

EXTENSION EDUCATION IMPACTS OF FARMING
SYSTEMS RESEARCH IN LESOTHO

BY

DAVID VANCE YOUNG B.S.Ag., B.F.T., M.Ed., Ed.S.

SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF EDUCATION IN THE FACULTY OF EDUCATION: DEPARTMENT
OF THE HISTORY OF EDUCATION AND COMPARATIVE EDUCATION AT THE
UNIVERSITY OF THE ORANGE FREE STATE, BLOEMFONTEIN

PROMOTOR: PROF DR D VERMAAK

CO-PROMOTOR: PROF DR C S BLIGNAUT

JANUARY 1986

DECLARATION

Since the independent academic research embodied in this study is related to field activities performed under contract with the Farming Systems Research Project in Lesotho, it is appropriate to clarify that any views, conclusions or recommendations stated herein are those of the researcher and not necessarily those of Washington State University, the U S Agency for International Development, or the Government of Lesotho.

The term farming systems research and its common acronym FSR, which appear so frequently in the study, refer to the farmer-centered agricultural development strategy and integrated research approach adopted by the Research Division of the Lesotho Ministry of Agriculture and Marketing, and not to the Farming Systems Research Project as a separate entity, except where the latter is specifically named.

DEDICATION

This study is dedicated to my wife, Julia Correa Youmans, whose perceptions of high achievement have been a consistent source of motivation in my university career.

DAVID YOUMANS

ACKNOWLEDGEMENTS

Grateful acknowledgements are due to various persons who directly or indirectly contributed to the completion of this study:

- Prof D Vermaak, head of the Research Institute for Education Planning at the University of the Orange Free State, for invaluable guidance and superior supervision during the course of this study.
- Prof C S Blignaut, head of the Department of Agricultural Economics at UOFS, for consistently bringing an agricultural focus to a research effort in extension education.
- Mr Winston Ntsekhe, Director of Technical and Special Services of the Lesotho Ministry of Agriculture and Marketing, for his unswerving support of this research endeavour.
- Mr Musi Matli, Chief of the Research Division of the same ministry, for his constant encouragement.
- Drs D J Lee and J C Ballard, team leaders of the Farming Systems Research Project in Lesotho, and various other team members for their generous advice and professional counsel.
- Mr A S Sefeane and other research extension colleagues who helped organize and deliver the extension education programmes upon which this research was conducted.

- Prof J van der Merwe, head of the Department of the History of Education and Comparative Education, for his timely and meaningful suggestions.
- Dr John Gay, freelance consultant, Mrs Cecilia Ramakhula, research extension assistant, and Mr Carel Kriel, research assistant, for their critical help with questionnaire design, data collection, and computer-assisted data-processing.
- Mrs J M Scholtz, secretary for RIEP, for her massive after-hours commitment to the typing of the research manuscript.
- The many Basotho farmers, chiefs, and agricultural professionals who so willingly shared their personal perceptions.
- My wife, Julia, for her encouragement and support.

D V YOUMANS
MASERU

January 1986

TABLE OF CONTENTS

	Page
CHAPTER 1 INTRODUCTION	1
1.1 ORIENTATION	1
1.2 THE FIELD OF THIS STUDY	5
1.3 THE PURPOSE OF THE STUDY	7
1.4 METHODS OF INVESTIGATION	9
1.4.1 The literature review	10
1.4.2 The evaluative/investigative model	11
1.4.3 Questionnaires	18
1.4.4 Interviews	20
1.4.5 Verification of data	21
1.4.6 Analysis of data	22
1.5 EXPLANATION OF TERMS	23
1.6 ABBREVIATIONS	27
CHAPTER 2 NONFORMAL EDUCATION AND THE NEEDS OF THE RURAL POOR	29
2.1 BACKGROUND	29
2.2 NONFORMAL EDUCATION	34
2.3 SUMMARY	49
CHAPTER 3 NONFORMAL (EXTENSION) EDUCATION IN AGRICULTURAL DEVELOPMENT	51
3.1 EXTENSION	51
3.1.1 History and development	51
3.2 EXTENSION IN AGRICULTURAL DEVELOPMENT	73
3.3 SUMMARY	105

CHAPTER 4	FARMING SYSTEMS RESEARCH AND EXTENSION EDUCATION: OVERVIEW AND THE LESOTHO EXPERIENCE	108
4.1	FARMING SYSTEMS RESEARCH	108
4.2	EXTENSION EDUCATION IN FARMING SYSTEMS RESEARCH	125
4.3	EXTENSION EDUCATIONAL PROGRAMMES IN FARMING RESEARCH IN LESOTHO	143
4.3.1	Extension education	150
4.3.2	Extension for improvement of farming systems	150
4.3.3	Programme development education	151
4.3.4	Professional improvement in agricultural extension	151
4.3.5	FSR training for REA's and PCV's	152
4.3.6	Direction of extension seminar	152
4.3.7	Farmer motivation seminar	152
4.3.8	REA/FMA training on coordination of work	153
4.3.9	Plant and soil subject matter specialists short course	153
4.3.10	Peace Corps orientation	154
4.3.11	Extension schools	154
4.3.12	Involvement of farmers in FSR	155
4.3.13	Field communication	159
4.3.14	Evaluative feedback	160
4.3.15	Dissemination of research findings to farmers	161
4.3.16	Coordination of research information delivery	162
4.3.17	In-service training	163
4.3.18	Reports and publications for MOA and others	164
4.3.19	Collaboration with research extension network	165

4.4	SUMMARY	169
CHAPTER 5	THE IMPACTS OF FSR EXTENSION PROGRAMMES ON MEMBERS OF FARMER CONTACT GROUPS IN LESOTHO	172
5.1	FARMER CONTACT GROUPS	172
5.2	EXTENSION EDUCATION PROGRAMMES	177
5.3	THE RESEARCH PROBLEM	196
5.4	METHODOLOGY	197
5.5	DATA COLLECTION	200
5.6	DATA PRESENTATION AND ANALYSIS	204
5.6.1	Biographical data	205
5.6.2	Farm characteristics	210
5.6.3	Extension education indicators	214
5.6.4	KASA and practice change results	220
5.6.5	End results	242
5.6.6	Farmer contact groups as an innovations diffusion network	251
5.7	SUMMARY	260
CHAPTER 6	THE EFFECTS OF FSR EXTENSION EDUCATION PROGRAMMES AMONG CHIEFS, HEADMEN AND HEADWOMEN IN THREE LESOTHO PROTOTYPE AREAS	262
6.1	CHIEFS, HEADMEN AND HEADWOMEN	262
6.2	EXTENSION EDUCATION PROGRAMMES	263
6.3	THE RESEARCH PROBLEM	265
6.4	METHODOLOGY	265
6.5	DATA COLLECTION	267
6.6	PRESENTATION AND ANALYSIS OF DATA	269

6.6.1	Biographical data	269
6.6.2	People involvement and validation of course content	271
6.6.3	Reactions	271
6.6.4	KASA and practice change	272
6.6.5	End results	286
6.6.6	Recommendations	287
6.7	SUMMARY	287
CHAPTER 7	THE IMPACT OF FSR EXTENSION EDUCATION PROGRAMMES ON DISTRICT-BASED EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS	290
7.1	EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS	290
7.2	EXTENSION EDUCATION PROGRAMMES	292
7.2.1	"Extension for improvement of farming systems" course	284
7.2.2	"Professional improvement in agricultural extension" course	300
7.2.3	"Plant and soil science subject matter specialists' training" course	314
7.2.4	"The Extension Challenge": A course in extension methodo- logy for district extension workers and subject matter specialists	321
7.2.5	Continuing programmes	333
7.3	THE RESEARCH PROBLEM	334
7.4	METHODOLOGY	334
7.5	DATA COLLECTION	337
7.6	PRESENTATION AND ANALYSIS OF DATA	339

7.6.1	Biographical data	340
7.6.2	Validation of course(s) content	345
7.6.3	Reaction level(s)	345
7.6.4	Extension education methods	346
7.6.5	KASA and practice change for the Mazenod Course	346
7.6.6	KASA and practice change for the Airport Hotel Course	356
7.6.7	KASA and practice change for Research Division course	365
7.6.8	KASA and practice change for District-Based Course	367
7.6.9	Examples of practice change	380
7.6.10	Recommendations by participants	386
7.7	SUMMARY	387
CHAPTER 8	CONCLUSIONS	390
LIST OF FIGURES		
FIGURE 5.1	AGE DISTRIBUTION OF FEMALE AND MALE RESPONDENTS FROM FSR FARMER CONTACT GROUPS, LESOTHO, 1985	206
FIGURE 5.2	KASA AND PRACTICE CHANGE IN AGRONOMY, LESOTHO, 1985	225
FIGURE 5.3	KASA AND PRACTICE CHANGE IN HORTICULTURE, LESOTHO, 1985	226
FIGURE 5.4	KASA AND PRACTICE CHANGE IN PLANT PROTECTION, LESOTHO, 1985	227
FIGURE 5.5	KASA AND PRACTICE CHANGE IN FARM MACHINERY LESOTHO, 1985	228

FIGURE 5.6	KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT, LESOTHO 1985	229
FIGURE 5.7	END RESULT (REAL BENEFIT) TO MEMBERS OF CONTACT GROUPS OF EXTENSION EDUCATION PROGRAMMES	245
FIGURE 5.8	DIFFUSION EFFECTIVENESS ACCORDING TO AGE AND FARMING EXPERIENCE, LESOTHO 1985 (CHART)	256
FIGURE 5.9	DIFFUSION EFFECTIVENESS ACCORDING TO AGE AND FARMING EXPERIENCE, 1985 (BAR CHART)	257
FIGURE 5.10	DIFFUSION EFFECTIVENESS AND FARMING EXPERIENCE, LESOTHO, 1985 (LINE CHART)	258
FIGURE 5.11	DIFFUSION EFFECTIVENESS AND FARMING EXPERIENCE, LESOTHO, 1985	259
FIGURE 6.1	KNOWLEDGE CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPICS RELATED TO FSR EXTENSION PROGRAMMES, LESOTHO, 1985	279
FIGURE 6.2	ATTITUDE CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPICS RELATED TO FSR EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985	280
FIGURE 6.3	SKILLS CHANGES IN CHIEFS AND HEADMEN/WOMEN IN TOPICS RELATED TO FSR EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985	281
FIGURE 6.4	ASPIRATIONS CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPICS RELATED TO FSR EXTENSION EDUCATION PROGRAMMES; LESOTHO, 1985	282
FIGURE 6.5	PRACTICE CHANGES OF CHIEFS AND HEADMEN/WOMEN IN TOPICS RELATED TO FSR EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985	283
FIGURE 7.1	AGE CHARACTERISTICS OF EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS ATTENDING EXTENSION EDUCATION COURSES, LESOTHO, 1985	342
FIGURE 7.2	YEARS OF SERVICE WITH MINISTRY OF AGRICULTURE OF PARTICIPANTS IN EXTENSION CON-	344

TINUING EDUCATION COURSES, LESOTHO, 1985

FIGURE 7.3	KNOWLEDGE CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985	352
FIGURE 7.4	ATTITUDE CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985	353
FIGURE 7.5	SKILLS CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985	354
FIGURE 7.6	ASPIRATIONS CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985	355
FIGURE 7.7	PRACTICE CHANGE FOR PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO	359
FIGURE 7.8	KNOWLEDGE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985	370
FIGURE 7.9	ATTITUDE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985	371
FIGURE 7.10	SKILLS CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985	372
FIGURE 7.11	ASPIRATIONS CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985	373
FIGURE 7.12	PRACTICE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985	374
FIGURE 7.13	KNOWLEDGE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985	376
FIGURE 7.14	ATTITUDE CHANGE AMONG PARTICIPANTS IN THE	377

DISTRICT-BASED EXTENSION EDUCATION COURSE,
LESOTHO, 1985

FIGURE 7.15	SKILLS CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985	378
FIGURE 7.16	ASPIRATION CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985	379
FIGURE 7.17	PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985	381

LIST OF TABLES

TABLE 5.1	BIOGRAPHICAL DATA ON MEMBERS OF FARMER CONTACT GROUPS, LESOTHO, 1985	208
TABLE 5.2	TOTAL CHANGES IN KNOWLEDGE, ATTITUDE, SKILLS, ASPIRATIONS AND PRACTICE CHANGE BY 54 RESPONDENTS IN AGRONOMY, HORTICULTURE PLANT PROTECTION, FARM MACHINERY AND ANIMAL AND RANGE MANAGEMENT, AS A RESULT OF EXTENSION EDUCATION PROGRAM- MES 1979 - 1984, LESOTHO, 1985	222
TABLE 5.3	KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING ONE EXTENSION EDUCATION COURSE, LESOTHO, 1985	231
TABLE 5.4	KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING TWO EXTENSION EDUCATION COURSES, LESOTHO, 1985	232
TABLE 5.5	KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING THREE EXTENSION EDUCATION COURSES, LESOTHO, 1985	233
TABLE 5.6	KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING FOUR EXTENSION EDUCATION COURSES, 1985	234
TABLE 5.7	END RESULTS (REAL BENEFITS) TO MEMBERS OF FARMER CONTACT GROUPS OF EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985	244

TABLE 5.8	GROWTH IN REAL BENEFITS TO FARMERS WITH INTENSITY OF EXTENSION EDUCATION PROGRAM- MES, LESOTHO, 1985	250
TABLE 5.9	DIFFUSION EFFECTIVENESS OF INDIVIDUAL RESPONDENTS, LESOTHO, 1985	253
TABLE 5.10	DIFFUSION EFFECTIVENESS OF RESPONDENTS ACCORDING TO AGE AND FARMING EXPERIENCE, LESOTHO, 1985	255
TABLE 6.1	RESPONSES OF CHIEFS AND HEADMEN/WOMEN TO QUESTIONS ON PERCEIVED KASA AND PRACTICE CHANGE RELATED TO FSR EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985 (RAW SCORES)	275
TABLE 6.2	RESPONSES OF CHIEFS AND HEADMEN/WOMEN TO QUESTIONS ON PERCEIVED KASA AND PRACTICE CHANGE RELATED TO FSR EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985 (PERCENTAGES)	276
TABLE 7.1	STRENGTHS OF EXTENSION SCHOOLS, LESOTHO, 1985	327
TABLE 7.2	SUMMARY OF RESPONDENTS' PREFERENCE OF EXTENSION METHODS IN PERCENTAGES, LESOTHO, 1985	329
TABLE 7.3	PREFERENCE OF SELECTED EXTENSION METHODS BY DISTRICTS, LESOTHO, 1985	331
TABLE 7.4	KASA AND PRACTICE CHANGE SCORES FOR EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS IN PAW RESPONSES FOR THE MAZENOD COURSE, LESOTHO, 1985	348
TABLE 7.4 (cont'd)	KASA AND PRACTICE CHANGE SCORES FOR EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS IN PERCENTAGES FOR THE MAZENOD COURSE, LESOTHO, 1985	349
TABLE 7.5	TOTAL KASA AND PRACTICE CHANGE RESPONSES FOR ALL TOPICS BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, LESOTHO, 1985	361
TABLE 7.6	TOTAL KASA AND PRACTICE CHANGE RESPONSES IN PERCENTAGES BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, TOPICS IN ORDER OF PRESENTATION, LESOTHO, 1985	362

TABLE 7.7	TOTAL KASA AND PRACTICE CHANGE RESPONSES FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, TOPICS SEGREGATED INTO AGRICULTURE AND EXTENSION, LESOTHO, 1985	363
TABLE 7.8	KASA AND PRACTICE CHANGE RAW SCORES FOR PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985	369
TABLE 7.9	KASA AND PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE IN RAW SCORES, LESOTHO, 1985	375
LISTS OF APPENDICES		
APPENDIX A.1	INTERVIEW QUESTIONNAIRE (FCG)	399
APPENDIX A.1.1	LIPOTSO (F)	410
APPENDIX A.2	INTERVIEW QUESTIONNAIRE (CHMW)	421
APPENDIX A.2.1	LIPOTSO	427
APPENDIX A.3	INTERVIEW QUESTIONNAIRE (M)	433
APPENDIX A.4	INTERVIEW QUESTIONNAIRE (AH)	439
APPENDIX A.5	INTERVIEW QUESTIONNAIRE (RD)	446
APPENDIX A.6	INTERVIEW QUESTIONNAIRE (DB)	452
APPENDIX B.1	KASA AND PRACTICE CHANGE IN AGRONOMY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COUR- SES, LESOTHO, 1985 (ONE COURSE)	458
APPENDIX B.1	KASA AND PRACTICE CHANGE IN AGRONOMY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COUR- SES, LESOTHO, 1985 (TWO COURSES)	459
APPENDIX B.1	KASA AND PRACTICE CHANGE IN AGRONOMY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COUR- SES, LESOTHO, 1985 (THREE COURSES)	460

APPENDIX B.1	KASA AND PRACTICE CHANGE IN AGRONOMY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COUR- SES, LESOTHO, 1985 (FOUR COURSES)	461
APPENDIX B.2	KASA AND PRACTICE CHANGE IN HORTICULTURE MANAGEMENT FOR RESPONDENTS ATTENDING IN- CREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (ONE COURSE)	462
APPENDIX B.2	KASA AND PRACTICE CHANGE IN HORTICULTURE MANAGEMENT FOR RESPONDENTS ATTENDING IN- CREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (TWO COURSES)	463
APPENDIX B.2	KASA AND PRACTICE CHANGE IN HORTICULTURE MANAGEMENT FOR RESPONDENTS ATTENDING IN- CREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (THREE COURSES)	464
APPENDIX B.2	KASA AND PRACTICE CHANGE IN HORTICULTURE MANAGEMENT FOR RESPONDENTS ATTENDING IN- CREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (FOUR COURSES)	465
APPENDIX B.3	KASA AND PRACTICE CHANGE IN PLANT PROTEC- TION FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (ONE COURSE)	466
APPENDIX B.3	KASA AND PRACTICE CHANGE IN PLANT PROTEC- TION FOR RESPONDENTS ATTENDING INCREA- SING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (TWO COURSES)	467
APPENDIX B.3	KASA AND PRACTICE CHANGE IN PLANT PROTEC- TION FOR RESPONDENTS ATTENDING INCREA- SING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (THREE COURSES)	468
APPENDIX B.3	KASA AND PRACTICE CHANGE IN PLANT PROTEC- TION FOR RESPONDENTS ATTENDING INCREA- SING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (FOUR COURSES)	469
APPENDIX B.4	KASA AND PRACTICE CHANGE IN FARM MACHI- NERY FOR RESPONDENTS ATTENDING INCREA- SING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (ONE COURSE)	470
APPENDIX B.4	KASA AND PRACTICE CHANGE IN FARM MACHI-	471

	NERY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (TWO COURSES)	
APPENDIX B.4	KASA AND PRACTICE CHANGE IN FARM MACHINERY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (THREE COURSES)	472
APPENDIX B.4	KASA AND PRACTICE CHANGE IN FARM MACHINERY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (FOUR COURSES)	473
APPENDIX B.5	KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (ONE)	474
APPENDIX B.5	KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (TWO)	475
APPENDIX B.5	KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (THREE)	476
APPENDIX B.5	KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985 (FOUR)	477
APPENDIX B.6	BENEFITS ACCRUING TO RESPONDENTS ATTENDING ONE EXTENSION COURSE, LESOTHO, 1985	478
APPENDIX B.7	BENEFITS ACCRUING TO RESPONDENTS ATTENDING TWO EXTENSION COURSES, LESOTHO, 1985	479
APPENDIX B.8	BENEFITS ACCRUING TO RESPONDENTS ATTENDING THREE EXTENSION COURSES, LESOTHO, 1985	480
APPENDIX B.9	BENEFITS ACCRUING TO RESPONDENTS ATTENDING FOUR EXTENSION COURSES, LESOTHO, 1985	481
APPENDIX B.10	KNOWLEDGE CHANGE IN AGRICULTURAL SUBJECTS	482

FOR PARTICIPANTS IN THE AIRPORT HOTEL
EXTENSION COURSE, LESOTHO, 1985

APPENDIX B.11	ATTITUDE CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985	483
APPENDIX B.12	SKILLS CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTEN- SION EDUCATION COURSE, LESOTHO, 1985	484
APPENDIX B.13	ASPIRATIONS CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985	485
APPENDIX B.14	PRACTICE CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, LESOTHO, 1985	486
APPENDIX B.15	KNOWLEDGE CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTEN- SION COURSE, LESOTHO, 1985	487
APPENDIX B.16	ATTITUDE CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTEN- SION COURSE, LESOTHO, 1985	488
APPENDIX B.18	ASPIRATIONS CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, LESOTHO, 1985	489
APPENDIX B.17	SKILLS CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EX- TENSION COURSE, LESOTHO, 1985	490
APPENDIX B.19	PRACTICE CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EX- TENSION EDUCATION COURSE, LESOTHO, 1985	491
APPENDIX C.1	RESPONSES FOR SAMPLE ATTENDING ONE EXTEN- SION EDUCATION COURSE, LESOTHO, 1985	492
APPENDIX C.2	RESPONSES FOR SAMPLE ATTENDING TWO EXTEN- SION EDUCATION COURSES, LESOTHO, 1985	493

APPENDIX C.3	RESPONSES FOR SAMPLE ATTENDING THREE EXTENSION EDUCATION COURSES, LESOTHO, 1985	494
APPENDIX C.4	RESPONSES FOR SAMPLE ATTENDING FOUR EXTENSION COURSES, LESOTHO, 1985	495
BIBLIOGRAPHY		496
SUMMARY		513



Map of Lesotho showing the three Farming Systems Research prototype areas: Molumong, Nyakosoba, Siloe.

