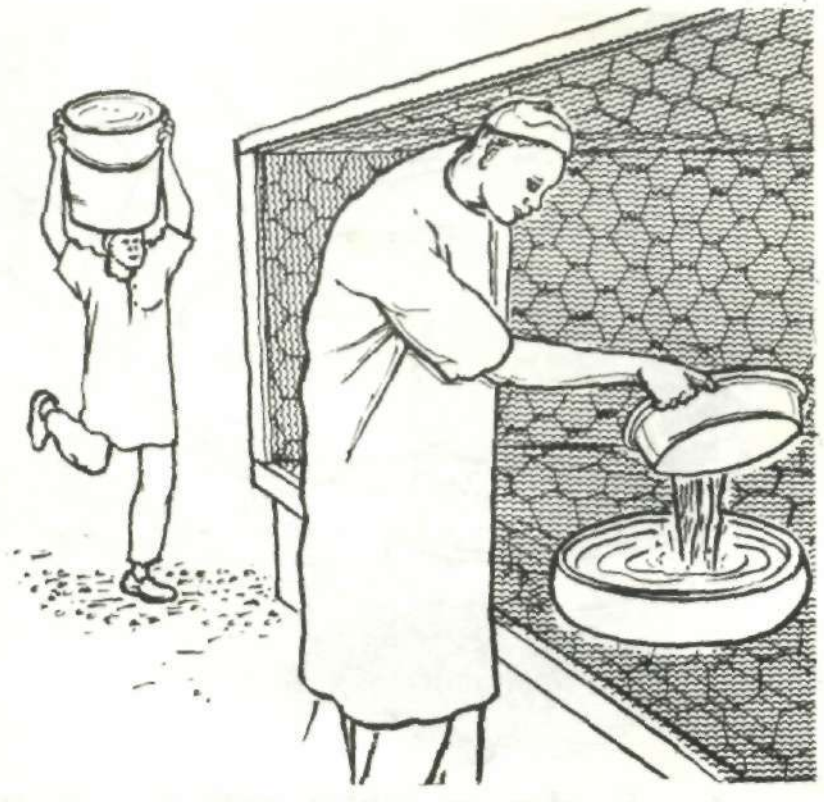


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA



7. You can feed rabbit with vegetable wastes and food left overs

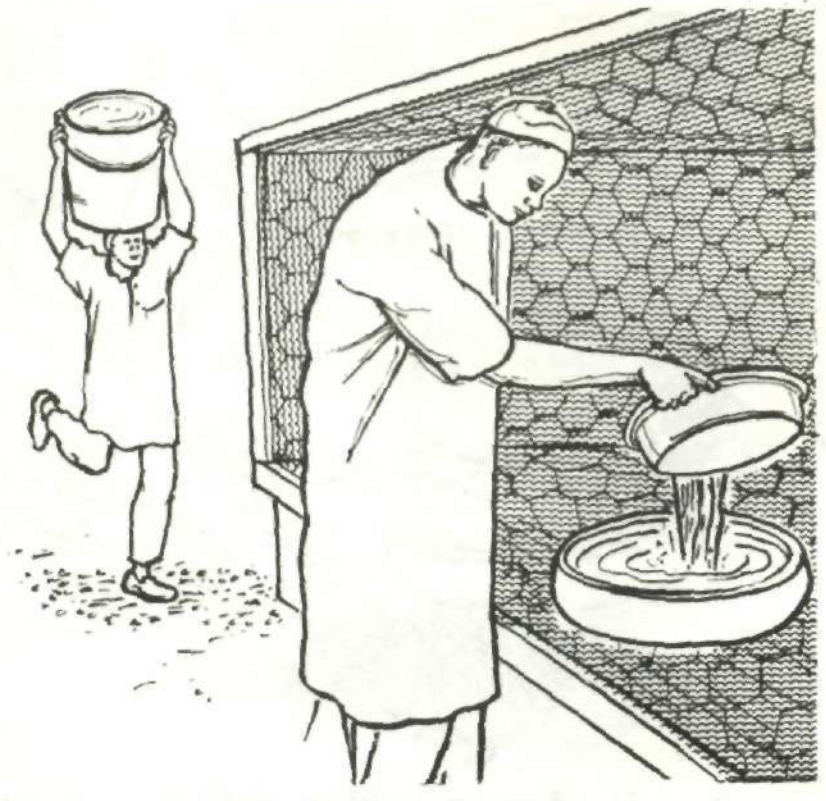


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA



7. You can feed rabbit with vegetable wastes and food left overs