CHAPTER I INTRODUCTION

1.1 ORIENTATION

Nonformal education is today a generic label which identifies a family of educational activities which happen outside the formal school system and which provide learning opportunities for people not easily reached by the formal system. One sector of those activities addresses the continuing needs of the employed labour force. Agricultural extension education is a familiar example. It is that form of nonformal education developed specifically for agriculture. Thus extension education prevails worldwide in the agricultural context. Another sector attempts to prepare people, mainly youth, for entry into the labour force. Many vocational training programmes are typical of that endeavour. A third sector seeks to provide learning experiences which transcend the world of work, such as adult literacy, survival skills and cultural enrichment courses. All forms are adaptable toward meeting the needs of the rural poor, the population most neglected by the world's formal education systems. Development strategists now admit that nonformal education including extension education is vital to the crucial problem of rural poverty worldwide.

While leading thinkers search for integrated approaches to improving productivity and enhancing the quality of life for countless millions, the rural sector of the developing world is being urged to produce more food even while suffering the debilitating effects of poverty on their own lives.

Agricultural development strategies have followed one upon another for decades. Colonial concepts gave way to erroneous assumptions about technology transfer. Appropriate technology models were largely unable to break their ties to westernized "top-down" theories, and the technology "packages" which produced the Green Revolution, with the exception of India, have fallen on hard times. In short, there have been decades of failure, punctuated by rare and sporadic successes, in agricultural and rural development endeavours. It is now widely felt that community based, integrated approaches may hold the last best hope for the immediate and long range future in coping with rural poverty, and that nonformal education must be a critical component in development formulae henceforth.

It is not that the value of education per se was ignored in former years. Certainly, post-colonial times have seen the expansion of formal school systems and university programmes, with unprecedented overseas study opportunities for Third World nationals. But only recently has it been

fully realized that formal schooling does not adequately address the real issues of rural poverty, nor do returning "technocrats" effectively come to grips with the reasons for the low productivity of rural families within their own countries. The expansion and upgrading of formal education systems is applauded, for it most certainly has its vital place in developing societies. Nonformal education must complement, rather than replace formal systems. But, in the case of rural development, it is nonformal education which must take the lead since the rural poor are now, and presumably will always be, hopelessly outside the reach of formalized school networks.

To state that nonformal education is not formal is not to insinuate that it is not organized. Indeed, it is organized nonformal education which is critical to the grass-roots, self-help, integrated strategies for rural development because it can be "transported" to the scene of dire need, it can address needs directly at low cost, it can be flexibly moulded to "fit" villagers' perceptions of their environments, its results can be quickly reinforced, and learners can participate in their own self-enlightenment.

Farming systems research (FSR) is one such strategy that seeks to orient agricultural investigation in such a way that scientists become problem solvers in partnership with

poor farmers whose productivity is constrained by factors and situations as they perceive them. By understanding the farming "system" as such farmers envisage it and interact with it, scientists contribute to mutually discovered innovations which should have an enhanced probability of being tried and ultimately adopted by the farmers who share in the discovery. It is likewise expected that mutually discovered innovations and technologies generated in partnership with poor farmers will be more readily accepted by a wider rural population living under similar constraints than will potential "solutions" handed down by researchers and educators remote to environmental realities as seen through farmers' eyes. Finally, it is expected that extension educators in developing countries will see the wisdom of the strategy and systematically promote knowledge and skills, generated by FSR, among farming communities.

At every step in the FSR strategy, extension education is critical since poor farmers are partners in the entire process. Those farmers must be encouraged to replicate and share potential solutions to farm problems, which they themselves help discover, through purposeful and proactive extension education dynamics. Diploma or graduate extension educators must become part of the FSR strategy intellectually and experientially since extension education is the key to the diffusion of desired change.

1.2 THE FIELD OF THIS STUDY

This study addresses the role of extension education in farming systems research in the Kingdom of Lesotho from 1979 - 1984 as practiced by Washington State University faculty members, under contract with the United States Agency for International Development and in integrated collaboration with personnel of the Research Division of the Lesotho Ministry of Agriculture and Marketing.

The study includes general reference to literature describing the relationship of nonformal education to integrated rural development and more specifically extension education in agriculture. This is done to provide a frame of reference for professional educators and other development practitioners whose fields are not in agriculture. It also cites descriptive literature about farming systems research as a development strategy for agriculture, emphasizing its extension education component. It then investigates the impacts of FSR extension education programmes in Lesotho on three audiences over a five year period in terms of perceived changes in knowledge, attitudes, skills, aspirations, practice, and end results or real benefits; and it seeks to determine the extent to

which farmer contact groups are themselves disseminators of innovative agricultural information.

The study does not evaluate FSR as a strategy in any other aspect besides its extension education impact nor in any other country besides Lesotho. The extension education activities during 1985 and 1986 may be briefly described or forecast merely to bring totality to the Lesotho FSR intervention and do not form part of the data base for this impact assessment.

As a major integrated, farmer-oriented research strategy for addressing the basic agricultural needs of the rural poor in Lesotho, the Farming Systems Research Project has been active in three agroclimatic prototype areas since 1979 in a seven-year continuous intervention. Intensive extension education programmes in agriculture, contemplated in the FSR project rationale, have been conducted during four years among farmer contact groups. Prototype area chiefs and village headmen/women have received extension instruction in agricultural development during two consecutive years. Continuing education programmes in extension methods and agriculture for district-based extension workers and subject matter specialists have been carried out over a four-year period*.

* These education programmes for ministry personnel were not limited to prototype areas, but were conducted nationwide.

No matter how philosophically and operationally attractive the FSR strategy seems to be in the minds of practitioners, its efforts are essentially wasted unless the outcomes can be measured in terms of behavioural change among members of target clienteles. Since FSR in Lesotho conducted its extension education endeavour on the three fronts mentioned above, the three clienteles are evaluated separately. However, it is expected, over time, that mutually strengthening relationships may develop among those clienteles whose ultimate aims overlap substantially. Such relationships require time, and current investigation into the extent of their existence is not attempted within the scope of this study.

1.3 THE PURPOSE OF THE STUDY

In order to determine the impacts such extension education programmes have had in the farming systems research context in Lesotho on the three major clienteles involved, the purpose of this study is:

- to investigate the role of nonformal education in meeting the needs of the rural poor;
- to ascertain the place of extension education in agricultural development;

- to inquire into the relationship of extension education to the farming systems research strategy;
- to analyze the impact of farming systems research extension education programmes on members of farmer contact groups in three Lesotho prototype areas, as perceived by members;
- to determine the momentum of farming systems research farmer contact groups as disseminators of innovative agricultural information in Lesotho prototype areas;
- to document the effect of extension education programmes on prototype area Basotho chiefs and village headmen/women, as appraised by same;
- to determine the impact of farming systems research continuing extension education programmes on district-based agricultural extension workers and subject matter specialists in Lesotho, as reported by participants nationwide;
- to discover other findings of relevance to the development and improvement of future farming systems research and extension education programmes.
- Extension education programmes for members of farmer contact groups and for chiefs and headpersons, evaluated in Chapters 5 and 6, were conducted only in the three agroclimatic prototype areas. Programmes conducted for ministry personnel were carried out nationwide.

1.4 METHODS OF INVESTIGATION

The decision to evaluate and analyze the impacts of FSR extension education programmes in Lesotho was reached during the fifth year of the Farming Systems Research Project life and during the third year of the principal researcher's tenure in the country. Earlier concentration of the principal researcher's time and expertise was focused on the extension education programmes themselves and on such ancillary activities as planning information services, institution-building, radio diffusion, and reporting. The study thus becomes one of retrospective investigation. As a result, it is necessary to review literature illuminating the evolution of nonformal education in the context of rural development and extension education in agricultural development. More importantly, it is critical to select an evaluative/investigative technique which is retrospective in nature, given that so few evaluative parameters were established at the outset of the FSR extension education programmes. Finally, analytical techniques are chosen on their appropriateness for the determinations to be made, and consistent with the strength and structure of the data collected.

1.4.1 The literature review

A fundamental function of the literature review is to study evaluative, investigative and analytical methodologies in order to select appropriate means for determining the impacts of the extension education programmes being studied.

The literature search further includes a review of the major works, schools of thought and writers concerned with the field of nonformal education in the Third World, with special emphasis on works demonstrating its critical essence in meeting the needs of the rural poor. This sector of the literature review forms the foundation and argumentative data for Chapter 2, and focuses on the role of nonformal education in connection with rural development strategies. It thus forms the intellectual basis for Chapter 3. A continuation of the literature review then examines evidence of nonformal type education in contemporary agricultural programmes, emphasizing its role, and seeks to substantiate its importance. This contributes to the text of Chapter 3 which also cites relevant literature to develop the concept of "extension" education in agriculture.

The literature review in Chapter 4 explores the philosophy and conceptual framework of the farming systems research

(FSR) strategy for agricultural development, and extension's role in that context. It provides the foundation for an examination of more primary documentation about FSR in Lesotho. This latter, largely descriptive, brings the study to its local scenario and elucidates those extension educational experiences which are to be evaluated and analyzed in Chapters 5, 6 and 7.

1.4.2 The evaluative/investigative model

The evaluative/investigative model chosen for the study is the Reflective Appraisal of Programmes (RAP), an approach to studying clientele-perceived results of extension programmes (Bennett, 1982). The choice follows examination of a number of methodologies according to their appropriateness for the task involved.

Campbell and Stanley (1966, pp. 6 - 66) describe a number of experimental and quasi-experimental designs for research that suggest some applicability to the conditions which obtain in the present study. What they term the one shot case study is structurally useful in the case of evaluating FSR education programmes. The authors, however, dismiss the case study as scientifically unsound since both pretest and control factors are absent from the formula. Bennett (1982, p.4.) in effect disagrees, as his methodology, subsequently

discussed, assigns important evaluative and investigative value to reflective appraisal of extension education programmes by clients. The static-group comparison described by Campbell and Stanley includes the basic treatment and observation relationship but calls for a control group. Other designs described by the same authors which contain useful constructs but require other components such as pretest, control or other comparative groups include the Solomon four-group, posttest-only control group, the separate-sample pretest-posttest, the separate-sample posttest control group and the recurrent institutional cycle design. Campbell and Stanley do lend some credibility to what they call the retrospective pretest by describing cases of posttest interviews among compared groups in which no significant differences were found in prior attitudes, or presumably in prior knowledge or practices. That conclusion would seem to complement the notion of the strength of reflective appraisal of programmes (RAP).

Fox (1969, pp. 423 - 434) provides valuable guidelines to several components of the current research problem. He discusses elements of the descriptive survey, the retrospective survey and the evaluative survey. Aspects of all of these are useful. Although the information produced by a purely descriptive exercise would not be sufficient to satisfy the elements of the purpose of study, the

descriptive component is an important phase of the research. Certain principles of the retrospective survey are useful only insofar as a general precondition to the FSR extension education programmes to be evaluated can be indirectly generated. The evaluative survey elements are also useful inasmuch as evaluation of change over time is the essence of the current exercise. The single criterion in the Lesotho case is the tentative impact of the extension education programmes in question, a model for which Fox does not clearly supply. Also, the precondition question would seem to elude Fox's description of the evaluative survey technique.

In a classic volume on cooperative extension work, Kelsey and Hearne (1949, pp.219 - 220) point out the vital purposes and importance of evaluation of extension education programmes and stress evidence of changed behaviour as the central measure of such evaluation. They likewise provide helpful hints on the evaluation process with respect to measurement, sampling procedures and summarization of data. Leedy (1974, p.79) is particularly enlightening on processes quite appropriate to the research task at hand in his treatment of the descriptive survey method in which his discussion of questionnaires, interviews, sampling and interpretation of data are relevant. The singular constraint to the Leedy approach is its rather broad

application to the social sciences with little direct reference to extension education programmes in agriculture.

The evaluative/investigative technique known as reflective appraisal of programmes (RAP) (Bennett, 1982) has been selected as that most suitable for the research task at hand and is the technique followed during the rest of the study, with maximum freedom allowed during the analytical phase. RAP is an approach to studying clientele-perceived results of extension education programmes which was developed in collaboration with a number of American practitioners as a logical methodology emanating from earlier extension programme evaluation work (Bennett 1976, and 1980). The methodology is designed to determine the changes which extension programme participants perceive to have occurred subsequent to and as a result of their participation. It does that by collecting systematic reflective evidence from participants by means of standardized questionnaires and interviews and then analyzing such data to determine its significance (Bennett 1982, pp. 1 - 9). It contemplates selecting programmes for study, setting level(s) of evidence to be evaluated (Bennett 1976 and 1980), developing appropriate questionnaire/interview instruments, gathering data, analyzing data and making conclusions and recommendations.

The development of RAP grew out of a need for practitioners themselves to be able to research the results of extension education programmes in order to determine trends and recommend improvements. The major feature of RAP which makes it particularly useful for research by practitioners, is its simplicity. It employs a step by step model for studying extension education programmes. In the words of its author and principal proponent, "specifically, RAP is a standardized application of a level-of-evidence model (Bennett, 1980) for evaluating the results of extension programmes (Bennett, 1976)".

Further, the methodology is as appropriate to human development programmes as it is to those in agricultural innovation. It can be carried out by the practitioner and his colleagues on the job and becomes part of and not divorced from, on-going programme activities. RAP is a state of the art methodology approved by the U S Department of Agriculture for the study of cooperative extension programmes by practitioners.

There are arguments for and against the validity of reflective evidence in the appraisal of extension education programmes. Objectivists hold that what clients perceive or believe about an education programme in which they have participated, is what they want to believe in order to make

themselves look good before the investigator. Objectivists also suggest that memory loss and distortion invalidate selective evidence, and insist on physical sciences models for impact studies. Subjectivists, Bennett (1982, p.6) among them, counter that human education is perception and that meaningfulness depends on perceptiveness. These subjectivists further hold that perception permits respondents to interconnect and make cumulative sense of programmes which transcends both time and methodology, that perceptual data is highly descriptive and that reflective evidence can be gathered after programme participation by clients only. This latter characteristic obviates the need for base data before programmes or for control group data. Follow-up questions, both open and closed-end, and verification of data activities can detect widespread distortion of fact. Last, subjective collection of reflective evidence of programme impacts may still be analyzed rather rigorously for meaningful and significant relationships. The principal researcher joins Bennett in his commitment to the subjectivist approach, and it is with the RAP methodology that this study proceeds.

Measures must be taken to reduce constraints to RAP. The bias which could arise from the vested interests of the principal researcher, is offset by having ample critique and review of the data collection instruments by qualified

researchers and by sharing the interview task with other colleagues to achieve balance. Two additional RAP constraints are commonly voiced by critics. They hold that RAP's standardized questioning procedure tends to produce responses which are too vague, and that reflective evidence tends to document feelings toward extension personnel rather than results of programmes. The principal researcher is convinced that effective follow-up questioning essentially reduces such constraints. Questions can include open-end probes, closed-end probes and actual observed verification of data. It thus becomes untenable for respondents to render unduly high or inaccurate scores and yet avoid the check system of providing detailed follow-up descriptions, which may be subject to further verification. A final argument by critics suggests that respondents forget programmes and the effects of programmes. As this constraint, like others before, has an element of truth, efforts are made to investigate clearly identifiable programmes, over a reasonably short time period, refreshed by a concisely stated description of the programme contained in the data collection instrument. After all constraints are addressed it is still felt that the RAP approach toward the investigation of the impacts of extension education programmes in this instance is suitable.

1.4.3 Questionnaires

The questionnaire format used in the current investigation is the standardized but modifiable model which is part of the RAP investigative "package" (Bennett 1982, pp. 9 - 14). That choice is not made without enlightening inputs and helpful pointers from other researchers and authors. Yang (1955 pp. 51 - 53), for example, argues that the questionnaire is a quick and easy method for gathering data among beneficiaries of programmes but advises and cautions on a number of critical points. He states that questionnaires must be of limited scope and length, questions must be specific and clear, and that superfluous words and unnecessary questions should be avoided. Yang further explains the appropriateness of the closed and open forms of questionnaires. His comments on advantages and limitations of questionnaires tend to be directed toward the mailed instrument and are not appropriate to this exercise.

Fox (1969, pp. 525 - 526) elaborates on questioning as a data collection method appropriate to the social sciences, since answers to important questions must come from people, and questioning is a highly interactive method of compiling those answers. He is a proponent of its usefulness in descriptive, retrospective and evaluative surveys as he argues the logic of getting answers by asking questions. He

feels questioning is really the only practical method for data collection in retrospective research. Fox then explores all the elements of the questioning method which he enumerates as (1) context, (2) content, (3) question, (4) provision for answering, (5) recording of answers, and (6) the nature of the research-respondent relationship. Fox continues his writings with a highly intellectual treatment of the concepts and theory underlying the questioning method.

Bennett (1982, pp. 9 - 14) brings the matter back into focus as he provides step by step instructions for preparing the interview instrument (questionnaire) which becomes the standardized but modifiable model for the RAP methodology. His questionnaire includes the selection of evidence levels to be studied, a description of the programmes, the use of closed-end items and probe questions, validation and people involvement, determining reactions, documenting KASA* change, practice change, and the end results of extension education programmes.

*KASA is an acronym meaning knowledge, attitudes, skills and aspirations.

1.4.4 Interviews

It is important to note that the RAP questionnaire (Bennett, 1982, p. 9) is an interview questionnaire. It is a standardized but modifiable data collection instrument to be used as part of a personal, face-to-face interview with the respondent. In his instructions for interviewing programme participants, Bennett adheres to accepted interviewing principles. He guards against vested-interest bias of the principal researcher, gives guidance to the training of interviewers and explores interpersonal techniques for interviewing. These aspects of the current study in a Lesotho setting are discussed in Chapters 5, 6, and 7.

Bennett seems to be on sound ground in his suggested interviewing techniques, but extreme care is required in order to heed the admonishments of Yang (1955, pp. 41 - 42) and Fox (1969, p. 538). Yang warns about suspicion towards outsiders, the tendency toward distortion by respondents and the temptation toward digression. Fox is concerned about the sensitivities of the researcher-respondent relationship which can be influenced by such factors as skin colour, language, sex and quality and style of dress. How the principal researcher has dealt with cross-cultural

sensitivity issues in adapting RAP to Lesotho conditions is explained in Chapters 5, 6, and 7.

1.4.5 Verification of data

In implementing RAP in the Lesotho setting, Yang's (1955, p. 41) warning about distortion is not taken lightly. It can readily be seen that Lesotho national farmers might resist disclosure of fact, Basotho chiefs might wish to impress, and national agricultural professionals might wish to befriend the researcher and his colleagues. Measures taken to reduce the unavoidable constraints to RAP have been mentioned earlier and are more fully treated in subsequent chapters*.

Notwithstanding, it is felt that any perceived tendency toward exaggeration of responses will be general, uniform and relative. Open-end probes should return the responsibility for truthfulness directly to the respondent even before he finishes with the interview. Perceived gross exaggeration or contrived fable can be checked by direct observation or cross-checking with superiors. Implementation of such verification measures hinges on the trained perceptions of the principal researcher.

* It is anticipated that responses by African farmers may be unduly high, indicating overly optimistic levels of perceived change. Thus, careful analysis is warranted.

1.4.6 Analysis of data

Bennett has many suggestions he feels are consistent with his evolutionary development of the RAP model. Yang has his style for presentation of findings which is both simple and relevant to rural people in the developing world. Leedy has written a whole guide book for social science research and Fox's monumental volume deals with every aspect of the research process in education. The choices range from simple descriptive and illustrative presentation of findings by such constructs as bar charts, line graphs, pie charts and tables to a wide variety of statistical analyses. The exercise may or may not involve computer technology since the nature of the task to be accomplished will condition that decision. Assurances are in order that materials, expertise, counsel, software, hardware and intellectual capacity are available to the researcher, regardless of choice of methodology. Detailed descriptions of analytical techniques are found in Chapters 5, 6 and 7.

Since it is already established that data produced by the RAP methodology are reflective, perceptive and at best subjective, findings may be expected to be tentative. They should, nonetheless, provide valuable indicators of learning, adoption and benefits. Care however, is required in interpreting such data.

1.5 EXPLANATION OF TERMS

Agricultural development	The improvement of all aspects of the agricultural sector of a region through education, technology and infrastructure.
Animation rurale	The French extension education philosophy and process.
Continuing education	The updating of the knowledges and skills of professionals and technicians through nonformal education programmes.
Cooperative extension	The nonformal education programme of the American land grant university system in cooperation with the U S Department of Agriculture and American counties. The largest nonformal education system in the world.
Extension	Or extension education; nonformal education, usually in agriculture and rural life, associated with land grant universities in America but with ministries of agriculture and others concerned with nonformal education in numerous other countries.
Farm Bill of 1981	Legislation empowering the U S Secretary of Agriculture, under Title XIV, to assist USAID with development programmes and to assist the land grant universities to do likewise.

Farmer contact groups	Groups of farmers organized for the promotion of an activity, mainly extension education and agricultural or rural development.
Farming system	The whole complex of activities that a farming household engages in to sustain their livelihood, including off-farm sources of income.
Farming systems research	A development strategy in which scientists engage farmers in joint on-farm research and extension in order to solve problems as perceived and identified by the latter.
Land grant university	One of a group of U S universities created by the Morrill Act of 1862 to teach agriculture and related subjects. Agricultural research and extension were added to the land grant university mandate by subsequent legislation.
Objectivists	A research community which holds that only objective, empirical and scientifically obtained evidence is useful in the investigation of research problems.
Nonformal education	That realm of educational activity outside the formal education system which is frequently divided into continuing, vocational and cultural enrichment and survival areas.

Pitso	Traditional public assembly in Lesotho convened by chief of exchange information.
Prototype area	In the context of this study, an agroclimatic area designated for the development of viable agricultural enterprises through farming systems research.
Reflective appraisal of programmes (RAP)	A methodology for the study of clientele-perceived results of cooperative extension education programmes, developed by Claude Bennett of the United States Department of Agriculture in collaboration with land grant university colleagues.
Rural development	The improvement of all aspects of rural life including agriculture, but also addressing education, health, housing, transportation, etc.
Smith-Lever Act of 1914	Legislation which created the Cooperative Extension Service in the United States.
Subjectivists	A research community which admits reflective, affective and perceptive evidence as valid in the investigation of research problems in the social sciences.
Technocrats	Scientists and technicians who participate in government administration.

Title XII

A provision of the International Development and Food Assistance Act of 1975 which gives a mandate to American land grant universities to share in the international agriculture development task.

T & V

Training and visit (system). An extension strategy, developed by Daniel Benor in India and widely adopted by World Bank, based on frequent scheduled training by extension specialists of extension workers who, under extension supervisors' jurisdiction, conduct rigorously scheduled visits to organized farmer groups in order to share relevant information. The system works in cyclical fashion.

United
States Agency for
International
Development (USAID)

A U S government agency in charge of the implementation and monitoring of American foreign technical assistance programmes.

United States
Department of
Agriculture
(USDA)

The American government department in charge of agricultural policy and development, including the cooperative extension programmes.

1.6 ABBREVIATIONS

AIS	Agricultural Information Services (of the Lesotho Ministry of Agriculture).
ARDRI	The Agricultural and Rural Development Research Institute at University of Fort Hare, Ciskei.
CIMMYT	The Centro Internacional de Mejoramiento de Maiz y Trigo in El Batan, Mexico (also in Swaziland).
FAO	Food and Agriculture Organization of the United Nations.
FSAR	Means Farming Systems Approach to Research.
FSR/E	Farming Systems Research and Extension.
FTC	Farmers' Training Centre.
FMA	Farm Management Assistant.
GOB	Government of Botswana.
IRRI	The International Rice Research Institute in Los Banos, Phillippines.
KASA	An acronym used in Claude Bennett's extension education evaluation models signifying measurable change in knowledge, attitudes, skills and aspirations.

LAC	Lesotho Agriculture College.
LDC	A development acronym for lesser developed country.
OFR/FSP	Means on-farm research with a farming systems perspective.
MOA	Ministry of Agriculture.
PCV	Peace Corps Volunteer.
REA	Research extension assistant.
RD	Research Division (of the Lesotho Ministry of Agriculture).
RDA	An acronym signifying rural development area. This is used to delimit areas brought under the Rural Development Area Programme in Swaziland.
UNESCO	An acronym for United Nations Educational, Scientific and Cultural Organization.
WSU	Washington State University.

CHAPTER 2 NONFORMAL EDUCATION AND THE NEEDS OF THE RURAL POOR

2.1 BACKGROUND

Contemporary development strategists have reached agreement on two basic operating premises. First, development must become integrated and participative in order to endure. And second, nonformal education must be central to strategies designed to meet the needs of the rural poor. The challenge to nonformal education posed by world poverty in the rural areas demands creativity, commitment and massive support in order to help forestall and hopefully reverse the effects of famine, pestilence, human outrage, deteriorating resources and unprecedented destitution around the globe.

Development appears in modern times wearing many hats, espousing many schemes and prescribing many cures. Yet, the recognizable statement that the poor will always be with us has never rung more true. While technology has reached dizzying heights in recent years, rural poverty has reached global dimensions and its devastation of humanity and the earth environment is accelerating. Amidst the wreckage are found the relics of decades of misguided and failed development schemes, the goals and objectives of which somehow ran aground.

The early 1980's have seen a rethinking among major donor organizations and nations of the components and dynamics of development. New formulae have been conceived for development funding, focusing especially on the needs of the rural poor. These new formulae call for an integrated rural development approach which touches on all aspects of rural life. Among these are agricultural productivity, the condition of women and children, the plight of minorities, rural employment and role of the people in the development process (Coombs, 1980 p. 1).

Coombs (1980, p.2) further suggests that such integrated rural development approaches must include such service areas as agriculture, health, education, nutrition, child care and women's programmes, family planning and vocational training. This type of approach, he argues, will tend to rectify the gross inequities of former government sectoral schemes. He cites past agricultural extension programmes as an example of those rural development activities which benefited too few at the expense of too many.

According to Coombs (1980, p.11), development practices which were based on the notion that economics was the singular guiding principle of development and that GNP was its measure of success, were found to fail repeatedly around the world. The notions of basic needs and quality of rural life and poor majority have become the focus of new thinking.

Community-based self-help emphases have become a vehicle for integrated rural development in the 1980's and major national, international and voluntary funding agencies have made public policy statements reflecting that redirection of focus. As a prerequisite for new programmes of this type, agencies have begun to place emphasis on getting to know the rural poor (Coombs 1980, p.12), understanding their problems as perceived by poor family householders and involving beneficiaries in both planning and programmes. That philosophy strongly influences the central rationale of farming systems research and extension, as will be seen in Chapter 4.

The World Bank moved away from the intensive trickle-down

and Green Revolution tactics toward a more vast but equitable set of programme guidelines (Schumacher, 1977, pp. 31- 35). He cites the PIDER Project of Mexico as an example of that shift.

The United States Agency for International Development* began to shift its programme emphasis toward the rural poor in the early 1970's fielding projects since that time in the broad-spectrum areas of food and nutrition, education and human resources, and health and population, claims Farrar (1977, pp. 36 - 38). He also stresses the need to know much more about the rural poor populations to be served and points out the difficulties in this respect.

Magagula (1978, pp. 16 - 17), analyzing and evaluating rural development areas in Swaziland, finds the development of the rural sector fundamental to comprehensive social and economic development. He states that "there also seems to

*The United States Agency for International Development is widely referred to by its acronyms AID or USAID.

be a growing realization that the rate of diffusion of innovations and the success of any economic development initiative cannot be explained fully and adequately in purely technical and economic terms but is intimately related to factors which can be understood only by employing an interdisciplinary approach. What this implies is that, in order to fully comprehend the complex process of development, developmentalists must probe far beyond the proximate economic variables". He concludes that the success of field programmes is closely associated with social and cultural considerations.

A decentralized diffusion system in which users of innovations actually generate such innovations which are problem-focused and which are then diffused by means of informal horizontal networks, is envisioned by Rogers (1983 pp. 160 - 161). He feels these networks can effectively complement the more centralized systems.

Fourie (1981 p. 125), summarizes the trend toward integrated development by stating that there are "good signs that more and more leaders in the field of development are becoming strong protagonists of a multidimensional approach. Economic development and

growth are not considered by them as exclusive objectives. The attainment of non-economic ideals must also be considered as important for the improvement of the quality of life and the multiplication of happiness. It must be remembered that the objectives of total development can only be achieved by a hard working people".

The foregoing is sufficient to elucidate the strong trend of the 1980's toward integrated, multidisciplinary approaches to development. It is within that context that the role of nonformal education in the development process is examined.

2.2 NONFORMAL EDUCATION

Nonformal education plays a critical and central role in the various integrated, multidisciplinary strategies for meeting the basic needs of the rural poor.

Laker (1981, pp. 62 - 87) believes that a cadre of strong agricultural specialists is fundamental to meaningful agricultural community development which forms a part of, and is a tool for, a greater national development thrust.

He further states that the notion that generalists are more appropriate to agricultural development than specialists is a fallacy; but that scientists and specialists, supported by extensionists (nonformal educators) and others, form the best development team. He concludes that small farmer strategies must count on improved education of farmers as a vital component.

In writing on liberation, development and rural nonformal education, La Belle (1977, p. 211) includes agricultural extension, consciousness raising, vocational training, literacy, family planning, basic education and community development as legitimate arenas for nonformal education in the improvement of personal status, endowment of power, development of knowledges and skills and shaping of attitudes and values. La Belle suggests that formal, nonformal and informal education forms are not mutually exclusive, but that each contains elements of the others.

Vermaak (1984, pp. 18 - 24) rendered a report on the relationship of nonformal education to development in which he traces the lag of formal education in its attempt to cope with maladjustment, high costs and population growth. He recognizes the shift in development thinking

away from economic and GNP language toward the inclusion of human and social factors. Against that scenario the Research Institute for Education Planning of the University of the Orange Free State conducted an international workshop on the role of nonformal education and concluded that it supports formal education and must be considered an important development tool, a conclusion likewise reported by Vermaak.

Among the proponents of nonformal education are many educational revolutionaries from the developing countries who have become frustrated over the inability of the formal system to address the needs of the poor, write Ward and Herzog (1977 p. 44). Such revolutionaries, according to the authors, seek alternatives in order to bring education to people not reached by the formal system, to do so at lower costs and to make educational goals more responsive to learner needs.

Magagula (1978, abstract p. 305), realizes that the Rural Development Area Programmes in Swaziland are not meeting their intended development goals. He finds the extension education component to be extremely weak. Further study leads him to the conviction that while the RDA strategy is

considered sound, a variety of strengthening recommendations are in order. One of those is embodied in his assessment that "this study has demonstrated that both education and economic progress are major factors in transformation of farmer attitudes. Though the latter factor may, in fact, be the outcome of changed attitudes, there is no question that education is a necessary input for changing attitudes which may militate against economic change. It is thus absolutely vital that education, both formal and informal, be used as an integral part of all programmes designed to induce change in the RDA's".

The current stage of underdevelopment in Lesotho is described by Setsabi (1984 pp. 4 - 24), who calls on nonformal educators to respond to the challenges of development. He thinks nonformal educators hold a clear and fresh approach to grass-roots activities among Lesotho nationals and extolls the strengths of nonformal education in that sense. Setsabi says that nonformal education seeks community problem solving through better prepared local leadership using local resources, and that such is accomplished by building human capacity in the villages. He views development in terms of the quality of

participation of communities in solving their own problems. Further, he thinks nonformal educators can design educational experiences based on the views of the villagers with the added bonus of developing the potential of communities to help themselves. He adds that nonformal education is vital in Lesotho as a complement to the formal education system. Setsabi maintains that the nonformal education delivery system in Lesotho is relatively well developed, citing on-going activity in agriculture, community development, cooperatives, crafts, construction, literacy and health. Harbison (1973 p.5) describes nonformal education as the most "unsystematic" of all education systems but one that plays perhaps a more significant role than formal systems in changing skills, values and attitudes in developing countries.

Most educational systems in developing countries are poorly adapted to their real development needs according to Moir (undated, pp. 4, 16), who attributes that phenomenon to the transplanting of western systems into the milieu of the less developed world. He agrees that the results have been disastrous. Moir proposes what he calls a teacher-developer practitioner role for educators where pedagogic and community development skills come together

in the Third World toward the advancement of nonformal education. In such developing countries, writes Callaway (1973, p.20), most nonformal education programmes are directed at adults not reached by the formal system in the belief that work performance and productivity can be improved. He cites UNESCO's efforts in functional literacy as a purposeful strategy to link literacy with marketable skills.

Coombs (1980 pp. 10 - 11, 28 - 31) attacks traditional agricultural extension programmes in the poor countries in having produced services in benefit of the better-off members of developing societies, sometimes to the detriment of the poorer citizens. He contrasts and applauds UNESCO's policy of "life-long" education through which member states were encouraged to mount nonformal education programmes. One so-called "coping" technique recommended by Coombs, as a result of his extensive study, is "using educational processes to increase people's awareness of their inherent capacity to effect change and improvement in their own condition, even starting from bare subsistence levels". Coombs further states the education of the users of changing technologies and innovations is fundamental to sound and lasting

development, alleging that educating villagers themselves has long been neglected by most development donors. He concludes that nonformal educators have an important role in the challenge.

Some popular myths exploded by Anderson (1973, p. 27 - 31) are in his contention that it is not necessary for countries to abolish social status inequities in educational opportunity in order to progress. He suggests that no developed western nation became so due to equal opportunity in education. At the same time, he proposes that developing nations have unlimited opportunities for meaningful nonformal education programmes because such disparities persist. In new nations where governments must mount strategies for advancement in a milieu of tradition, nonformal education techniques will facilitate this transition, according to Anderson.

Simkins (1976, Table 1) in his writings on nonformal education and development, argues its appropriateness for the development task on the basis of its inherent strengths. He continues that nonformal education is short-term and specific and is non-credential based. It is short-cycle, and can be both recurrent and part-time.

Its content is output-centered and individualized, Simkins argues, and its entry requirements and practical content are determined by its clientele. He stresses that the nonformal education delivery is community-related, environment-based, learner centered and flexibly structured. Lastly, Simkins says nonformal education is self-governing and democratic. These are strong arguments for a prominent role in development strategies.

The China experience is, according to Schramm, Chu and Yu (1977 pp. 194 - 201), unique in its success at achieving vast participation in its development mode. They describe the process through which development occurs on a foundation of the least advanced peoples of the greater society. While they admit that the China approach has been closely associated with charismatic leadership, they yet attribute much of its success to the notion of people, and people alone, having been the motivating force behind the outcomes. Schramm and his associates explain the total integration of development components so that the whole becomes a psychological and functional ethic at all times. They conclude with some clear signals: "There is almost a worldwide movement to bring nonformal education to rural people, and the Chinese experience is clearly

relevant here. Any country that needs to learn the lesson can learn from China's experience the importance of the need of providing educational opportunities fitted to the needs of a community rather than to a scholastic tradition. One can learn from China the need to make development an all-out effort if it is to succeed. In China, development is not something for planners or bureaucrats or leaders only, it is for everybody".

Simkins (1976, Chapter 4) looks at three case studies to demonstrate models of grass-roots nonformal education. The village polytechnic movement in Kenya contemplates training centres operating at low cost in villages for the nonformal education of primary school leavers in skills which are locally marketable and which contribute to the development of their home areas. From one-half to two-thirds of the polytechnic graduates were finding paid work in 1976. Tanzania, under Julius Nyerere, has formulated a unique development philosophy based on the needs of the rural poor. The mass education scheme at work in Tanzania very closely resembles Simkins' paradigm model for nonformal education mentioned before. In discussing Cuba's schools in the countryside, Simkins' comments explain that country's efforts to eliminate class

differences through revolutionary education. He concludes that life-long education has played a key role in Cuba's development strategy.

A great deal of literature is reviewed by Sharma (1980, p.21) who summarizes his study of nonformal education in rural development with his own conclusion. He takes a holistic position in his statement that nonformal education develops capacities in man to relate to the economic, social and political goals of nations. In that sense, he feels nonformal education can address social, cultural and political concerns as well as economic advancement. Sharma thinks that nonformal education is an integral part of the development process and thus must form a component of programmes designed to assist rural people to bring about their own political, economic and social advancement.

Ward, Dettoni and McKinney (1973, p. 123) write extensively on designing effective learning in nonformal modes. They are especially insightful in their design, components of needs, relevance and involvement. They propose that feedback linkages can enhance flexibility. The critical issues of purpose, values and direction are

central to their planning process. They summarize that "developing new strategies for educational development has become one of the demanding social obligations of our time. Conscientious educators and planners are aware of the moral dimension of development and of the human outcomes of nonformal education which forms a significant part of the development process".

Addressing the matter of comparative education in developing societies, Stone (1981, p.81) believes that a differentiated educational system could serve to distribute learners among the sectors of the economy as determined by manpower needs. In such a scenario, instruction would respond to the economic profile of the country in question. Where this does not happen, according to Stone, there may appear a surplus of graduates in some sectors and a critical shortage of personnel in others. This can reach alarming proportions as it did in Indonesia in 1968. Presumably, the differentiated educational system Stone suggests includes a strong nonformal component.

Hilliard (1973, pp. 137 - 138) holds that people in earlier times learned most of what they learned through nonformal

education and attributes its demise to colonialism. During colonial times formal European systems became the keys to both civil service positions and status. The need for vast numbers of national civil servants after independence fueled the expansion of the formal system, assisted by foreign aid. Hilliard says that this focus contributed to the neglect of nonformal education modes and the widening gap between educated and noneducated. Meanwhile, formal education failed to cope with national manpower needs. Under such circumstances, Hilliard feels, the only opportunities for the poor majority are through nonformal education.

Nonformal education is the maverick of the education family, declares Townsend Coles (1982, pp. 5 - 16). Against a bleak backdrop of the human condition in much of Asia, Africa and South America, he urges that nonformal education must become an integral part of development, "for nonformal education is at the heart of all true national development plans and if it is not then there will be no enduring development; that is to say if the aim of all the efforts being made is not the comprehensive betterment of the human condition, whatever the economists and other wizards of the mind may concoct, the result will

suffer from lack of durability. It is only by giving to everyone the opportunity of becoming aware, sensitive, alert and skilled citizens that a country can hope to develop".

Townsend Coles adds that nonformal education is a critical component of all development schemes which are truly destined to uplift entire populations on the premise that human development is fundamental to all other kinds. And that degree of human development resides with nonformal education. As a sign of wide concurrence with his position, Townsend Coles concludes by citing supporting commentary from the governments of Kenya, Lesotho, Mauritius, Nigeria, Tanzania and Zambia.

Describing the role of education during colonial times in West Africa, Bown (1979, pp. 23 - 25) explains that independent African states early on saw education as an instrument for physical infrastructure and economic development. The focus was then on skills training and manpower supply. To be sure, adult education did make a contribution and one which could happen in a much more rapid and practical way than that attributed to school education. Since the general shift in development

thinking toward improvement of people's lives, many types of needs are the focus of integrated development approaches. Bown thinks the current challenge to adult (nonformal) education is to help people learn to produce goods and services, train them for jobs, and educate them for decision making. He adds that, in these ways, adult education can make a significant contribution to national advancement. Bown concludes with this statement: "(But) the whole point of adult education is to help people to contribute to, promote and participate in national development".

Bown and Omolewa (1979, pp. 242 - 249) write of the future of adult (nonformal) education in West Africa in some clear statements. Interestingly, they point out the need in the developing world to "keep up" with advancing science and technology and the associated need of workers to learn new ways of using their skills. They feel the western formal education system has little chance of doing that. Against that scenario they make the following declaration: "All these factors have led to a general consensus in West African countries that adult education is indispensable to economic development and to the establishment of a just and democratic society".

Upon that declaration, Bown and Omolewa admit the implementation of nonformal adult education programmes on a vast scale and within the context of lifelong learning, requires a massive commitment. In such an endeavour they stress the need for education programmes to be learner-centered not only in focus but also in planning, content and methodology. In this latter regard, they see group and discovery methods complementing individual learning in future programmes. A last interesting point in the conclusions of these authors is the prediction that, while human beings in their socio-economic setting provide the stage for today's nonformal adult education, the future will demand massive environmental education in order to conserve natural resources and prevent further destruction of the human habitat.

Townsend Coles (1977, pp. 3, 11 - 13), writing of the educational crisis in the Third World, wonders whether or not a massive nonformal education movement can be launched to meet the growing need of children not having primary education opportunity and, importantly, adults who have been wholly left out of the formal systems. He suggests that the search for alternatives might look to China where

school and work are fully integrated in the development formula. Townsend Coles thinks adult (nonformal) education can have great transforming power over the future choices in developing nations. He cites as examples of clear and purposeful statements about adult education and its role in development those of Tanzania and Nigeria.

Writing about Plan Puebla, Diaz-Cisneros (1977, pp. 89 -92) reports that nonformal education methods of promotional films, method and result demonstrations, group action and campesino theatre were all used successfully in bringing about gains in family income, improvement of family diet and creation of employment in Mexico.

2.3 SUMMARY

Nonformal education plays a central and critical role in meeting the needs of the rural poor. The trend of development from purely economic, trickle-down schemes toward more holistic, multi-dimensional approaches has been amply documented. The plight of the rural poor has been studied and found to be much more complex than a study in economics. The rural poor in the developing

world are shown to be a vast resource potentially capable of shouldering much of the burden of their own development.

A key for unlocking that potential strength is nonformal education which holds inherent characteristics that make it appropriate for the development challenge. Nonformal education is short-term, specific, and non-credential based. It can be recurrent and part time. Clientele determine the standards and content of nonformal education which is output-centered and individualized. The delivery systems for nonformal education can be community based, learner-centered, and flexibly structured, along self-governing democratic lines.

In a developing world in which most rural adults and growing numbers of youth are alienated and disenfranchised by inadequate formal education systems, nonformal education holds a last best hope for a better tomorrow. These findings satisfy, without question, the initial component of the purpose of this study.

Since agriculture is a vital component in the rural development formula, and since nonformal extension education likewise plays a central role in agricultural development, that field of activity is studied next.

CHAPTER 3 NONFORMAL (EXTENSION) EDUCATION IN AGRICULTURAL DEVELOPMENT

3.1 EXTENSION

3.1.1 History and development

It is widely accepted that "extension education" or simply "extension", is appropriate nomenclature for the practice of nonformal education in agriculture. As in the case of references to the wider practice of nonformal education in the world context, problems of description must be faced at once. Kelsey and Hearne (1949, p.1), in a classic tome on extension, define it as an out-of-school system of education in which adults and young people learn by doing, and which seeks as its fundamental objective the development of people.

The partial review of extension education literature which follows is intended to bridge the parallel schools of thought which prevail in agriculture and education in the nonformal education arena. Since this study is toward a doctorate in education and since many of its readers will not be agriculturalists, it is felt that a thorough academic review of extension education literature is justified, although discussed many times elsewhere.

Vitzthum and Florell (1976, p.8.) quote the 1914 Smith-Lever

SERIALS LIBRARIAN
VISTA UNIVERSITY
P.O. BOX 380
BLOEMFONTEIN 9300
TEL: 051-505132R

Act which provided for cooperation among USDA, the land grant university system and county governments in conducting agricultural extension in the United States. The Act specifies that the work "shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges (now universities) in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications and otherwise".

The Smith-Lever Act is again quoted by Raudabaugh (1976 pp. 123 - 125), defining extension's function in the U S in a slightly different manner: "To aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same".