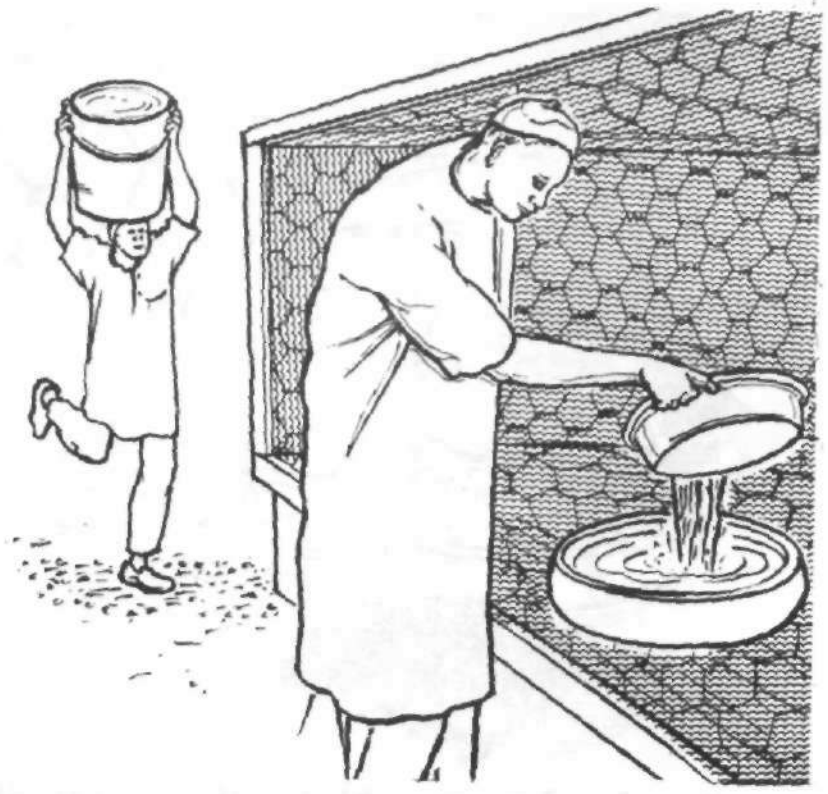


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA



7. You can feed rabbit with vegetable wastes and food left overs

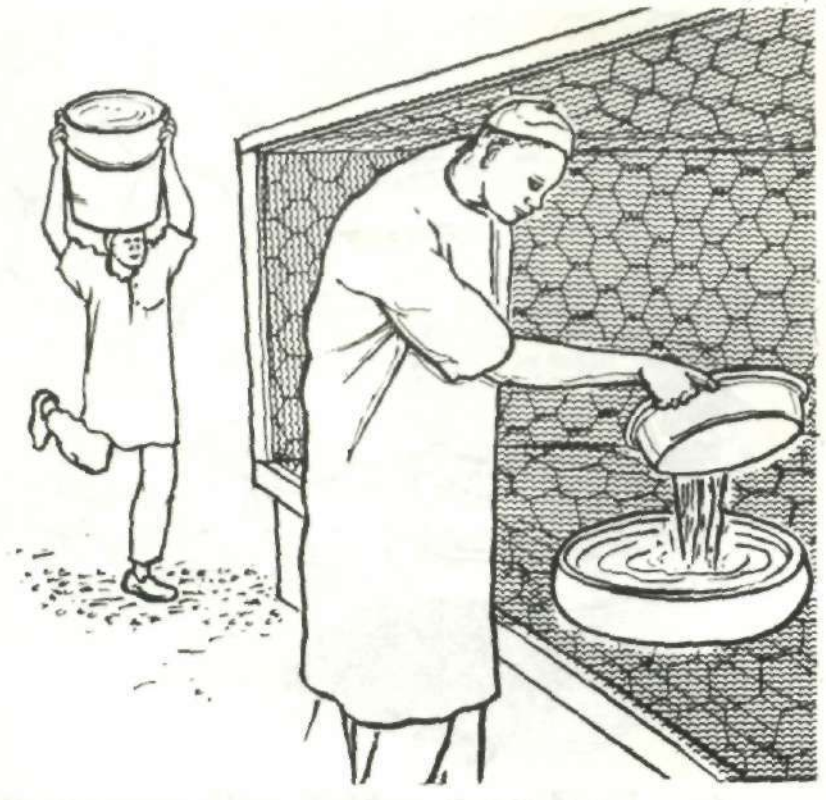


8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA



7. You can feed rabbit with vegetable wastes and food left overs



8. Provide your rabbit with clean water always

PRINTED BY DADA PRESS ZARIA

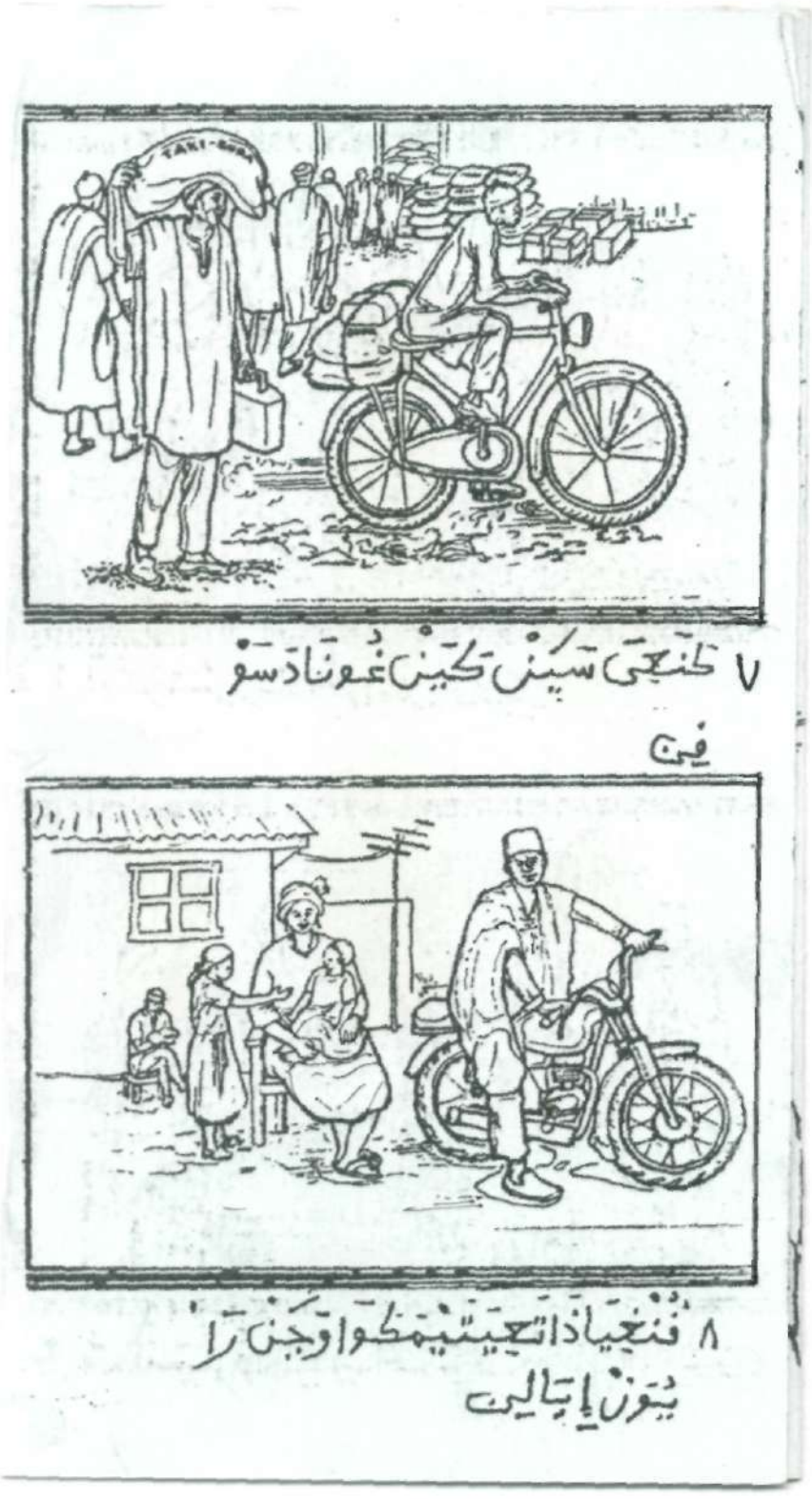
AERLS Extension Leaflet, No. 33.

"Control poultry diseases" poster reduced to A4 size and distributed as handbills.