He also cites a 1948 extension committee report which includes an assessment of U S extension teaching methods and concludes that "the best educational methods of Extension are those which fit the subject matter to be taught; which take into account the educational and economic situation of the people and their cultural practices; and which reach effectively the largest number".

Rogers (1983, pp. 338 -339) describes the extension system

in America, in terms of the fifty state systems cooperating with the federal extension service of the USDA, as the largest public investment in a diffusion system in the world, citing its magnitude in the United States as consistently equal to the expenditure for agriculture research. He traces the extension path of agricultural innovation as emanating from USDA and land grant university research stations and flowing through state extension specialists to county extension agents (both land grant university faculty members) and ultimately to farm families. He describes the products of the system as seeds, machinery, fertilizers and feeds. Rogers believes that innovation thus reaches American farmers by a central diffusion system but that horizontal transfer then takes place among farmers through their own peer networks.

Distinguishing features of extension in America, according to Boone (1970, pp. 266 - 275), include nonformal education which makes knowledge relevant and helps people solve problems; the use of participants in planning, delivering and evaluating educational programmes; and the linkage network with existing organizations. Other hallmarks are its impressive volunteer organization, its multilevel government support and its "bridge" effect between research and farming. Boone categorizes extension education methods as individual, group and mass media.

Among the individual methods are farm and home visits, personal letters, telephone calls, informal contacts and office visits. Group extension teaching methods center on organized meetings which provide contact between farmers and the extension educator while maximizing the cost efficiency of the instructional and organizational time of the latter. Group methods include such variations as meetings, demonstrations, field trips (tours, days), extension schools, group discussions and the multisensory farmer training center model. Mass methods embrace such strategies as poster programmes, radio broadcasting, exhibits, news columns, extension publications, films, television and the organized campaign.

Claar, Dahl and Watts (undated pp. 1-2) define extension as "a special type of problem-solving action-orientated education that instructs, demonstrates, and motivates, but does not regulate or provide non-educational programmes". They suggest that in its practical application, extension education will attain its maximum effectiveness in societies where the constraints to individual decision making are minimal. They seem to strongly adhere to the notion that if

extension is not education, then it is not extension, and tend to disfavour any type of regulatory, enforcement or political role for extension educators. According to the authors, the unique reliance by Americans on extension education "has as its philosophical base the idea that people produce, market and consume; and any successful extension system must bring about change through training and motivating the people on whom it depends for these functions".

Since extension in the United States, in the applied sense, is a function of the land grant university system and extension educators are normally faculty members of those universities; most institutions have public position statements on their extension mandate and official guiding principles for their extension faculty. At Washington State University, for example, the institution commits itself "to make readily available to all citizens the results of research and the rich cultural heritage as embodied in the arts and sciences".

Expected of WSU extension faculty members are:

1. Effectiveness in analyzing problems of individuals, groups, and communities, and in planning necessary work;
2. Ability to organize and utilize the resources of people, the university, and government agencies in carrying out programmes;
3. Ability to speak and write effectively and to communicate ideas to others;
4. Personal leadership and the ability to develop leadership in others;
5. Professional development, including work toward an advanced degree or courses in appropriate fields.

The professor, or equivalent rank, is expected to be able to represent the University with distinction (Faculty Manual, 1984, p 3, 29 - 30).

A brief history of extension education in the U S is presented by Sanders (1973, pp. 13 - 19) who explores the legal base, scope, functions and general objectives of the programme. His treatment of the educational nature and focus of extension work is particularly useful. It describes the educational process as strictly nonformal with no fixed curriculum or course of study, conferring no degrees nor diplomas and using homes, farms and public places as classrooms. Sanders describes the extension educator as one having a broad field of subject matter which is highly practical and is organized for immediate problem solving among a large heterogeneous audience. The participation of that audience in educational programmes, Sanders explains, is voluntary but the application of the subject matter to participant problem solving requires real behavioral change.

The field of extension is broad, though it tends to concentrate on agriculture and home economics, uses a variety of nonformal educational methods, and is farm family focused. Extension is likewise research linked, flexible, practical and dynamic, and can be brought to

bear on the expressed local needs of people, according to Sanders. It utilizes a vast network of local leaders and aggressively promotes the application of practical information.

Since the foregoing discussion has dealt principally with extension in the United States, it is appropriate to clarify that the U S was not the first country to implement extension education programmes, nor is it the only nation which developed a competent and effective extension movement. The history of extension in Europe is more than a century old. Sanders and Maunder (1973, p. 25) claim that the term "extension education" was coined at Cambridge University as early as 1873 to describe a unique extramural educational innovation at that time in Britian, and that travelling teachers of agriculture were to be found in several European countries even earlier*. The Cambridge model extended subject matters of that great and ancient university to people where they lived and worked, and strongly influenced similar educational movements in other British and American universities. Public funds from county councils in England were among the first grants to the extension movement historically documented.

* See comments by Professor Gwyn Jones on Ireland in INTERPAKS Interchange, Urbana: University of Illinois, March 1984.

A somewhat parallel and closely related movement led to the formation of the agricultural advisory services in Europe and Australia. Maunder (1973, pp. 1 - 3) documents the Scottish Advisory Service as among the oldest in the world and points out its county/agricultural college/national programme relationship which is not unlike the relationship that developed in America. Maunder traces the evolution of the extension movements in several advanced countries and concludes the exercise with some useful working definitions. He states that "extension, in its broad sense, may be defined as the extending of, or a service or system which extends, the educational advantages of an institution to persons unable to avail themselves of them in a formal manner". His own definition of agricultural extension is "a service or system which assists farm people, through educational procedures, in improving farming methods and techniques, increasing production, efficiency and income, bettering their levels of living, and lifting the social and educational standards of rural life".

That well organized extension education systems had progressed to impressive levels of effectiveness in Australia, Canada, New Zealand and Japan by the early 1960's is established by Sanders and Maunder (1973, pp. 26 - 27). Developing economics, policy formulation and the need for understanding of advancing technology by producers, processors and agricultural service organizations contributed to this progress in extension. Japan and the Scandinavian countries had extended their subject matter coverage beyond agriculture to home, youth and community work, much like America. Organizational forms range from those closely linked to university research and teaching as in the U S and Scotland, to those coordinated by ministries or departments of agriculture as in Australia and South Africa, to farm organization-sponsored extension in Scandinavia, to community development extension models as in India.

Kelsey and Hearne (1949, pp. 387 - 395) identify meaningful advances in extension development centres as early as 1949 in the Lebanon, Costa Rica and Jamaica; along with agricultural extension schools in the Netherlands, Peru, Uruguay, and Costa Rica; and training for extension workers in India, Pakistan,

Greece, Turkey, Philippines, Iraq, Iran, Brazil, El Salvador, Haiti and West Germany. France, Netherlands, Belgium and Switzerland all supported advanced agricultural systems by comprehensive education and extension systems by that time.

That agricultural extension education came to play an important role in the advanced and advancing countries rather early in the present century has been amply documented. Remarkably similar definitions of extension which communicate the "essence" of this unique movement have likewise been stated. Certain features of the philosophy, structure, methodology, and educator qualifications and commitment which make it so successful have been discussed. It is now appropriate that other aspects of the extension process be examined.

3.1.2 Extension dynamics

Frutchey (1973, pp. 31 - 48) looks at the learning-teaching process as a behavioural science. He describes communications dynamics, discussing the roles of the communicator and the receiver and the interactions that happen between them by means of the

messages formulated and the methods used to communicate them. He explains individual differences among learners in terms of sight, hearing, reaction time, speed of learning, attitudes of learning, skills, methods of learning, permanence of learning, heredity and environment, and the importance of likenesses. He explores the mystery of motivation by examining needs in the areas of felt and unfelt needs, determination of needs, psychological needs and the effects of frustration. Frutchey discusses perception in light of such considerations as mental activity, perceptual organization, apperceptive mass, closure, perceptual filters, image creation and decision making. Finally, he looks at learning through the conditions conducive to learning, theories of learning and the diffusion process. While many of these same dynamics are common to all education, it is important to know that extension education situations among members of farming communities offer some unique challenges.

In general agreement with the need for sensitivity in learning theory and communication skills is DiFranco (1973, pp. 58 - 61) who sees teaching as an art as well as the central task of extension educators. DiFranco warns against being satisfied with problem

identification, organizational work, meetings and attendance counts. Unless the art of teaching is mastered in the extension process, little effective learning will be achieved. He lists as prerequisites for extension educators a sincerity of commitment, an understanding of rural people, a belief in education, a respect for farmers, a knowledge of teaching methods, and a command of subject matter. DiFranco suggests that extension educators actually "tamper" with peoples lives; and must understand their role as one of interfering, as beneficial, and as a responsibility. Turning to the learning process, DiFranco describes it as noticing something, wanting something, doing something, and getting something. Translating those steps into education language; he calls them awareness, need, action and satisfaction. The author points to the special effort which must be made by extension educators with respect to the dynamics of the teaching-learning process; since extension participants are voluntary and are also permanent inhabitants of the educational domain. DiFranco calls on extension educators to master the dual art of preparing learners and presenting subject matter effectively.

Maunder (1973, pp. 62 - 70) likewise explores the communication process in extension in a manner similar to Frutchey's discussion. He stresses the ability to communicate as vital to the success of individual extension educators. He describes the teaching situation and graphically demonstrates how the educator sends a message through channels to a receiver. Within the context of the message are such considerations as purpose, content and treatment. Likewise the channels take on methodological emphases such as the visual, the spoken, and the written. But what Maunder does, that DiFranco does not do, is to make the learner an active partner in the process. Maunder insists that the receiver (learner) becomes the sender of his own messages through channels to a receiver who was the former sender. This process is termed feedback and is necessary, according to the author, for effective extension work. Maunder further defines learning in the extension context as that kind of activity which changes previous knowledge, results in a practice change, or changes an attitude about something; and describes the steps of the learning (adoption) process as awareness, interest, evaluation, trial and use. The author explores aspects of motivation dynamics and of the diffusion process which, while operative in

extension education, are beyond the scope of this study.

For reference, it is valuable to know that Kelsey and Hearne (1949) write profusely about the Cooperative Extension education system in America and describe its organization, financing, educator qualifications and linkage systems with government and other organizations. They examine objectives and philosophy in extension and programme development, implementation, leadership and evaluation. Like Boone, these authors stress the importance of selection of appropriate extension methods; describing in turn the press, radio, letters, photography, publications, demonstrations, visual aids, group methods, and personal contacts. Many of these principles are used in the transfer of extension to the world of development agriculture.

Visual aids in extension education is the special topic of Patterson (1973, pp. 49 - 58) who thinks the visual approach is important to learning-teaching communication since sight and hearing are the most critical learning senses. He suggests that 85 percent of learning takes place through sight alone. Patterson thinks it logical that extension educators make optimum

use of the visual medium. The author stresses that visual aids in extension are only aids and must be amply complemented by good teaching skills and accurate subject matter. Patterson lists some visual aids such as photographs, transparencies, posters, specimens, models, and symbols; and says that good visual aids should be suitable, simple, accurate, attractive and purposeful. He concludes with a more technical discussion of the development of appropriate visual aids of the several types named.

Writing also in 1973 (pp. 67 - 84), Jones faces the sociological implications in extension. Since man is a social being, according to Jones, he depends on social interactions for much of his development. Man is concerned about his own behaviour and the behaviour of others. During his life and growth, man becomes part of various social systems. He is a member of his family; but also of his community, his state, and his nation. He may also be a member of his clubs, his interest groups, his church or his school. The prevailing influences of such social systems and sub-systems all have their impact on the behaviour of the individual member. Sometimes these influences are in conflict. Jones discusses social action and group

action and vividly describes different forms of social action such as competition, cooperation, consensus, assimilation and diffusion. All of these may have profound effects on extension education programmes, he explains, and seeks to demonstrate how extension educators can use these various responses for positive results. Jones explores examples of social behaviour conditioned by such forces as the family, the educational system, economic incentive, government policy, the church, and recreational habits. He explains the interrelationships of social institutions, showing how some are helpful and others harmful to extension work, and concludes by predicting increasing complexity in extension education, conditioned partly by changing social influences.

Maunder (1973, pp. 81 - 92) agrees with Jones, pointing out that an understanding of social and cultural factors is critical to good extension education. He adds that the civic structure can work for or against effective programming depending on how well it is understood and taken into account during programme planning and implementation. Maunder also stresses the need to recognize and shape local leadership in order to insure their legitimization of and participation in extension programmes.

While extension work takes place through organizational structures most appropriate to respective countries and governments, Clark (1973, pp. 88 - 94) presents models which are operative in America. This information constitutes a useful reference for organizational and administrative considerations. A valuable source of practical information about actual programme planning and development is provided by Pesson (1973, pp. 106 - 115). Pesson defines and describes the programming process. He includes in his extension programme development model the collection of facts, situation analysis, problem identification, objective setting, writing of plan of work, programme implementation, evaluation, and modification. These actions are both sequential and circular. Pesson walks his readers through this process providing useful hints and tips to aid extension educators in their own programme planning and action experiences. He points out the importance of using advisory groups in programme planning in order to allow maximum participation of clients in the educational process. Pesson also explores the realm of education and change. He pursues the dynamics of the relationship through the stages of developing a need for change, establishing a change relationship, moving toward change, stabilizing change, and establishing a

terminal relationship. So far as effecting change itself is concerned, Pesson chooses another set of identifiable steps to include initiation, legitimation, diffusion, organizing and planning for action, conducting programmes and evaluation.

The use of lay leadership in extension education programming is important, Trent (1973, pp. 123 - 136) suggests. Under the best of circumstances, extension educators are too few, and the added thrust that can be given to extension by interested, active and coordinated participation by lay and volunteer leaders is much too important to ignore. Trent says that lay leaders fall into the two broad categories of action leaders and opinion leaders, and that both perform vital roles in extension programmes. They may be subdivided, according to Trent, as organizational leaders, subject matter leaders, activity leaders and programme advisors. He further explores ideas about the identification, selection, recruitment, motivation, training and evaluation of lay leadership.

Rose and Tapson (1984, pp 172 - 174) trace extension as an agricultural movement in South Africa back to 1924 when legislation was passed creating the division of

agricultural extension within the Department of Agriculture. The RSA now operates seven extension regions and thirty three sub-regions, according to the authors, with competent extension personnel deployed as required. Until 1955, extension in the Black states centered largely on soil conservation and erosion control. The focus shifted after the new 1955 policy consensus toward agricultural stabilization, reclamation and rehabilitation. Several of the Black states now operate their own departments of agriculture and are setting their own priorities for agricultural extension. Special problems in the Black areas require a unique approach to agricultural education, research and extension, according to Rose and Tapson.

3.1.3 Concluding comments

The foregoing commentary seeks to define extension as that form of nonformal education which evolved, developed and is widely practiced in agriculture. It also documents the history, evolution and general focus of various extension education systems as they operate in several of the advanced countries of the world. The United Kingdom is seen to be the cradle of extension, which has its roots in Cambridge University,

and is also the site of one of the oldest agricultural advisory services which links teaching, research and extension in agriculture. That is the Scottish Advisory Service.

Much of the discussion has its base in the literature about the Cooperative Extension Service in the United States, for a number of reasons. The American extension education system is the largest system financed by public funds, has contributed directly to the development of one of the world's most advanced agricultural sectors, and is renowned for its success among a rural clientele. Thus, it is in the United States where more extension educators are active practitioners and where more scholarship is being conceptualized for wider application in the world.

In order to fully understand the dynamics of a successful and viable extension system, many operational principles and programme aspects are explored. Among these are appropriate legislation and government commitment, educational objectives in agriculture, extension methods, organizational constructs, scope, the learning - teaching process, communications, and motivation. Other areas which are

discussed are the role of visual aids in extension, the sociology of extension education, the programme development process, client participation in programme guidance, and the role of lay leadership.

References are also made to the unique extension experiences of the Netherlands, Australia, Canada, New Zealand, Japan, France, Germany, Belgium, Switzerland, the Scandinavian countries and South Africa.

It is reasonable to believe that this system of extension education which has helped generate such phenomenal agricultural advancement in the countries mentioned, should then have widespread application in addressing the problems of agriculture in the developing world*. That this has not been an easy transition is well known, and the experience over the past decades has produced many models and even more challenges which have become part of extension literature. The significance of that experience follows.

*Models which worked well in Taiwan and Israel are notable.

3.2 EXTENSION IN AGRICULTURAL DEVELOPMENT

Departing from the notion that educational principles involved in helping people help themselves through government supported extension education can be used to transfer technology and get it adopted, agriculturalists and extension practitioners in advanced countries have laboured for nearly four decades to raise agricultural productivity and the quality of rural life in the developing world. In so doing, they have drawn on models, concepts, and expertise from experiences in the advanced nations in the hope that similar responses might be brought about in the Third World countries. The responses, despite some isolated successes, have not been terribly impressive. But, the experience has been a valuable learning arena for development programmers and practitioners in the community of donor nations. In 1985, based on lessons learned through repeated failure and against a backdrop of the alarming conditions of developing agriculture, new expertise, promising concepts, and a fresh commitment can be seen in the development realm. Certainly in agriculture, there is great urgency while at the same time there is realization that systems require support, balance, hard work, and much patience.

Extension has survived the battle so far, and somewhat scraped and bruised, has found new credibility in the context of multidisciplinary strategies facing the challenges of building complex national systems of policy, supply, credit teaching, research, extension, services and markets in agriculture.

Writing in 1973, (Sanders and Maunder pp. 25 - 30) question the role extension might play in developing countries and wonder whether it is capable of the flexibility and adaptability required in countries which face problems nearly forgotten by the advanced nations. They see the constraints of Third World cultures and public service philosophies as components of an extension education which must respond to the human conditions of despair, apathy and hopelessness. The affordability of extension systems in countries where public funds and other resources are in short supply worries them. They recognize that developing nations are faced with simultaneously building administrative structures, developing local economies, and satisfying needs and expectations of the people. They conclude that extension and other forms of nonformal education are vital to this process. Sanders and Maunder understand that extension in the developing countries may be the cooperative type associated with university teaching and research, the ministry or department-directed type, or the broader community development kind. They don't think it matters so long as the extension education is nonformal, problem-focused, satisfying to participants, improving of

rural life, agriculture-centered at the outset, and contributory to the self-help philosophy.

Despite the challenges posed, Sanders and Maunder believe in the basic concepts, principles and methods of the American extension model and urge that it become sufficiently flexible and adaptable to share, even more than it already has, in the challenge of world agriculture. They add that extension for agricultural development must remain essentially educational, responsive to need, cooperative in nature, and people-oriented. Beyond those characteristics, they hold that effective extension must depend on constant access to appropriate subject matter and must opt for methods respectful of local cultures. They insist that training and support for national extension cadres must happen if extension is to become an effective development tool for agriculture. As examples that all this can and does happen, they cite examples of international accomplishments executed through a variety of relationships among such organizations as USDA, the land grant universities, USAID and FAO.

York (1973, p. 147) supports Sanders and Maunder's general position on extension by his submission that the development of effective extension education programmes may be the most critical need in accomplishing the application of improved

practices by farmers. In that way, York feels, extension can make a significant contribution to agriculture in the emerging nations. He sees improvement in the productivity of agriculture as fundamental to growth in other sectors of local economies. Concluding, York calls for greater cooperation in sharing extension expertise with poor countries.

The Cooperative Extension Service model is adaptable for agriculture in developing countries, propose Claar, Dahl and Watts (undated) pp. 9 - 13), if flexibility is exercised and rigidity avoided. They hold that the commitment of substantial resources by government is a requirement for any developing country that expects its extension education system to make a difference. National extension staffs must include men and women who are well trained, well supported and rewarded in their work, according to the authors; who also feel that extension demonstration techniques in cooperation with representative, organized farmer groups have a high chance of lasting effects. Claar, Dahl and Watts prescribe such conditions as a national infrastructure, an adequate knowledge base, involvement of participants, public financing, freedom from all but educational duties, attractive working conditions for

extension educators, good interagency linkage, and the deployment of extension personnel among farm communities as essential to an optimally effective extension system. They hasten to clarify their understanding that if all these conditions are present in a target country, then the country is probably not underdeveloped! Given that admission, the authors seem to reconsider their conditions and name the components they feel are essential to an effective extension service. Among these are a clear mission including finance and evaluative aspects, a client-centered approach to education, avoidance of non-educational tasks, a problem-centered knowledge or research base, a selective cadre of extension personnel, accessibility of staff to clientele, involvement of local leaders, access of clients to extension supervision and an effective mix of extension methods. Though the authors again allow for some adaptability to national characteristics, this second list of considerations appears to not differ significantly from the first, and developing countries with these components in place must be few.

Selected U S methodology with special application in international work is subsequently dealt with in the writings of Claar, Dahl and Watts ((undated) pp. 13 -21).

More realism seems to prevail in this discussion as the authors proclaim that "the techniques of group instruction, on-site demonstration and follow-up coaching visits are as old as extension itself. And they have proven to be effective approaches for technology transfer and motivation to change when supported by effective use of mass media to create awareness and provide recognition and supplemental instruction".

But, the authors deal very effectively with several factors which influence extension in developing countries. Extension must help farmers do the best job possible within the context of existing opportunities. In areas where agricultural infrastructure is weak, a good deal of cooperation and linkages must be pursued in such areas as inputs, credits and markets. Where agricultural research is not strong, appropriate information must be borrowed from countries which have dealt with like problems under similar conditions. Agricultural extension programmes in developing areas address production and home utilization as well as marketing. Thus, education must look at food preservation and post harvest storage as well as production and marketing topics. Extension educators in poor countries must consider the complexity of the learning process and seek appropriate

methodology mixes, and they must be especially sensitive to family and cultural values. While western agricultural economists persist in defining farmer behaviour in economic language, these authors caution that developing farmers seek low cost techniques which will assure subsistence, but are reluctant to risk expenditures on innovations even when greater incomes are highly likely. They claim that "in general, low capital accumulation, lack of production inputs, low current earnings, cultural factors, old age, previous bad experiences in farming (such as drought) and inadequate markets all tend to reduce the importance of profit in decision making and increase the importance of other factors. In those cases, efforts to transmit technology that involve high cost outlays and risks may encounter serious problems".