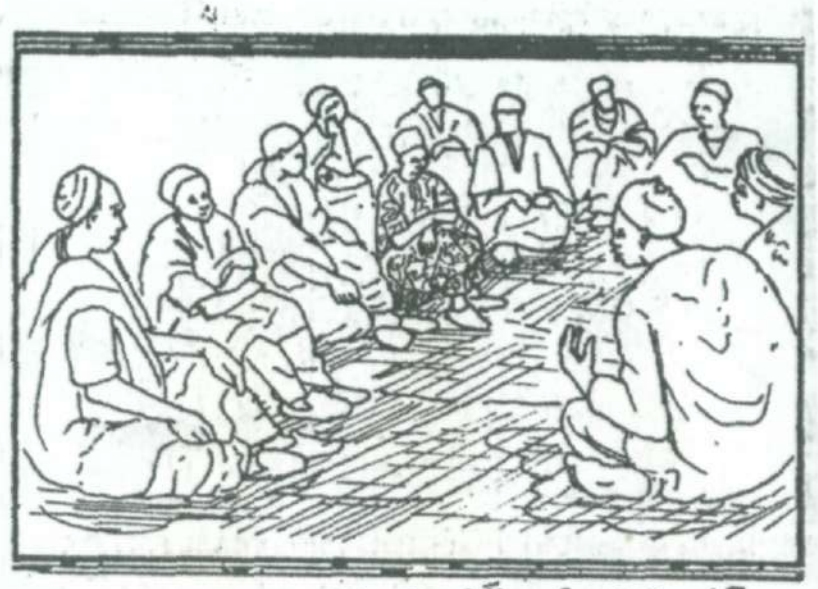
APPENDIX G

Alternative format (2.2L) suggested for literates.

(see implications: page 155).



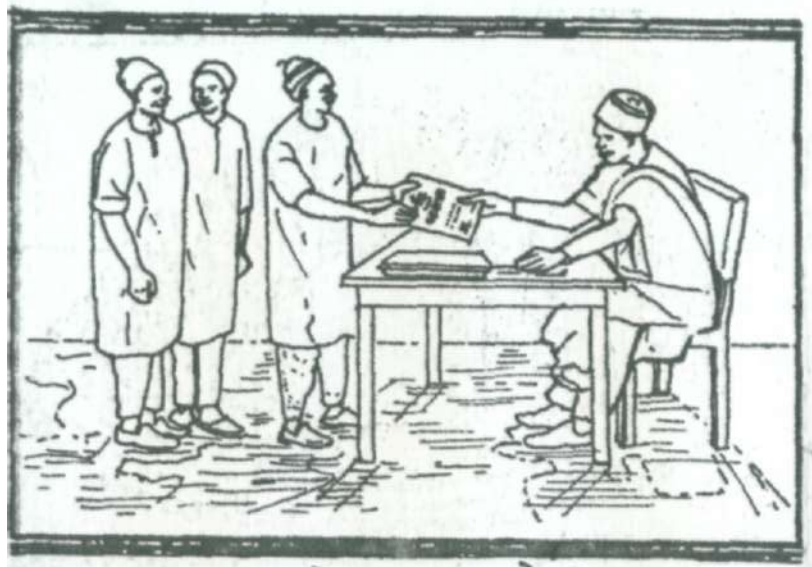
Leaflet 2.2L: Ajami version. The format is a reverse of the English version, because the script is read from right to left.



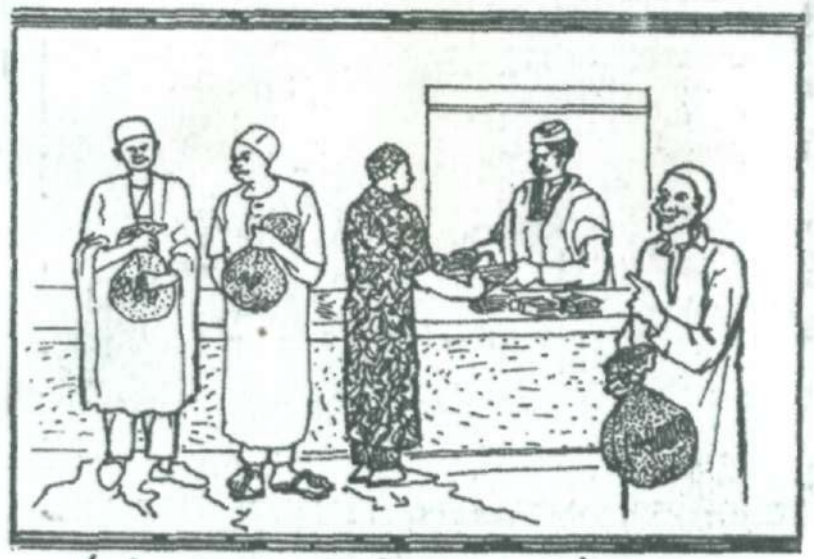
١ آجزا شروند لحن بين فنغيا



٢ تسمو كمتين يشر پيشر پيك



٣ گير رجستر فنغيز اورز
جا يحن غمر كن نفنغيوي آجمز ك.



٤ تحنتير فنغيا كنجي سا من رنبك



٥ كنجي خطكن دن عمينطن
غونا.



٦ كنجي سيد عمبنين غونا
آخبكن

Leaflet 2.2L: Ajami version. The format is a reverse of the English version, because the script is read from right to left.



Produced and distributed by :
Agricultural Extension & Research Liaison Services
Ahmadu Bello University,
P.M.B. 1044, Samaru — Zaria, Nigeria