Farmer experience with low quality or undependable inputs can seriously hinder extension progress. Low literacy among farmers may inhibit effective extension through western methodology. Extension educators must seek methods which are compatible with the learning patterns or learning potential of their clientele. Radio has had many successful applications in Third World countries, especially when used with some sort of supplemental instruction; but

there are also instances of notable failure of radio extension. Demonstrations, both method and result types, are generally useful and are recommended in the emerging nations, but again they must be organized with all the sensitivity necessary to insure mutual respect between educator and farmer. A degree of learner participation in demonstrations is usually desirable. Despite the fact that mass media, such as radio, have severe limitations in terms of in-depth instruction and credibility, they do retain strength with respect to reaching large numbers of people and creating awareness of extension programmes. Claar, Dahl and Watt conclude that "developing a more effective extension system is a common quest in many countries, especially those that need to greatly expand production and utilization of food*. Many existing systems have been recognized as very inadequate, especially in developing countries. A major goal in any such countries is to improve the production and utilization of food through a more effective extension service. Consequently, this will also be the focus of a great many assistance programmes of the future".

*Important contributions to extension thought for the African setting have been made by Chambers, Leonard, Röling, Lilley and others.

In drawing up a major policy statement on the international mission of the Cooperative Extension Service, Greenwood* (1984, pp. 4 - 8) alludes to the experienced cadre of American extension personnel in her comments on Extension's concern for basic world problems and the challenge to support U S government effort in international development. She understands the struggle that USAID and BIFAD** face in their efforts to deploy effective extension personnel and methodologies and feels that U S extension educators must face the challenge of assisting their government and others in this aim. Greenwood supports her policy statement with reference to Title XII of the International Development and Food Assistance Act of 1975 which gives a mandate to the American land grant universities to assist in, among other things, "the planning, initiation, and development of extension services through which information concerning agriculture and other subjects will be made available to farmers and farm families ... by means of education and demonstration".

* Mary Nell Greenwood is Administrator of the Federal Extension Service, U S Department of Agriculture.

** BIFAD is the (U S) Board for International Food and Agricultural Development.

She also cites Title XIV of the 1982 Farm Bill which gives the American Secretary of Agriculture the authority to "assist the Agency for International Development with food, agricultural research and extension programmes in developing countries, and assist U S colleges and universities in strengthening their capabilities for food, agricultural, and related research and extension relevant to agricultural development activities in other countries". Greenwood summarizes Extension's policy commitment to international agricultural development with this statement reflecting mission, "The U S Extension System can support AID and the US Department of Agriculture (USDA) with an organization possessing a farmer-oriented philosophy and experience in technology diffusion which can be adapted to the varied situations and cultures found throughout the world. It is the one organization designed for, experienced in, and able to bring the mystery of research within the reach of the practicing farmer. Its greatest relevance may be in its historic concern for what happens to the farm family as a human unit with real life problems".

In function then, Extension's mission, tempered by modifications appropriate to the unique needs of developing

countries, is relevant in the diffusion of knowledge and in its practical application.

Writing on agricultural development from an international perspective, Hayami and Ruttan (1971, pp. 274 - 275) declare extension education for farmers a vital component of infrastructure development. They state that the provision of education for producers and agricultural information dissemination are priority items for agricultural development. They express concerns about factors inhibiting peasant farmer responses to economic incentives and write of extension programmes which have focused on changing attitudes, promoting technical advancement, and allocation of available resources. Hayami and Ruttan firmly believe that extension can overcome the shortcomings of inadequate education where technology is advancing and available to farmers.

There are many problems which face developing countries as they organize national extension systems and attempt to field appropriate extension education schemes. These problems are sometimes viewed from a different perspective by national extension directors in Third World countries as compared to the assumptions drawn by extension practitioners

in the advanced nations. Sigman and Swanson studied this relationship and published their results in 1984 (pp. 1 - 13). Sigman and Swanson recognize the principal constraints to the effectiveness of agricultural extension systems and list them as technology, linkage, technical training, extension training, mobility, equipment, teaching aids, organization, and other problems. They surveyed extension directors in 129 countries and collected fifty-nine acceptable questionnaires (forty-six percent response) on which respondents rated the above constraints on a three-point Likert scale. The researchers' study concludes that lack of mobility, extension training, communication and teaching equipment, and organizational problems are the most serious constraints to effective extension. Technology and linkage problems are not viewed as serious by national extension directors. Technical training is seen as somewhat of a problem worldwide but is not seen as such by African directors. Since development literature often mentions lack of relevant technology and linkage problems as serious constraints to extension, it is interesting to note that national extension directors do not share that perception. In summary, Sigman and Swanson place a high priority on meeting the basic needs of the poor through agricultural extension programmes.

Many authors have identified and studied problems in the execution of extension education programmes in the developing world. Townsend Coles (1982, p. 13) is among them. He identifies agricultural extension as the numerically strongest of nonformal education programmes but charges that it is generally failing to raise agricultural productivity among its clients. Townsend Coles believes that the extension workers in some countries do not really cultivate meaningful and sustained contact with poor farmers but rather prefer to work among a few responsive and progressive producers. He allows that the intent may be that poorer farmers might learn from the work of the better-endowed, but thinks that is remote since the poor have to meet more and varied basic needs before they can become agriculturally more productive.

Kumar (1979, pp. 209 - 212) says that low agricultural productivity has among its causes institutional, technological and social factors. The way out of this maze, he feels, is extension education. Extension can enable people to improve quality of life through aided self-help. Extension may focus on agriculture; but it can also address such concerns as home economics, veterinary science or

nutrition. Kumar points out that extension educators work with rural people in search of solutions to needs and wants through a process of understanding, acceptance and implementation. He believes that extension can develop individuals, leaders and the greater society through a sustained effort. It involves a two-way communications process in the application by people themselves of science and technology to problem solving in a voluntary and cooperative mode. Agricultural extension is fundamental to integrated rural development, according to Kumar, since agricultural productivity provides the foundation of development on other fronts. In the agricultural extension process, the educator must instruct, not only on the technical aspects of production, but also about credit, inputs, and marketing.

Extension problems are studied by Mosher (1957, p. 3) in Latin America agriculture. He identifies three general areas of programme difficulty. The first of these is the cultural milieu which demands that extension educators understand and develop appropriate methodologies for the people among whom they work. Second, Mosher believes that successful extension consistently outruns research. This belief is contrary to frequent assertions that the reverse

is the case. The third potential for programme difficulty is to spread extension programmes too thinly over too much territory or too many people. Again, some would argue that excessive concentration is the source of grief. Balance and moderation would seem to obtain in optimum programme conditions.

Smithells (undated, pp. 198 - 202) studies agricultural extension work among rural women in selected developing countries and finds that Third World governments realize the critical role of women in agriculture and the inadequacy of extension efforts among women. It is felt that women extension agents, supervisors and administrators are required for successful extension programmes in developing countries but that the necessary training of such personnel is constrained by the lack of appropriate educational institutions and models in European countries. Smithell identifies the Agricultural Advisory Service of Ireland as a suitable working model for this purpose and its training institution as valuable in educating such Third World women as farm home managers and poultry advisors.

Writing about increasing food production in Africa and the role of technology transfer in that context, Eicher (1984,

pp. 6, 25) shares his view that no further expansion of cultivable area in Africa will be possible beyond the year 2000. Thus, the focus of future extension programmes must be on yield improvement technology. Eicher sees emphasis on science-based intensification of agriculture as an urgent but long range goal for the African continent. He concludes that, "the lead time for restructuring and strengthening of agrarian institutions such as credit, extension and research services must be counted in decades rather than years".

Laker (1981, pp. 64 - 79) says that for agricultural development to be successful, it must not only be ecologically and technologically sound, but also be socio-economically appropriate, politically acceptable, and realistic. Many projects fail, Laker thinks, because they reduce to nonviable activities for small farmers. His principle components to realistic agricultural development include natural resource surveys, packaged technology sequences, credit, inputs, farmer education and the "establishment of an efficient extension service, backed up by a strong corps of subject-matter specialists in various fields of agriculture. Without the latter the former has no chance of achieving real success". Laker cites his work in the developing states of Southern Africa and shares his

small farmer strategies which are adapted forms of his agricultural development components which importantly require "an efficient extension service, backed up by subject-matter specialists to provide high quality agrotechnological advice". The training and deployment of such extension personnel is of priority for developing states, according to Laker.

The director-general of FAO, remarking on the issues facing the consultive group on international agricultural research (CGIAR), urges that the group strive toward cost-effective activities which are concrete and pragmatic. He charges national research programmes to become aimed at practical applications linked to extension education, development programmes, and agricultural services (Saouma, 1984, p. 3).

An important conference on knowledge transfer in developing countries held in Steamboat Springs, Colorado in 1983, has produced a great deal of contemporary thinking and some important papers on extension in agricultural development. The status of extension in that great field of endeavour is examined as well as many of the constraints to, and the outlook for, effective extension in developing countries.

Watts and Claar (1983, pp. 3 - 13), examine extension models

which have worked well in such countries as England, France, China and the United States, asking critical questions why these models have not been successfully transferable to the developing countries. With regard to the American model, they find that most Third World countries find their teaching universities under ministries of education while agricultural research and extension answer to ministries of agriculture. They also note that the latter two entities are oftentimes not coordinated nor cooperative, and that extension frequently suffers the effects of compartmentalization, unattractive professional incentives and logistical non-support. For these reasons, the land-grant model has not been adopted in the Third World and the expectations of the land grant model are not realistic in most cases. This has caused some failures due to unrealistic expectations, according to the authors.

Watts and Claar are convinced that extension is a necessary component to agricultural development and can work. They warn against being slaves to inappropriate systems and argue the importance of appealing to farmers' pride, perceptions of their environments and their peculiar satisfactions. They feel that "our job in extension, then, is not only to disseminate research, but also to make it appealing, attractive, and above all, beneficial to the individual

families working on the farms of Africa, Asia, Latin America, and the Middle East".

Committed, skilled, sensitive extension workers can successfully demonstrate improved and appropriate technology and persuade farmers to adopt more productive practices, according to Watts and Claar. They cite a number of experiences in the Third World and describe how horizontal networking, supported by mass media, has been so successful in China. They think the match between systems and needs in the emerging world is generally poor and call for bold, new approaches which are being witnessed in such concepts as the training and visit system of extension and farming systems research. They call for a recognition on the parts of both donor and emerging nations that extension is neither incidental nor an add-on to programmes to raise agricultural productivity, but rather a highly sophisticated professional field which operates on principles vital to development itself.

Writing on the role and contribution of agricultural extension in agricultural development, Swanson (1983, pp. 15 - 20) suggests that government commitment to the task varies among nations. A broad-based equitable agricultural development requires an extension focus on technologies

relevant to needs of farmers on all economic levels. Such a programme will ultimately maximize the use of human resources as are found in developing nations and, in the process, improve their quality of life. Swanson urges balance in programmes and thinks extension can work toward increasing farm productivity and broad-based agricultural development at the same time. He stresses that extension goals and national agricultural development goals should coincide for maximum effectiveness. Swanson feels strongly that "agricultural extension, then, is an organized, nonformal educational activity usually supported or operated by government, to improve the productivity and welfare of rural people who engage in all types of agricultural production ...". He finds extension farmer-focused, problem-solving, and developmental, and is convinced that it plays a central role in agricultural advancement.

Nobe (1983, pp. 28 - 29), thinks there is vast opportunity and promise for extension, especially in the realm of interdisciplinary strategies for agricultural development. Another area for valuable extension input, he submits, is in continuing education programmes for agricultural professionals in developing countries. A third developmental area requiring extension expertise is the strengthening of agricultural universities in the Third

World. Nobe thinks the current AID-land grant university relationship taps a valuable resource reservoir for technical assistance in agricultural development, with a high extension involvement in an interdisciplinary context.

Constraints to developing effective extension programmes are many. Kellogg (1983, pp. 32 - 34) organizes them into two general categories. First are those external to the extension system. Kellogg lists national policy constraints, technical content linkage constraints, and human capital level constraints as exemplary of this general category. He calls his second constraint category those internal to the extension system. There are more of these including ill-defined goals and objectives, unclear operational strategies, nonintegrated extension activities, poor communications between extension workers and clients, and unrealistic expectations of extension by farmers. Others are poor extension feedback mechanisms, lack of mobility and extension teaching materials, meager reward systems for extension educators, deficient training and inappropriate extension methodologies. Against this somewhat dismal backdrop, Malone (1983, pp. 35 - 37) thinks the management of human resources is a most vital component in successful extension services in international development work. She states that the most successful of

international extension programmes are those with viable strategies for managing the people in the system and organizing them for effective delivery and networking. Providing information and introducing innovation are not enough, according to Malone. It will not do to ignore the influences of the social system on adoption potentials.

Richardson (1983, p. 40) has a very definite perception of knowledge transfer in less developed countries. He thinks that "what is needed in an LDC is an active extension service ... transfer agents and subject matter specialists out working on the farms with farmers in daily or weekly contact with the farmers, showing and helping. Extension workers should actively work with the farmer to (1) identify his problems, (2) search out solutions, and (3) help him implement solutions. What is needed in the typical MOA are field teams, each serving 5000 to 10000 acres and made up of general purpose agronomists, sociologists, economists, and agriculture (irrigation and farm machinery) engineers. The team should have access to subject-matter specialists ... such as entomologists and soil scientists ... who serve a larger land area".

The promotion of inappropriate technology, inadequate training of field staff, and unrealistic deployment of field

staff prevent maximum effectiveness of agricultural programmes based only on technology and transfer, says Brown (1983, pp. 42 - 44). He calls for committed field extension workers, but stresses even more the need for highly trained, field-oriented extension specialists located in the field, who can support extension workers with subject matter expertise and provide linkages between farming communities and researchers. Brown favours implementation of appropriate technology at the field level over current emphasis on institution building.

Much has been written and reviewed thus far about the problems which plague the implementation of western extension models and systems in the developing world. To be sure, there have been many failures, and the lack of progress has been frustrating. There are those writers, practitioners and researchers who dwell on those frustrations and write about failure, and there are others who view failure as well as success as a continuous learning experience. They are the writers and practitioners responsible for such breakthroughs as the training and visit system of extension and farming systems research and extension. They are also those few who have gone about the business in a quiet, sensitive and persuasive way and have survived to share their successful experiences with the profession.

Mosher (1971, pp. 12 - 26) says that behavioural change through extension is not something that happens only among farm operators. In cases of credible, sustained agricultural development, significant behavioural change also happens among agricultural suppliers, agricultural bankers, and the buyers of agricultural commodities. In his development formulae, Mosher encourages agricultural education and extension in schools, colleges, and in the nonformal setting so that policy makers and managers of the support system, along with farmers, may understand the nature of agricultural change. He thinks this happens at home or overseas largely through a public administrative framework sensitive to agriculture. Mosher points out that behavioural change among farmers takes place because of a variety of influences, including but not limited to extension; and that extension must do what it does best. Needs that lie outside the capabilities of extension can yet be influenced and stimulated through persuasive extension work.

Referring to the contour-plowed, irrigated, productive Coimbatore region of India, Deutsch (1971, p. 40) compares its prosperity to the surrounding region. He attributes

this prosperity to a massive extension, training and agri-support input. Brown (1983, p. 42) mentions the immense success of the animal traction experiment station and demonstration school conducted for small farmer groups by the Central Mennonite Mission in Santa Cruz, Bolivia. This success is due to programmes sensitive to small farmers' technology and resource levels, according to Brown. For the same reasons he cites the success of a pig farm and extension school in South Korea managed by a Canadian Presbyterian church. Sastravaha (1982, p. 32) describes nonformal training for farmers in Asia and cites successful extension practical farming classes in the Philippines, farmers' clubs in Thailand and rural discussion groups in Taiwan as examples. Paik (1973, p. 177) applauds the farmer training centers of Korea's office of rural development and claims that farmers attending specific training learn to use pesticides properly, acquire skill in using and repairing farm machinery, and seek opportunity in home industries.

Mboubi (1982, pp. 16 - 33) reports rather unique extension dynamics from the Congo. Popular presentation of agriculture seems more of a sense of duty than a programme and is thus not easy to evaluate; however, rural radio in the Congo broadcasts agricultural programmes in French, Lingala and Kikongo and has done so since 1976. There are radio clubs organized among farmer organizations and supplementary instruction is given by primary school teachers. Congo officials depart from the premise that

development changes farmers' lives and innovation brings development; thus they must be prepared for innovation. Such preparation takes the form of training in crop production and livestock raising methods. Mboubi says every Congolese farmer will be responsible for feeding himself and fifteen others by the end of the century. In the Congolese context farmer training is group-centered, rather than individually oriented, and integrated rural development is the goal. Mboubi pronounces that "the human element constitutes a unique importance in the evolution and progress of agriculture, there is no doubt that educational and agricultural training are essential factors of rural development and that, if they are well adapted to their conditions and local needs, they participate in the whole process of development". He summarizes that rapid change is a reality of the times and that agricultural workers cannot count on their formal education to sustain them in their careers. Thus, he calls for a cost effective continuing education programme for Congolese agriculturists.

Extension successes have been documented by several other authors. Rahim (1977, p. 65) judges the effectiveness of extension by diffusion and adoption assessment, and claims that few people at the site of Bangladesh's Comilla Project

practiced improved rice cultivation in 1960, but that innovations were practiced on eighty percent of the rice land by 1968. Gebragziabher (1977, pp. 76 - 79) reviews Ethiopia's CADU project where agricultural extension was programmed around a network of thirty extension offices with the mandate of extending the outcomes of the experimentation department. Strategies used were information campaigns, model farms, and demonstrations. Dramatic adoption rates for agricultural innovations are reported, packaged programmes are determined to have been practical, large numbers of farmers are seen to have increased production by 50 - 100 percent, and lasting bases for sustained development seem to have been established. Nesman (1977, 121 - 125) reporting on Guatemala's basic village education project, explains that increased production in agriculture is the objective of experiments in the use of communication and extension techniques in various combinations. Radio is seen to be a powerful medium which can be augmented by effective monitors, listening groups, agronomists and demonstrations.

Education in agriculture is discussed by Ntiri, McLachlan and Pigozzi (1980 pp. 1 - 11) who point up the latter as a vital activity for all humankind and in which fully half of

the world's populations are engaged. They mention the strong role of women in agriculture and the need to address this reality in programmes. Environmental concerns challenge innovative farming methods to be cognizant and responsive to potential effects on the resource base, according to the authors. Extension education is challenged to field fresh, new pilot projects which merge the rich expertise of nonformal education with the needs of world agriculture. Characteristic of such endeavours are Guatemala's basic village education project, Mexico's Puebla project, Thai women's income raising activities, peasant training in Peru, village rural development in Togo and Bangladesh, rice cooperatives in Bolivia, women's co-ops in the Gambia, and peasant mobilization in Guinea Bissau.

Other activities cited include agricultural education for girls in Chile, rural radio agricultural education in Mexico, extension for women in Sri Lanka, agricultural training for women in Pakistan, agricultural training in rural schools of Belize, and rural development action programmes in Senegal.

In describing extension experiences and current methodologies in Africa, Pickering (1984, pp. 4 - 13)

outlines the commodity focused approach to extension, the community development strategy, the technical innovation centered approach to extension, the animation rurale method, and World Bank's famous training and visit (T & V) system of extension. Pickering concludes that for extension to work effectively it must be supported by a sound agricultural policy, of sustainable cost and technology, well organized and planned, and open to combinations of approaches.

Elaborating on the T & V system, founding philosopher Benor (1984, pp. 1 - 2) enumerates research, inputs, credit, extension and marketing as the five components most vital to agricultural development. Benor calls for close linkage between research and extension and free flow of information to and from farmers, but laments the lack of good linkages in most developing countries. T & V insures that extension workers receive frequent training by subject matter specialists and thus become qualified to teach farmers with sustained reinforcement and information flow. Benor is a modest proponent of his brainchild, which has become a cornerstone of World Bank programmes everywhere, and suggests that it is but one of many approaches which might work. The measure of success, he submits, is the results in

the farmer's field. Closing the gap between research and extension is a worthwhile task, according to Benor, but the gap between extension expertise and practice also must be closed and this can be done through sound extension systems, emphasizing the central role of extension in agricultural development.

Rogers (1984, pp. 5 - 6) tackles the problem of cost and affordability of extension services in developing countries head on. He thinks the times are challenging for extension and that the breakthroughs of T & V system and farming systems research/extension are significant. With tight budgets, many countries look for low cost alternatives to large national extension systems. Rogers applauds their efforts; however his years of research bear out that the real successes of extension are to be found in those systems which have capable agents using farmer-centred methods and teaching credible information. Mass media, he says, can be a useful tool in effective extension. To be successful, according to Rogers, extension must be mobile, persuasive, and provide a point of contact among research, extension, and farmers. When extension can do these things, he seems to say, the cost will be incidental.

In his classic work on behavioural change in agriculture. Leagans (1971, pp. 101 - 109) suggests that as greater complexity is required in technology utilization, the educational input requirement increases. New technology must be used by farmers in order to have meaning, and this will not happen without effective extension education. Three conditions must underline meaningful agricultural modernization, Leagans says. These are a favourable macro-environment, a relevant body of technology, and an effective extension system. He believes that change can happen in what people know, what people can do, what people feel, what people think they ought to do, and what they actually do. Beyond teaching facts and achieving adoption, extension must seek to change outlooks on agriculture and way of life. Leagans says, "Extension education can be the primary process through which farmers can learn the reasons for change, the value of change, results that can be achieved, the process through which change is achieved, and uncertainties inherent in change. (Hence), the importance of understanding the role of an extension system; developing and utilizing it at optimum levels of potential may no longer be viewed realistically as optional among the requirements for agricultural modernization in low production areas of the world".

Leagans (1979, pp. 3 - 4, 44 - 45) writes that at least a billion small farmers in the world do not have access to the benefits of modern agricultural technology. Those farmers do not achieve acceptable levels of productivity nor does the technology achieve its optimum level of utility. Leagans questions why the "Green Revolution" has not achieved its anticipated results worldwide, admitting that the answers are complex. He calls for modification and expansion in adoption process theory and practice since the variables involved are so complex. He thinks optimum adoption is achieved only where farmers find innovations technically sound, economically feasible, physically possible, and socio-politically sound. Leagans identifies incentives and disincentives to adoption of innovations, and attributes variability in adoption to the cumulative valence of incentives and disincentives in any given set of circumstances.

The monumental task of field extension in the developing world, after all has been said and argued, rests with extension workers themselves. A persistent controversy in this realm lies in the argument over the relative merits of extension generalists and extension specialists.

Experiences in Honduras and El Salvador have given the edge to the generalists, says Rucks (1980, pp. 81 - 85). Benor (1984, pp. 1 - 2) would argue strongly for roles for both, with specialists providing periodic training and backstopping for front line generalists. Whether generalists or specialists, Youmans (1979, pp. 26 - 28) submits, the successful international extension educator must be committed, knowledgeable, sensitive and competent; and must be capable of learning as well as teaching.

3.3 SUMMARY

This discussion has been somewhat protracted. It has examined the field of extension, or extension education, as a unique form of nonformal education developed over time as most appropriate for farmers and other rural people. It traces the evolution of extension in the United States and in several European and other advanced countries, and describes the inherent elements, principles and practices which have made it so successful in the advanced world. Among such components appear structure, nonformal educational theory, extension methods, linkages, the media, farmer participation, flexibility and adaptability, and

/

institutional support. The problem solving approach in extension is stressed. Learning theory comes into play in extension as do the dynamics of interpersonal and group communications, sociology, programme development and evaluation.

Next, the discussion turns to the application of a general agricultural extension model, so successful in the advanced countries, to the enormous productivity problems of agriculture in the developing world. It is noted that attempts to transfer the model in its western form to the Third World has not been very successful. Many of the reasons for the relative failure and resulting studies, insights and discoveries emerging from the struggle are examined in great detail. Still more theories, procedures, and models are studied in terms of their inherent characteristics. Specific extension successes in the Third World are documented, and new policy statements and strategy pronouncements are seen in the context of knowledge gained. The T & V system espoused by the World Bank, and the farming systems research/extension model currently sustained by USAID are touted as contemporary products of new thinking.

The conclusion to be drawn here is that extension education

continues to have a vital, central and dynamic role in agricultural development in the Third World. The challenge ahead is one of inquiry and discovery into the dynamics which can make extension a truly successful reality in the developing world and a component of improved everyday life for rural people everywhere.

The result of this review has been to establish, without question, the central and dynamic function of extension education in agricultural development. In so doing, it has satisfied the second declared purpose of this study.

The relationship of extension education to farming systems research is examined next.

CHAPTER 4 FARMING SYSTEMS RESEARCH AND EXTENSION EDUCATION: OVERVIEW AND THE LESOTHO EXPERIENCE

4.1 FARMING SYSTEMS RESEARCH

Shaner, Philipp and Schmehl (1982, p. 13) define farming systems research and development (FSR & D) as "an approach to agricultural research and development that views the whole farm as a system (and) focuses on (1) the inter-dependencies between the components under the control of members of the farm household and (2) how these components interact with the physical, biological, and socio-economic factors not under the household's control".

Hildebrand and Waugh (1983, pp. 4, 5) seem to feel that the above definition is too vast for practical management. They concur with Norman (1982, p. 1) who broke the farming systems approach into the dual components of (1) the farming systems approach to infrastructural support and policy (FSIP) and (2) the farming systems research and extension approach to technology generation, evaluation and delivery. It is this latter concept with which the current study is concerned*. Hildebrand and Waugh have simplified

* In Lesotho, FSR/E is carried on intensively in three agroclimatic prototype areas representing that country's lowlands, foothills and mountain environmental zones, although consisting in a very small part of the total land surface. Molumong has seven villages, Nyakosoba ten, and Siloe eleven.

its working definition in these terms: "FSR/E is applied, farmer oriented, agro-biological research, supported by the socio-economic sciences in a team effort which includes extension responsibilities. The principal product is technology. The primary clients are farmers". They outline the procedural steps of FSR/E as roughly (1) area survey and problem identification, (2) design of first-phase research and continuing survey, (3) generation and screening of technologies through experimentation, (4) analysis of data, (5) extension of acceptable results where appropriate. Hildebrand and Waugh think that FSR/E brings science and other expertise into a problem-solving mode through multidisciplinary teams of practitioners working closely with farmers.

Farming systems research procedural steps may be described in slightly different language. The critical components are (1) target and research area selection, (2) problem identification and development of a research base, (3) planning on-farm research, (4) on-farm research and analysis, and (5) extension of results (Shaner, Philipp and Schmehl, 1982, p. 27).

Watts and Claar, (1983, pp. 10 - 11), view farming systems

research, as currently supported by USAID, as a major conceptual breakthrough in farmer-oriented agricultural research. Nobe (1983, p. 24) sees FSR as a prototype managerial organization for agricultural development, as opposed to patronistic and administrative types; and thinks the specified results feedback mechanism is a major strength of the FSR approach.

FSR as a viable strategy for research in developing agriculture in South Africa is introduced by Van Rooyen (1984, p. 56 - 63). He singles out the farmer as the central figure in applied farming systems and thus a vital partner in farming systems research. He stresses its complementarity to traditional research but feels FSR can best take into stride the abilities and attitudes of farmers. Van Rooyen describes the essential steps of FSR as (1) description, (2) design, (3) test, and (4) extension; and feels that the interaction of forward and backward linkages between researchers and farmers is its great strength. By studying farm conditions in uniform environmental and socio-economic areas, FSR is able to develop recommendations which are applicable throughout such "domains". Another strength of FSR, according to van Rooyen, is its reliance on multidisciplinary teams in the study of

farm systems and in subsequent on-farm research and extension. He feels that, in this way, relevant human and social variables are linked to all steps of the agricultural research process. He summarizes by making a strong claim on FSR as a sensible approach to the small farmer needs of Southern Africa.

Kirby, Gallegos and Cornick (1981, pp. 3, 29) describe Cornell University's experience in Ecuador. They deduce that improvements in rural communities happen only through thorough understanding of the farming systems in place, and that multidisciplinary teams including extension personnel can best bring about that understanding. Beyond such desired understanding, the multidisciplinary teams can help identify problems, identify constraints, and evaluate through on-farm experimentation alternative farming practices.

These authors are convinced that the likelihood of adoption of agricultural innovations is enhanced by this kind of commitment to comprehension of the reality of the conditions facing farmers. The relationships developed between farmers and professional personnel are seen to be valuable in sharing the responsibility for agricultural research.

The consultative group on international agricultural research (CGIAR) is applauded by van Rooyen (1984, pp. 236 - 237) for general adoption of farming systems research in their quest for new technologies adapted to small farm conditions. He thinks FSR links farm problems to research activities and thus enhances the likelihood of adoption of innovations. Van Rooyen distinguishes between simply studying the farming system and the more problem oriented on-farm research with a farming systems perspective (OFR/FSP), the approach espoused by CIMMYT *. Since CIMMYT is one of the CGIAR centers, their widely touted OFR/FSP approach has had a notable influence on other CGIAR organizations, particularly IRRI **. He encourages CGIAR to continue even more FSR networking among their other centres.

* CIMMYT is the Centro Internacional de Mejoramiento de Maíz y Trigo, El Batán, Mexico (also in Swaziland).

** IRRI is International Rice Research Institute, Los Baños, Philippines.

Expanding on the notion of "domains", earlier mentioned by van Rooyen, Harrington and Tripp (1984, pp. 24 - 25) identify recommendation domains as the framework for on-farm research. Since the objective of OFR is to produce recommendations for farmers, then such recommendations should be reliable over a recommendation domain consisting of farmers whose farms and practices are similar and who farm within a uniform agroclimatic zone*.

Formulating recommendations for these domains (groups of farmers) will insure against the fielding of recommendations which are either too specific or too broad, thus strengthening their reliability throughout the domain. Harrington and Tripp emphasize that the recommendations which are eventually made for a given domain, are the product of close field work with the members of that domain in on-farm trials, their analysis and their acceptance.

In further description of the nature and dynamics of farming systems research; Shaner, Philipp and Schmehl (1982, p. 4) say that FSR can be summarized as being "farmer based, problem solving, comprehensive, inter-disciplinary, complementary, iterative, dynamic and responsible to society".

*This was the rationale for the Lesotho Government's selection of the mountain, foothills and lowlands agroclimatic prototype areas of Molumong, Nyakosoba and Siloe.

FSR researchers keep farm conditions in mind and integrate cooperating farmers in on-going research into solvable problems. FSR team members from a variety of relevant disciplines work together in studying all components affecting farmers' lives and the interrelationship of these components. Such studies complement basic research and the findings of other concerned organizations. FSR researchers use their findings to update their understanding of the farming systems being studied and modify further study accordingly. Dynamics are important in FSR as small modifications may lead to subsequent major changes, being at all times responsible to both local farmer groups and society at large.

Hildebrand (1984, pp. 87 - 89) suggests that scientists who work on interdisciplinary farming systems research teams must have genuine interest in the disciplines of other team members and be willing to accept observations and suggestions from collaborators outside their respective disciplines. They need to be flexible and be willing to modify field techniques to accommodate the interdisciplinary approach. Farmers too must be fully integrated into field

research for the FSR spirit to fully prevail, and for the entire team to appreciate farmers' views on their own constraints. The farmer must be the prime client for FSR to make sense and for farm problems to be solved in a prompt and realistic way. While researchers look at problems in an academic way, Hildebrand warns, farmers are concerned with the urgency and survivability of their livelihood. He thinks FSR team members must feel this sense of urgency in solving farmers' problems in order to be credible among their principal clients. While FSR developed on three continents under independent conditions, there is now general agreement as to its "essence" and its field methodology, according to Hildebrand. Surveys must be quick, relying a great deal on the cumulative knowledge and wisdom of farmers. FSR researchers must work with available resources and not waste time on wishful thinking.

Three experimental approaches to agricultural improvement in southern Mali are examined by Kleene (1984, pp. 131 - 138). He describes agronomic tests as a tool extensively used in thematic and agronomic research in development projects. He looks at full-scale demonstrations used as a vehicle for the introduction of technical "packages". Finally, he explores farm counseling as a spin-off from farming systems research as a way to help farmers assess their own situations and

resources and make decisions about farming strategies. Kleene decides that farm counseling is the best opportunity for teamwork among farmers, researchers, and extension workers toward adoption of viable farming practices. He warns, however, that farmers' skills are fundamental to real FSR partnership and that more emphasis must be placed on farmer education.

There are some problems in the implementation of agricultural research projects with a farming systems perspective, according to Norman (1983, pp. 2 - 11). Norman chooses to label his strategy as the farming system approach to research (FSAR) and says that problems arise during all phases of such projects. There are usually three parties to an FSAR venture, he says. They are (1) national government agencies such as research or extension, (2) donor contracting agencies such as USAID, and (3) the members of the research/extension team such as the Kansas State University team in Botswana. The first problem encountered may be the inadequate understanding of farming systems research and what is expected from each of the parties involved. Norman feels that the project design phase should provide a forum for reducing this difficulty. FSAR requires operational linkages among national agencies such as research, extension and planning. At times there are inadequate such linkages and FSAR is too often not perceived to be complementary of such

agencies' normal operations. A steering committee of persons representing the various national agencies is suggested by Norman as a group which can work out interagency constraints and cooperation. There is also a constraint inherent in inadequate understanding of FSAR by donor and contracting agency administration which may be seen in their inability to recruit appropriate personnel for field research teams. Contracting agencies, often universities, may experience problems in rewarding faculty members in consistent, sensible ways for overseas FSAR work. Team members, especially researchers, may have to retrain in order to cope with the conditions of farming systems research. In the initial project implementation stage, Norman identifies the maze of administrative and support systems to be a major constraint of the same general magnitude as ensuring the relevant linkages among national programmes and getting the FSAR team started. In the latter sense, there may be problems with personalities, frustrations, and the "weaning" of team members away from academic security mechanisms. Contingencies of the continued implementation of an FSAR movement, Norman points out, are data collection methodology, data analysis, the production of convincing results, adoption rates by farmers, and the destruction of months of good work by vagaries such as hail, drought or unseasonable frosts. A final constraint to be carefully considered and its reduction conscientiously sought, according to Norman, is the harmonious working relationship between expatriate advisors and national counterparts.

Rose and Tapson (1984, pp. 166 - 177) adopt an FSR approach with respect to the problems of agriculture in developing countries and as an operational strategy for University of Fort Hare's small-farm systems research activities in Ciskei. The authors recognize the frequent and frustrating fact of life for agricultural development workers which lies in the non-acceptance by farmers of innovations developed for their benefit. Much of the technology researched and recommended for small farmer use remains largely ignored, according to these authors. They liken the problem of nonadoption in Africa to large parts of the rest of the Third World. Among the phenomena blamed for nonadoption are lack of inputs, lack of roads, poor markets, ineffective extension services, and insecure land tenure systems. Prescriptive agricultural development schemes in Africa have largely failed. Rose and Tapson support Kirby, Gallegos and Cornick (1981, p. 3) and espouse the Cornell University approach to agricultural research used in Ecuador. In so doing, they accept the premise that the most severe deterrent to peasant adoption of agricultural innovation is that so much of the technology developed is inappropriate to the conditions of the small farmer. Cornell, and by extension Rose and Tapson, promote an FSR concept involving (1) understanding farmers and their practices, (2) identification of farmers' problems and priorities, (3) isolation of constraints to productivity, and (4) selection through on-farm experimentation improved

practices most likely to be adopted. Based on these convictions, faculty members at the University of Fort Hare, through ARDRI*, have implemented small-farm systems research in Ciskei. They anticipate the improvement of small farmer conditions in the region, achievement of food self-sufficiency and respectful treatment of human and environmental concerns. The research design involves chiefs, cooperating farmers, and communities whose current farming systems are studied. Problems and needs are jointly identified. A second component involves a small-farm research center at University of Fort Hare to improve, under research control, practices identified on farms. A third component sees promising concepts, crops, and practices taken back to collaborating farmers for extensive field testing under (1) researcher control, and (2) farmer control. Research results surviving phases 1 and 2 above are then appropriately extended as recommendations over a wider domain. Failures are examined as to cause, and reasonable modifications sought. Rose and Tapson summarize by seeking to study current farming systems, their reasons for currency, their methodologies, their environmental areas, and their constraints. Improvements in systems and reduction of constraints become research objectives. Appropriate innovations are extended to farmers.

* Agricultural Rural Development Research Institute
at University of Fort Hare, Ciskei.

Small farm development in the emerging world requires a shift in research and extension thinking, according to Harwood (1979, p. 118). He writes about those aspects of small farm production systems which lead to efficiency under limited resource conditions. A mix of traditional and more advanced technologies is usually called for in breaking the productivity barrier. Harwood proposes collaborative work among researchers, extension workers, and farmers in this respect.

Jones (1978, pp. 21 - 25) argues that the quality of leadership in agricultural research has traditionally been insensitive and researchers themselves indifferent to the needs of primitive food producers. He suggests that an FSR approach can lead to improvement in these conditions by encouraging people to define clear objectives and priorities. This can also lead to new research and extension models, Jones states.

The methodology of a farming systems project in Central America, is described by Lagemann (1981, pp. 2 - 30). The FSR approach is employed to characterize farms, develop and screen new technologies, and to diffuse such innovations through national extension organizations. FSR has as its

central goal the improvement of farm production and productivity, through the introduction of innovations, according to Lagemann.

Dixon (1979, pp. 442 - 448) describes a farming systems research project in Ethiopia based on the consideration of farmers' perceptions, testing recommended technology in the farm environment and the extension process. Close cooperation between farmers and extension personnel is reported. However, close and timely supervision is urged by Dixon in such areas as planting and fertilizer application. Special attention must be paid to special considerations like weed control, oxen tillage, and threshing, he adds.

Bembridge (1982, p. 97) laments that agriculture, which provides food for only a third of current populations, is the weakest link in the development of South Africa's homelands. Actual food production is in a state of decline. Neither physical nor rural development emphasises have addressed agricultural productivity. He proposes a farming systems approach to the study of the systems in place, the nature of the households involved, and the constraints to productivity. Bembridge suggests a strategy of advancing the growth potential of progressive farmers and, at the same

time, offering recommended innovations to farmers participating in a later stage of agricultural development.

Adoption of new technology in emerging agricultural countries remains lower than expected, according to Ecklund (1983, pp. 141 - 153). He links the failure to attain expected returns more with how agricultural research is conducted than with price structure or inadequate agricultural support services. Ecklund argues for national agricultural research and extension services which emphasize on-farm research with a systems approach.

Winkelmann and Moscardi (1981, p. 35) examine the explanations for the failure of farmers in developing countries to follow the recommendations made to them by researchers and extension workers. Traditionalism among farmers is often pointed up as a major constraint. Others place the blame at the door of extension services thought to be inadequate. Faulty structures responsible for credit, inputs and market are also seen by some as constraints to acceptable adoption rates. Finally, it is suggested that recommended technologies are simply not appropriate for small farmers in the developing world. All these have been true at given times and places, say Winkelmann and Moscardi.

However, they demonstrate that adoption of certain recommendations and rejection of others happen among the poorest farmers who are subject to all the vagaries mentioned above. This leads the authors to take the charge of inappropriate technologies and recommendations seriously and ultimately conclude that careful aiming of agricultural research at the needs of farmers is urgently required.

Small farmers resist accepting change because of having inappropriate technology recommended for their adoption, writes Hildebrand (1981, p. 111 - 118). He does not believe the problem is one of motivation. Appropriate technologies constitute a challenge for researchers, according to Hildebrand, because agro-socio-economic conditions of small farmers are highly location specific. Small farmers do not react favourably to technologies developed for commercial farmers. He proposes that multidisciplinary teams live and work closely with farmers in order to jointly conduct research and develop problem solving technologies. Such research mode, on the part of the scientists, represents a departure in the work norm, Hildebrand admits.

It can be seen from the foregoing review that farming systems research has become a major contemporary development

strategy throughout the emerging world. It is a strategy that reverses the direction of the more traditional basic-to-applied flow of agriculture and technology. Rather it engages the farmer as an active partner at the very outset in the identification of agricultural problems and concerns as seen through farmers' eyes and in the context of their "world". It then retains the farmer as a proactive "colleague" in on-farm research. He or she becomes one of a team of problem solvers who probe and test ideas and promising alternatives and technologies on farmers' field. At any time in this process, the farmer may accept, reject or modify an idea based on constraints identified from the farmer's point of view. Importantly the farmer is meanwhile sharing the cost of intervention and change. The theory behind the strategy, among other things, holds that if farmers have an active role in sharing with researchers their rationale for doing things the way they do, in identifying their own problems as they see them, in trying alternative solutions and changes on their own land at certain costs and risks to themselves; the results of that exercise will have a much higher probability of widespread adoption than have the results of the more traditional "top-down" recommendations of common experiment station research. Farming systems research as a development

strategy is not intended to replace experiment station research, but to complement it in a highly dynamic and realistic manner (Youmans, 1984, p.1).

With the establishment of farming systems research as the state-of-the-art approach to agricultural development, it is important to study the role of extension education in that context.

4.2 EXTENSION EDUCATION IN FARMING SYSTEMS RESEARCH

If farming systems research is to have an enduring developmental effect in the emerging world, extension education must play a central and continuing role in its implementation.

Watts and Claar (1983, pp. 10 - 12) recognize farming systems research and extension as a breakthrough in agricultural development strategy which addresses basic weaknesses in earlier development efforts. They see viable extension education equally as important as research if international agricultural assistance is to have a lasting impact. They applaud the recent expansion of the FSR

acronym to FSR/E in recognition of the vital role of extension in the adoption of technology. The basic philosophy of farming systems research remains intact as extension is built in as an effective part of every stage and as an assurance of relevant technology application at the farm level. Thus, the research/extension linkage continues to be critical. Watts and Claar conclude that the FSR brand of adaptive research and national field extension services are complementary parts of a viable agricultural development system.

Agricultural research can suffer from its rigid adhesion to technical criteria in its need to relate to managerial criteria in the farming systems research mode (Collinson, 1984, pp. 1 - 11). Strong research/extension linkage can help. This author thinks that the oft-lamented linkage failure is overstated and that a more fundamental issue is for both research and extension to adopt a managerial methodology in the development of recommendations for small farmers. He points out many difficulties in truly and jointly achieving this farmer/managerial focus. He does, nonetheless, recognize that institutional and operational gaps are a problem in African governments' response to agricultural needs but believes that a merger of technical

and managerial talents and the interfacing of researchers, extension workers, and farmers in the field can improve the linkage question. Collinson calls on extension at the senior officer level to monitor on-farm research with a farming systems perspective (OFR/FSP) in order to have an extension input into the experimental, recommendation, and managerial phase of the process. Extension field workers also have a role, he submits, in assisting the OFR/FSP teams in organizing farmer meetings, farm visits, interpretation, cooperating farmer identification and selection, laying out experiments, and results assessment. In this way, extension workers are fully integrated into the farming systems research process and thus become more effective educators during the diffusion stage.

Rose and Tapson (1984, pp. 176) see personnel from the extension branch of the Department of Agriculture as members of a research management committee in their farming systems research work in the Ciskei.

Writing on the Indonesian cropping systems programme, McIntosh (1981, pp. 123 - 125, 137) suggests that research must include all components of the production system as well

as address associated extension and marketing problems. He sees both scientists and extension workers active in site surveys and data collection for site selection and description. In preproduction testing and implementation stages of cropping systems research, McIntosh finds extension heavily involved on an increasing scale. This not only builds ties between research and extension, it provides the basis for continued monitoring of programmes by extension personnel.

A unique view of an extension role in peasant agriculture, is shared by Bernstein (1981, pp. 143 - 149) from his experiences with Harwood in China where "the major information that is being used as the basis for extension materials is not a product of "research" per se at all. Most of it has come from sending scientists and other people down to the farm level (communes) to learn from farmers, analyze what they are actually doing, record it, understand it as best they can, draw out (where it is possible) the theory and reasons to understand it, and then publish the information in extension materials. These extension materials are very effective and well illustrated."

McDermott (1984, p. 3) displays the research/extension component tasks along a graphic continuum, and fears that the professions involved too often work in the poleward reaches of that continuum. This tends to leave a functional gap in the testing and adaptation range. McDermott views FSR as a strategy for completing the cycle of the technology innovation process without such fatal breaks. He calls for thorough integration of research and extension over as much of the continuum as possible with a very strong linkage point. The on-farm trial stage of the FSR formula is an ideal opportunity to strengthen this linkage. This is especially true in developing countries where there are no extension specialists to bridge the gap between research scientists and extension field workers, McDermott concludes.

Current programmes and the advantages of improved research/extension linkages in the institutionalization of farming systems research and extension in Botswana are addressed by Baker (1984, p. 5). He thinks the Botswana government realizes the need for integration of agricultural research, extension, and planning as well as the development of farmer centered policies and technologies which form the base for continuing extension programmes. That realization has led the government to adopt an FSR/E policy for

agricultural development under which several donor project teams operate. Baker describes the various approaches taken by those projects to (1) make FSR results viable and useful to extension, and (2) to find better ways for extension field workers to assist FSR teams in their work.

Low (1984, pp. 3 - 5, 13 - 14) writes on farming systems research in Eastern and Southern Africa and sees some shortcomings in research's predisposition to communicate adequately with extension workers and small farmers. He thinks there is a top-down flow of agricultural information to the field and calls for a more developed feedback mechanism in order to communicate the acceptability to farmers of research results. Low urges appropriate extension messages which can derive from farming systems research, and calls for strengthened linkages as well as the development of farm recommendations from a managerial perspective. He thinks careful on-farm research can produce such recommendations.

The development of extension programmes for conservation cropping in Queensland, according to Chamala and Keith (1984, p. 9), follows Shaner's criteria in that it is farmer-based, problem solving, interdisciplinary,

comprehensive, complementary, dynamic and responsible to the short and long term goals of society. They view extension as a parallel activity to research and development, planned from the same perspective and oriented toward the same goals. As such, extension contributes to the integrated development process at all stages.

Wijessoriya (1980, pp. 1 - 6) cites extension's role in the cropping systems pilot production programme in Sri Lanka as a partner in the development of a methodology to extend improved systems to farmers. The demonstration method is pointed out as an important tool of the extension worker that obtains better acceptance than simple instruction. Wijessoriya also believes the demonstration provides a learning as well as a teaching experience for extension workers and can effectively be used to communicate farming methods, results of farming practices and solutions to farm problems.

There are examples of agricultural development activities through which some countries are producing adequate food and are improving the productivity of land and people, states Waugh (1978, pp. 2 - 19). He points to new strategies where both scientists' and farmers' expectations are met. He urges strong linkages between research and

extension in support of such systems but does not feel that research and extension must be structured together in order to function together. Waugh agrees with McDermott, however, in his contention that both must work together in effecting a continuum from technology generation to its incorporation by farmers. Such methods create a role in the field for "farmer extensionists", according to Waugh.

Easter and Hlope (1984, p. 16) credit the implementation of a structural reorganization of extension, the emphasis of subject matter specialists' role in agriculture, and the adaptation of the training and visit system of extension as real advances in a cropping systems research project in Swaziland. They view the linkage question as an objective of the project team. Hudgens (1984) describes the process followed in Zambia to introduce a farming systems perspective into the extension branch of government and to teach extension workers to fit recommendations to socio-economic and agroclimatic realities of their work sites.

The Francophone FSR approach differs from that sustained largely by U.S. universities, says Fresco (1984, p. 20).

She describes the Francophone model as a large scale effort directed at the long term development of a region linked with extension and input supply. In contrast, the American FSR model focuses on adapting research results to small farmer needs within prevailing constraints.

Winkelmann (1976) describes the internal dynamics of Mexico's famed Plan Puebla. The objectives of the project are the development of a profitable technology for maize production and a system for diffusing it. The methodology in the field includes on-farm experimental work, use of farmer contact groups in dissemination of information, provision of credit, supply of inputs, repayment of loans and the evaluation of outcomes.

Administrative structures coordinate the roles of research, suppliers of inputs, providers of credit, extension, and farmers. Extension workers from other parts of Mexico are trained in these methodological components. Plan Puebla has been able to demonstrate increase and declines in extension activities corresponding to the extent of regulatory and other tasks assigned to extension workers. Winkelmann puzzles through early years' outcomes of Plan Puebla and explains how extension is helpful in discovering why farmers do not respond according to assumptions of predicted

behaviour. While he continues to support a strong extension profile in methodologies like Plan Puebla, Winkelmann warns about making recommendations all inclusive and too rigid in their implementation. He concludes that farmers are generally interested in profit but recommendations involving greater inputs, at greater risk, with promise of only marginally greater profits are generally avoided by small farmers.

The Nile Valley project is a model for cooperation between international and national programmes in research and extension, write Hawtin et al (1984, p. 29). They point out as a highlight of the project, the direct involvement of extension workers and farmers in on-farm trials. Since both Egyptian and Sudanese nationals have performed the majority of research and extension work, the authors point out the cost-effectiveness of the project.

Johnson and Claar (1984, p. 36) hold that extension is vital to successful FSR programmes. There is strong and obvious interconnection between research and extension in such efforts, and it becomes extension's mandate to recognize the new opportunities created by the FSR methodology. To do this, extension must abandon shopworn methods and become a

full partner in the shifting and dynamic technology diffusion continuum created by the FSR philosophy. Coevolutionary change in both research and extension are called for by Johnson and Claar.

The agricultural service network in the rice cultivation areas of Malaysia and Surinam, is examined by Kalshoven (1981, pp. 89 - 124), who finds an institutional approach at work in Surinam where extension offices are in place and the provision of farming inputs complements extension work. In Malaysia, inputs and credit are made available through farmers' associations. Kalshoven finds that extension field workers experience the same constraint as farmers in that resource scarcity inhibits their effectiveness as change agents.

Duval (1978, pp. 59 - 61) presents a model for the utilization of farmers' groups in South Africa in the development of a management information system and in reaching the greater community via programmed agricultural development. His is a hierarchical model involving a central development committee, programme planning committees, and study groups. All include major roles and responsibilities for farmers, permitting maximum use of the

extension agent's time as manager and educator. Progressive farmers are also linked with subject matter specialists in order to develop realistic parameters for agricultural development programmes.

Agricultural extension is the key to rural development in the present and former homelands of South Africa. Bembridge (1978, p. 252) describes the current situation of agricultural productivity in the homelands and lists population growth, fragmentation of land holdings, and deterioration of land resources as principal constraints. Former rehabilitation and capital intensive development schemes have largely failed, according to Bembridge, because of an inadequate knowledge of and respect for local socio-economic considerations. He calls for a multidisciplinary systems approach to agricultural problem solving in the homelands to include farmer-focused research, provision of credit and inputs, people-oriented extension methods, and reasonable marketing structure, in order to foster meaningful change in peasant agriculture.

The lack of communication between research and extension organizations in developing countries is not a serious constraint to technology transfer, but lack of integration

is. Such lack of integration can frustrate the otherwise positive thrust of farming systems research, says Poey (1984, p. 56). Sometimes the validation process in FSR is interpreted as an invasion by research into the demonstration realm of extension. Poey suggests that obstacles can be removed and integration achieved if extension is involved in and shares ownership of the later stages of on-farm research and thus becomes totally familiar with resulting recommendations. These are then jointly promoted.

Youmans (1984, p. 1 - 5) warns that FSR is not a panacea. Farmers, in any areas, are by nature independent, suspicious and conservative. They take certain risks only if they are convinced of the wisdom behind the risk. He describes the trust bond between extension worker and farmer as a sensitive and carefully nourished relationship which rides precariously on the credibility of the former. The FSR practitioner must learn the principles of that axiom. Certainly, the FSR approach must be adapted again and again in cognizance of fluctuating economics, variability of the resource base, and differences among social and cultural systems. Agricultural economists are the first to agree that the "whole farm" focus can be grossly distorted by an

anomaly in the farm management formula, such as massive migrant labour. Yet another notion which must become part of the working rationale of FSR researchers, according to Youmans, is that they cannot wait for "full information" on any aspect of FSR research before venturing recommendations. Full information is never at hand. Data are always forthcoming. In the meantime, farmers continue to farm, take risks, and to win or lose.

FSR researchers, in order to become credible among farmers, must take some risks as well, Youmans suggests. They must project themselves into the farmers' circumstances by hypothetically exchanging their annual salaries for one or two hectares of land in a developing country. Then, armed with the average access to resources they see around them, they should share with farmers the recommendations they themselves would follow in order to survive, improve, and provide for their families on that land! In that way, they will become more credible practitioners. Before any real gains can be made toward the challenge of widespread adoption of FSR recommendations, Youmans adds, practitioners must accept two basic notions. First, if an FSR project does not include a very strong extension component, then it is probably not truly FSR. Second, if extension is not

essentially nonformal education, then it is not truly extension.

Most proponents generally agree that the FSR sequence must include the following major activities: (1) target and research area selection, (2) problem identification and development of a research base, (3) planning on-farm research, (4) on-farm research and analysis, and (5) extension of results (Shaner, Philipp and Schmehl, 1982, p. 27).

Youmans sees the selection of target groups and programme areas as essential to all extension programmes, thus well-known concepts in extension can be used to accomplish this FSR activity. Problem identification and the development of a research base can profit by the use of extension needs assessment and programme rationale techniques. Planning on-farm research is a process not dissimilar to demonstration programme development in extension. On-farm research and analysis, in the first instance, is closely associated with demonstration or trial work in extension. Analysis, in and of itself, may be the only component of FSR which falls wholly within the research domain. However, the extension of results is and remains

the province of extension practitioners.

Given the preponderance of extension principles in farming systems research, Youmans thinks that extension practitioners must be party to the FSR process at all stages. Both the research community and major donor organizations must come to understand this. FSR ideally is a process through which farmers' needs and research capabilities become a common theater of activity. This cannot happen without a third actor, namely extension. The maximization of desirable dynamics is best achieved by having extension personnel involved at every stage of the FSR formula. Evaluation should be cyclical, not linear. Modifications should be made when required, insuring the flexibility of the process. The shared efforts of research, extension, and the farming community can most certainly provide the critical ingredients for FSR endeavours everywhere, Youmans concludes.

A substantial basis for Youmans' assessment is provided by Shaner (1983, pp. 45 - 53). In his treatment of the linkage of extension with farming systems research, Shaner shows how farming systems research speaks to groups of farmers whose like conditions favour adoption of similar technologies. He

sees FSR as a unique opportunity for building research/extension linkages. Shaner explains that FSR is farmer-based since there is considerable effort expended in learning about farmers' conditions through a variety of investigative methodologies. Knowledge of farm conditions is fundamental to the launching of a problem-solving research programme in which minor initial changes can lead to more significant innovations over time. FSR is comprehensive in that it proceeds within the context of the whole farm structure. Normally, this requires an interdisciplinary approach to field research which should be complementary to former and/or more basic research, and to knowledge derived from other sources. Shaner prescribes that FSR is iterative and dynamic in that it is repetitive and self-adjusting. Early on-farm research provides knowledge and experience which can be used to modify further research. Finally FSR is and must be responsive and responsible to society in both its short term and long range consequences.

There is no stage of farming systems research in which extension should not be involved, according to Shaner. On the contrary, extension inputs are important to target and research area selection in view of extension knowledge of

farmer and environmental conditions. Problem identification and the development of a research base are activities which make considerable use of extension expertise in both its familiarity with the area and in its methods for gathering information on situation and farmer clienteles. An added advantage is that of integrating extension into FSR while problems and opportunities for research are being articulated. Extension's knowledge of environment, organizations, input situation, markets and socio-cultural constraints is helpful to the planning of on-farm research. That research itself is often assisted by extension personnel, thus augmenting the manpower available for the task. The diffusion of recommendation produced by the foregoing FSR process is the province of extension and is made more effective by its having been involved in all previous steps. Shaner, in depicting the extension involvement graphically, sees extension carrying sizeable responsibilities in site selection and problem identification and performing the major role in multi-locational testing and extending recommendations. He closes by saying that the FSR focus on understanding farmers in their environment, identifying farm problems, and designing and implementing on-farm trials together with farmers provides the ground for a central and critical extension input.

4.3 EXTENSION EDUCATIONAL PROGRAMMES IN FARMING SYSTEMS RESEARCH IN LESOTHO

Farming systems research has been a dynamic component of agricultural development in Lesotho since 1979, and extension plays a central role in that involvement. The Farming Systems Research Project is funded by USAID under contract No. AID/afr-C-1517. The contractor is Washington State University, one of the institutions of the American land grant university system. The expatriate personnel attached to the project are faculty members of Washington State University, and national counterpart personnel are employees of the Lesotho Ministry of Agriculture and Marketing.

Lesotho is a small mountainous African kingdom, surrounded by the Republic of South Africa and its satellites, which occupies about 30350 square kilometers. This is approximately the size of the American state of Maryland. The United Nations lists the kingdom among the 25 least developed countries, largely because of its late start in development activity. Agriculture is the most important sector, economically and in terms of indigenous employment.

Mohair is the most valuable agricultural product. The population of Lesotho is roughly 1.2 million, of which nearly 200 000 work in the RSA, principally in the mines. Some five percent of the home population resides in the urban centers while the great majority live in villages throughout the country. Some of the latter are remote. The country has roughly 900 000 acres of arable land, less than one acre per capita. Much of the remaining terrain is traditionally grazed. Elevation ranges between 1 400 metres and 3 500 metres. Periods of drought are broken by severe rains which contribute to critical soil erosion. Hail is common and accounts for frequent crop losses along with untimely frosts. Snow occurs routinely at higher elevations (Lesotho Farming Systems Research Project Paper, 1978, p. 1).

Agriculture in Lesotho is largely of a subsistence nature. Some 85 percent of the population derive income from agricultural activities. If 56 percent of the labour force works in country, fully 92 percent of those are employed in agriculture. Principal crops are maize, sorghum and wheat. Cash crops include beans, peas, and some wheat. Livestock are principally cattle, sheep, and goats. On-farm consumption accounts for 70 percent of crop production.

Animals and animal products make up 70 percent of Lesotho's exports, while crops, largely wheat, account for another six percent. Lesotho produces roughly one-half of its food supply. Because of the country's communal land tenure system and the widespread incidence of migrant labour, uniformity of rural income is a unique phenomenon (Lesotho FSR Project Paper, 1978, p. 2).

Constraints to agricultural productivity thus include severe weather conditions, limited arable land, serious land erosion, and the intervening opportunity for mining labour. Shortage of draft power and non-productive traditional farming practices are also important. Inadequate use of fertilizer, low quality seed, poor tillage, lack of pest control, improper weeding, wasteful harvesting methods, and post-harvest losses all contribute to low productivity in crop production. Improper range management, overgrazing, lack of supplemental feeding, disease, and poor management affect both animal productivity and the quality of the resource base. It is some of these problems that farming systems research and extension seek to address*.

The FSR project in Lesotho has as its principal thrust the improvement of rural life by increasing the incomes of

* These underlying causes of low productivity formed the rationale for proactive extension education programmes among farmers, chiefs and extension workers in the context of FSR/E in Lesotho. Because of the interdisciplinary approach, problems were addressed simultaneously.

Basotho farmers. In doing this it works toward the creation of farming systems as rural enterprise mixes designed to improve farm productivity. Though largely directed toward on-farm research and institution building, emphasis includes finding the most appropriate means of transferring knowledge and gaining farmers' acceptance of recommended technology through extension*. The project is farmer-centered in that recommendations must be acceptable to farmers, sensitive to their management capability, appropriate to their resources, and protective of Lesotho's badly eroded land base (Lesotho Farming Systems Research Project Paper, 1978, p. 4).

While agriculture is the most important sector to the gross national product of Lesotho, farmers do not readily adopt innovative and potentially productive farming practices**. Keeping in mind the lessons learned about the "appropriateness" of recommendations; the FSR researchers and extension practitioners aim research toward the development of reasonable enterprise mixes, problem solving in the area of farming practices, and innovations which are feasible and affordable. This work is done together with cooperating farmers and members of village agricultural committees, with a goal of five percent adoption by farmers in prototype areas by project end in 1986.

* These were the general objectives of the FSR intervention.

** This is the principal problem underlying extension education programmes.

Inherent in FSR activity are on-farm research and adaptation of results to Lesotho farm conditions, building a national agricultural research capability within the Ministry of Agriculture and Marketing, and investigation into promising extension methodologies for transferring appropriate technologies and gaining farmers' acceptance thereof (Lee, 1985, p. 1).

Expatriate personnel deployed to Lesotho by Washington State University in advisory roles include administrators, farm management economists, a social analyst, agronomists, an animal scientist, marketing economists, range management specialists, a horticulturist, and a communications/information specialist (replaced by an extension educator since 1981).

Lee (1985, pp. 3 - 5) points out that farming systems research is fully integrated into agricultural research division activities. Agronomy and horticulture sections test new varieties of crops and seek cultural practices best suited to local conditions. Soil and plant protection units complement these activities with expertise and recommendations. Farm management personnel, cooperating

with other sections, develop production enterprise schemes based on FSR principles. Marketing officers study market systems for livestock and crops and make recommendations to farming communities. Animal science and range sections work together toward sound but affordable animal management practices and recommendations protective of soil and natural vegetation resources. Lee explains that "the Extension Section holds farmer training sessions, schools for extension field personnel, interacts with Village Agricultural Committees, and prepares radio programmes and extension circulars on a year-round basis". Field days are held in conjunction with the cropping season". While the work focus of the initially deployed FSR information/communications specialist is manifest in the extensive publication of research circulars and other on-going communications systems (Beckerman, 1981, pp. 1 - 14), the principal researcher, and current FSR extension specialist operates under much wider terms of reference. Those terms of reference assume at least a Master's degree with academic preparation in extension, continuing adult education or community development. Previous experience in developing countries is called for, along with evidence of successful nonformal and extension education accomplishment (Bath, 1980, p. 2).

*These, and other activities above, are in fulfilment of FSR/E objectives.

The current extension effort within the context of farming systems research in Lesotho is expected to provide training and guidance to field extension staff in principles and methods of extension education to facilitate the transfer of research findings to village farmers*. It also must design, test, and monitor alternate methods for involvement of farmers in cooperative agricultural production and management, as well as alternate methods whereby communications can be improved among project staff, field extension staff, and farmers. In so doing, extension is to obtain evaluative feedback from farmers, field extension personnel, and others concerning new farming practices (Bath, 1980, p. 1).

Further, extension is called on to couch technical research findings and activities in language or other dissemination approaches that are compatible with farmers' literary levels and cultural backgrounds. Coordination of technical information delivery to village households through extension staff and provision of feedback facilitation is part of the FSR extension role; and the conduct of continuing education for extension field workers, subject matter specialists and other local leadership is anticipated**. Extension is

* A capability found to be deficient by the Lesotho Government prior to 1979.

** In order to strengthen deficiencies mentioned above.

likewise responsible for the documentation and in-house publication of research findings. Finally, the extension specialist himself is expected to demonstrate the potential of the advisory appointment as an extension research educator (Bath, 1980, p. 1 - 2).

Progress toward the above terms of reference, which carefully documents the nature of extension programmes within the context of farming systems research in Lesotho, is presented four years later (Youmans, 1984, pp. 1 - 10), as follows.

4.3.1 Extension education

Extension education in methodology, field techniques, farmer involvement, communication and programme evaluation is in fact the central thrust of Extension's work in Lesotho*.

4.3.2 Extension for improvement of farming systems

Thirty-one (31) area extension officers and research extension assistants from all areas were given 80 hours of instruction in extension methods and techniques and in technical subject matter at Mazenod during February 1982 at an "Extension for

* This is in compliance with problem areas defined by the Government of Lesotho and contemplated in the scope of the Farming Systems Research Project.

Improvement of Farming Systems" course. The course enjoyed the participation of research, extension and FSR.

4.3.3 Programme development education

Four (4) research extension colleagues received in-service education in the programme development process in April 1982. Emphasis was placed on the programme development cycle in extension and University of Nebraska slide-tape materials were used to assist the instruction.

4.3.4 Professional improvement in agricultural extension*

Thirty (30) district extension officers and subject matter specialists received intensive instruction in extension methods appropriate to developing agriculture for one week, followed by a second week of training in technical agriculture at the "Professional Improvement in Agricultural Extension" course at Airport in July 1982. Extension specifically developed lectures in extension philosophy, communication skills, and programme evaluation.

* Rationale for activities in 4.3.2 and 4.3.4 is explained fully in Chapter 7.

4.3.5 FSR training for REA's and PCV's

Eight (8) research extension assistants and Peace Corps volunteers were trained for one week at Maseru in September 1982. Items covered included orientation to the research division library, FSR enterprise combinations, agronomy, animal science, plant protection, soils lab, range management, horticulture, farm management, marketing, rural sociology, visit to Nyakosoba, and the role of the PCV vis-a-vis REA in prototype areas. Extension contributed significantly to the latter item.

4.3.6 Direction of extension seminar

Extension provided conceptual information in connection with the "Seminar on Direction of Extension" held for ministry heads of divisions in October 1982. Information and impressions were supplied referent to centralization-decentralization, generalist/specialist extension work, and the strengths and weaknesses of the T and V system extension.

4.3.7 Farmer motivation seminar

Extension contributed expertise to both the planning and execution of a "Seminar on Farmer Motivation" held in

October 1982 at the Research Division, during which the special problems of farmer (and extension worker) motivation were studied among extension professionals of Extension and Research Divisions.

4.3.8 REA/FMA training on coordination of work

Eight (8) research extension assistants and farm management assistants attended a training course at Maseru in July 1983. The theme for the course was coordination of field research and extension, training, enterprise combination testing, trials, livestock and range activities. Extension contributed to the organization, execution, instruction and documentation of the course.

4.3.9 Plant and soil subject matter specialists short course*

A short course was held for twenty-eight (28) of this important group of agricultural professionals in August

* Rationale for activities mentioned in 4.3.9 and 4.3.11 is described fully in programme descriptions in Chapter 7.

1983. Significant joint planning was involved in this course work with Research Division, Extension Division and Lesotho Agricultural College participating. A variety of faculty were also engaged. Extension participated in the design, implementation, instruction, ceremonials and documentation of this important course.

4.3.10 Peace Corps orientation

Extension organized the orientation of new Research Division Peace Corps Volunteers in August 1983. The PCV's included two persons for the Molumong prototype area, one for Nyakosoba and a Maseru-based agronomist. PCV's were exposed to programme information from a variety of research officers and expatriate specialists and to job expectations by extension and farm management personnel.

4.3.11 Extension schools ("The Extension Challenge")

After considerable reflection on the evaluative outcomes of earlier extension and subject matter specialist training, further field-based needs assessments confirmed the urgency for country-wide extension education in methods, techniques and delivery skills. FSR formed a travelling faculty

comprised of administrative and extension personnel from Research Division and two officers from Agricultural Information Services. Extension Division personnel participated in curriculum development. The final curriculum contained instruction in (1) relation of research to extension, (2) needs assessment techniques, (3) group process and dynamics, (4) organization and maintenance of farmer contact groups, (5) communications skills, (6) extension teaching methods, (7) visual aids, (8) motivation and (9) evaluation. Ten extension schools were conducted in all districts of Lesotho. All district-based agricultural professionals, both extension and subject matter specialists, were encouraged to attend. During November through March 1984, two hundred and seventy two (272) MOA workers attended the schools, clearly the most comprehensive continuing education programme in extension education in Lesotho's independent history.

4.3.12 Involvement of farmers in FSR

Comprehensive activities have been systematically executed in order to maximize farmers' familiarization with and participation in FSR dynamics.

a) Village agricultural committees (farmer contact groups)

The VAC has been the principal (but not exclusive) structure for the involvement of villagers and farmers in the conceptual, educational, practical and evolutionary aspects of FSR/E. Elected by villagers themselves on an annual basis, VAC committee members tend to be active persons who are engaged in farming and seen as leaders by peers*. Systematic VAC training was conducted. Molumong VAC members were trained in March 1982, February 1983, and February 1984. Nyakosoba VAC's were trained in April 1982, April 1983 and February, 1984. Siloe VAC members attended training in May 1982 and May 1983. Collectively, one hundred and ninety four (194) members received direct instruction by RD extension and technical officers. Instruction involved both FSR/E and technical agriculture.

b) Shift from FTC's to FRC's for farmer training

Early VAC training was conducted at the farmers training centers in Mokhotlong, Matela and Mhale's Hoek. The rationale was to utilize ministry facilities where food, lodging, classrooms and training capabilities were available for that purpose. However, numbers of trainees were

* If not fully representative themselves, VAC (farmer contact group) members are seen as those farmers most likely to influence others.

constrained by size of facilities, preoccupation with happenings at home was always a distracting factor, training costs were comparatively high and logistics were complex. After the completion of the RD/FSR field research centers in the prototype areas, their use as "people's universities" was encouraged by the Minister of Agriculture. Considerable misgivings about the conduct of ambulatory or commuter training, non-provision of food, and attrition accompanied the shift of farmer training to the FRC's. The positive net result of two years experience has been increased attendance, a willingness by farmers to invest in their own education, decreased cost to the ministry and simplification of educational logistics.

c) Education for village chiefs and headmen/women

It became evident that village chiefs, headmen and headwomen were vital to the conduct of FSR/E in Lesotho. It was likewise evident that misgivings on the chiefs' part about FSR in the prototypes had their principal roots in lack of knowledge or communications breakdown. In January of 1983, it was decided to bring prototype chiefs, headmen and headwomen together at Matela FTC for training in FSR/E, the role of the chief in agricultural development, and technical

agriculture. Short courses for this purpose were conducted in February 1983 and February 1984. Some thirty (30) local officials have benefited from this activity.

d) Cooperative education

Consistent with the Minister of Agriculture's directive that farmer contact groups take advantage of legislation favouring agricultural cooperatives, it was decided to provide education in the principles and dynamics of agricultural coops for the village agricultural committees in Molumong and Nyakosoba. The curriculum was standardized to meet the laws of the land by personnel of the Ministry of Cooperatives and Rural Development and trainers trained in that ministry. Thus, the appropriate personnel were engaged to cooperate with RD/FSR/E in the delivery of instruction and subsequent cooperative organization work which took place in Molumong and Nyakosoba in February 1984.

e) Nutrition education

Consistent with FSR/E work in home gardens, in collaboration with the Nutrition Section of Extension Division and as one more vehicle for farmer involvement, nutrition education was

conducted in the prototype areas. Instruction on family nutrition as well as food preservation, storage and preparation was conducted. Short courses were given in Nyakosoba in January 1983 and in Siloe in February 1984. One hundred forty-two (142) women attended these courses.

4.3.13 Field communication

There is a continuous need to devise and improve upon systems through which maximum communication can be maintained among RD/FSR team members, field extension staff and farmers. Considerable success has been achieved in several ways.

a) Farmers field days

Farmers field days, (Nyakosoba, March and December 1983) (Siloe, November 1983 and January 1984) (Molumong, March 1984), have provided excellent opportunities for expatriates and research officers to share two-way communication with farmers, facilitated by the research extension assistants.

b) REA field programme supervision

Regular supervision of the REA's and PCV's field programmes was provided by extension research personnel. This contact and personal exchange provided another opportunity to maintain communications in the field. Despite the above, good communications at the field level continue to present a real challenge.

c) Radio communications

The installation of two-way radios in Maseru, Mokhotlong, Molumong, Siloe and Nyakosoba, is expected to improve field communications significantly.

4.3.14 Evaluative feedback

There is a constant need for evaluative feedback from farmers, field extension staff and others respecting development of farming systems activities. This was accomplished in a variety of ways.

a) Evaluation of educational activities

In all farmer education activities, such as VAC and chiefs training, both written and verbal evaluative feedback were gleaned. In each and every event, participant responses were programmed into the activities. Likewise, REA's were in constant contact with VAC's at regular meetings and relayed farmer feedback to RD/FSR. Improvements in this operational aspect are, nonetheless, to be sought.

b) Farmers as instructors

The most dynamic feedback technique used was the engagement of cooperating farmers as principal teachers during farmers field days, and at VAC short courses. The manner in which farmers grasped, executed and were able to share and demonstrate FSR activities and outcomes with others was dramatic. More of that is certainly desirable.

4.3.15 Dissemination of research findings to farmers

Dissemination of research findings to both villagers and farmers was amply absorbed into the farmer education strategies described above. There is one major indirect

technique used which has not been explained, the radio.

a) Radio programmes

Extension research conducted a systematic farmer education programme by radio, in Sesotho, on relevant research-generated topics and in the vernacular of the rural community. This activity was performed in collaboration with Agricultural Information Services and Radio Lesotho, but all programmes were prepared and voiced by Extension research. From 1982-84 ninety-nine (99) radio programmes were aired. Extension research attempted to assist and improve AIS's farmer education effort in Sesotho.

4.3.16 Coordination of research information delivery

There are two major activities not previously mentioned which were important in the coordination and delivery of research information:

a) Research Division field days

These field days were vital in the coordination and delivery of research information to the professional agricultural community. Extension was instrumental in the organization

and conduct of these field days. Field days at the Maseru, Teyateyaneng and Leribe experiment stations were held in February 1982, November 1982, January 1983, May 1983, June 1983, December 1983, January 1984 and February 1984. Some 432 persons attended these field days.

b) Pitsos

Three information pitsos were held in connection with the dedication of the Field Research Centres. All were attended by important functionaries of the Ministry of Agriculture and USAID Mission. Characteristic of these pitsos was that held in February 1983 at Molumong, attended by over 1000 persons, where the Honourable Minister of Agriculture, hailed the FRC's as "people's universities". Likewise, awards pitsos were held in connection with VAC short course certificates. A great deal of research information was shared on those occasions.

4.3.17 In-service training

Although all the above described training of MOA staff, chiefs, PCV's, farmers and others was indeed in-service, there is one remaining area which deserves mention, namely the in-service training organization for extension research personnel.

a) Continuing education at RD/FSR

A great deal of the in-service education of Extension colleagues at RD involved learning to do by doing. The frequent development of educational events and programmes involved the utilization of everyone's strengths and talents and a great deal of mutual learning. In-service education was formally conducted on the programme development cycle. In June 1982, a research extension assistant attended an intensive USDA course in Extension at University of Missouri and participated in a guided field experience at Washington State University.

A rural sociologist departed in May 1983 for a degree programme at Washington State University. An in-service photography course was organized for all members of Extension research, under the tutelage of an FSR advisor. Members of the section also attended an introductory computer workshop in December 1983.

4.3.18 Reports and publications for MOA and others.

Of course, the publication of research findings was central to Extension's role in Lesotho and was performed systematically.

a) Research circulars, bulletins, reports and special publications

It is to the lasting credit of the former expatriate advisor that a system for dealing with the publication of research results was designed and set in motion. The notion of simplifying single research topics in research circulars (fact sheets) which could form pages of a field manual in a dynamic and growing way, was a fact of life when the current expatriate advisor and principal researcher arrived on Lesotho assignment, and a few circulars had already been printed. It remained for Extension, however, to ramrod and edit the majority of the circulars now in print, and to extend the system to include the publication of reports, bulletins and special manuals and handbooks. The work was and is done by commercial printers since the Agricultural Information Services capability falls short of Research Division requirements. Some forty-one (41) circulars, twenty-nine (29) reports, thirty-two (32) bulletins and two (2) handbook/manuals were published. A standard distribution is made of these publications to assure that MOA professionals and other agriculturalists are best served.

4.3.19 Collaboration with research extension network

Collaboration among professionals toward a more fruitful research extension education network is desirable and

involves a realm of activity to which Extension contributed a great deal.

a) With Extension Division and AIS

There was considerable effort toward bringing about a clearing-house effect on education, training, investigation, information and other common concerns among Research Division, Extension Division and Agriculture Information Services. Monthly meetings were and are held in order to share information, plan events and solve problems. Most RD/FSR extension education has enjoyed the inputs of those two entities.

b) With other technical divisions

In some of the educational events, RD/FSR required more expertise than then found at RD. Other MOA technical divisions were invited to participate and did. Thus emerged a healthy relationship and numerous joint efforts among RD, Crops Division Farm Machinery, Livestock Division, Range Division, Conservation Division, Nutrition Section, and LAC.

d) With international project staffs

It is significant that Extension helped host the Pennsylvania State University delegation from the Cropping System Project in Swaziland who consulted and conferred in Lesotho about common concerns. Likewise, Extension travelled to Botswana in February 1984 to visit with personnel of GOB/MOA and Kansas State University's ATIP* (FSR) project. That international exposure was most rewarding.

e) With international consultant teams

There was a constant flow to and from Lesotho of consultants, project designers, project writers, project evaluators and voluntary agency personnel. In agriculture, it was inevitable that nearly all of them made major stops at Research Division and most of them consulted Extension/research.

* Agricultural Technology Improvement Project.

The foregoing demonstrates the central and dynamic role of extension in farming systems research in Lesotho. The role continues, embracing expanded farmer education programmes and a series of agricultural extension schools in the districts. However, these current activities fall beyond the scope of this study.

There are several experiences somewhat unique to Lesotho, which have been published in the interest of sharing them internationally.

Youmans and Holland (1983, pp. 11- 12) describe the special problems encountered in extending FSR results in Lesotho under circumstances in which the male head of the farm household is, more times than not, a migrant labourer. Such persons are farmers only in name since, in reality, they are fulltime miners. The tendency, however, is not to relinquish full decision-making authority to wives, who are in fact the farmers on the land. These conditions have special implications for the design and dynamics of extension programmes.

Youmans, Trail and Matobo (1984, pp. 75 - 76) point out the importance of the village agricultural committees in terms

of their value as contact groups, extension education organizations, volunteer leaders, and farmer/teachers. Committee members assist in identification of problems, on-farm research, and extension of results.

Youmans (1985, p. 11) likewise identifies the critical nature of linkages in the farming systems research process and draws on the Lesotho experience in his discussion. FSR is fully integrated into the Research Division of the Ministry of Agriculture and expatriate advisors work as one with national colleagues. Extension professionals have been assigned to research as full members of the FSR team and an important part of their mandate is to build linkages for joint planning and programme delivery among the extension and other technical divisions of the Ministry. Youmans concludes by describing linkages also at work with other ministries and donor-funded projects.

4.4 SUMMARY

Farming systems research is a development strategy which aligns agricultural research with real life problems and needs of small farmers in the developing world and conducts that research in such a manner that scientists and farmers

become problem solving partners, seeking solutions to low productivity directly on farmers' fields. Recommendations for new technologies, innovations and practices emerging from that exercise must be introduced to, and adopted by, larger numbers of farmers for any significant change to endure. The accepted steps in the FSR strategy are (1) target and research area selection, (2) problem identification and development of a research base, (3) planning on-farm research, (4) on-farm research and analysis, and (5) extension of results.

While the latter is traditionally the common and exclusive province of extension personnel and systems, it has been found that, in farming systems research, extension must play a much expanded role if the results of the FSR strategy are to have lasting effects among small farmers. Indeed, extension practitioners not only assist scientists and farmers in performing the several steps of the FSR process, they provide vital expertise and linkages without which the strategy cannot achieve its maximum impact.

In Lesotho, extension education plays a central and expanding role in FSR dynamics. Extension personnel assigned to the Research Division are members of a team which

helps identify sites, problems, and target farmers. They work in cooperation with researchers in on-farm research and demonstrations and in the extension of results. In addition, extension takes the lead in the organization and delivery of nonformal education programmes for three vital groups in the FSR process. These are farmers, chiefs, and extension workers and subject matter specialists of the Ministry of Agriculture. Further, extension develops linkages, advises consulting teams, counsels research scientists, provides feedback, and is responsible for the publication and other dissemination of research results in ways suitable to farmers, extension workers, scientists and other sector personnel.

In conclusion, extension education is a vital component in the farming systems research formula in Lesotho and in the rest of the developing world. This conclusion satisfies the third component of the purpose of this study as stated in Chapter 1. Since extension education of farmers, village chiefs, and government extension workers and subject matter specialist is such a central part of extension's role in Lesotho and such a vital component of the FSR project itself, the impacts of those three areas of activity are studied and analyzed in subsequent chapters. /

CHAPTER 5 THE IMPACT OF FSR EXTENSION PROGRAMMES ON MEMBERS OF FARMER CONTACT GROUPS IN LESOTHO

5.1 FARMER CONTACT GROUPS*

Early in the history of farming systems research in Lesotho, it became clear to both expatriate and national practitioners that the farmers engaged as cooperating farmers for field trials and enterprise testing would be far too few to constitute an effective network for the diffusion of agricultural innovations. Fortunately, the FSR expatriate team included an extension communications specialist supported in his mandate by a team leader and a rural sociologist, both well founded in extension education theory and methods. Concurrently, the Lesotho Ministry of Agriculture concluded that an extension and communications section must be attached to the Research Division in order to liaise with other ministry divisions and to facilitate cooperation and diffusion of innovations among farmers. Thus, a cadre of extension oriented personnel was present at the outset to deal with the joint problems of farmer organization and extension education.

* Members of farmer contact groups (VAC's) are farmers themselves elected by residents of villages for their known leadership and farming abilities. They are perhaps more innovative than representative. These groups are active only in the FSR prototype areas.

Considerable talent was brought into the exploration of concepts deriving from extension education, cross-cultural communications, local tradition, group dynamics, and diffusion theory. This served not only to confirm the need to organize a farmer-based diffusion network but also gave emphasis to the desirability of making such network as consistent as possible with Basotho* tradition. Meanwhile, pitsos were held during the last six months of 1979 in the prototype areas of Molumong, Nyakosoba and Siloe in order to orient chiefs and farmers in farming systems research concepts and to introduce FSR expatriate advisors to the farming communities. That series of encounters reinforced the growing conviction of the need to organize some form of farmer contact group in each farming community within the three prototype areas. The village agricultural committee form of organization seems to have gained consensus at that time, and such committees (VAC's) were organized and oriented throughout the prototype areas during 1980.

* Basotho are the resident African people
of the Kingdom of Lesotho, whose language is Sesotho.

Further to the introductory pitsos mentioned above, a second series of orientation pitsos was held together with respective chiefs in order to explore the notion of village agricultural committees with members of the farming community. These pitsos were organised by personnel of the extension section of the Research Division who were by that time fully trained in farming systems research philosophy and methodology. Discussions in the villages gained farmer acceptance of the VAC concept.

A third series of pitsos was held, one in each village in order to organize the VAC's. It was decided that villagers/farmers themselves should elect their own committee members based on a criterion of recognized local leadership and known farm ability. The election pitsos were supervised by FSR extension personnel from the Research Division. It was decided that each committee would be made up of eight members consisting of a chairman, vice-chairman, secretary, vice-secretary, treasurer and three representatives. There would be as many VAC's as there were villages in each prototype area. Candidates would be nominated publicly at the pitsos and vote was to be by show of hands with greatest number of votes declared winner of the seat. Each position was elected separately. No candidate was excluded on the basis of age, sex, or for any other motive.

Early in 1980 the village agricultural committees in the three prototype areas were elected. The election pitsos were convened by the respective chiefs and headmen/headwomen and monitored by FSR extension workers. Seven VAC's were elected in Molumong for a total of 56 members. In Nyakosoba, ten VAC's were elected totalling 80 members. Eleven committees were elected in Siloe, adding 88 members and bringing the FSR constituency of VAC members in the prototype areas to 224.

Much of the remainder of 1980 saw an in-depth orientation of VAC members. They were instructed in their individual and collective roles as representatives of the farming communities, partners in farming systems research, providers of feedback to researchers and extension workers, disseminators of information and innovations and teachers. It became obvious that so many farflung committees would need some type of coordinating body in each prototype area and FSR steering committees were elected from among the VAC's in Molumong, Nyakosoba and Siloe*. The steering committees also consist of a chairman, vice-chairman, secretary, vice-secretary and treasurer with the remainder of persons in each areas as members. Since each VAC sends a

* VAC (farmer contact group) members subsequently trained through extension education reside only in FSR prototype areas.

single member to the steering committee, the Molumong committee has seven members, the Nyakosoba committee ten members and the Siloe committee eleven members. At this writing, the VAC's (farmer contract groups) are active and vigorous.

Both VAC and steering committee members must stand for election each year. This reduces the tendency of non-performers or disinterested members to hold offices they do not adequately fulfill. However, the majority of the membership has been consistently re-elected over the years.

An important strength of the VAC structures, which in later years were chartered as agricultural cooperatives in Molumong and Nyakosoba, is their function as sounding boards and feedback organizations which inform and guide agricultural research in Lesotho. This, of course, is in addition to member roles as "farmer researchers, disseminators, and teachers". The establishment of VAC's in Lesotho has been seen as a major breakthrough in engaging farmers in the agricultural development process.

5.2 EXTENSION EDUCATION PROGRAMMES

The next and the prevalent continuing step in the farmer contact group (VAC) process was, and is, extension education*. In order to fulfill expected roles, members not only had to be refreshed periodically on the nature of those roles, but also needed in-depth extension education in agriculture. This agricultural extension derived basically from two sources. The first consisted in the knowledge held by Research Division and FSR practitioners which could contribute to solutions of local problems as identified by farmers themselves. The second had as its basis the results of on-farm farming systems research, concurrently in progress, which provided sound recommended changes in farming practices and products. The intended outcome of the extension education programme among VAC's was the improvement of the productivity, the economics, and the quality of rural life**.

In July and August 1981, extension education programmes were held at the farmers' training centres (FTC's) in Mokhotlong, Matela, and Mohale's Hoek for VAC representatives from Molumong, Nyakosoba and Siloe respectively. The curriculum was standardized as a result of inputs from research and extension officers and consultation with farmers.

* Based on needs stipulated by the Ministry and articulated in the project paper.

** Objectives of FSR/E in Lesotho.

Attendance from the three prototype areas numbered 96 persons.

The curriculum included the nature of adaptive research, attitudes about agronomy, responsibilities of VAC's and their terms of reference, attitudes about marketing and farm management and rural sociology. Technical instruction was given in seed-bed preparation, manuring, inorganic fertilizers, fodder seed, grains and pulses, and recommended varieties of various crops and times of planting (agronomy). Calibration of ox-drawn planters, plows, and other equipment was taught (farm machinery). Instruction and demonstrations were given in seed-bed preparation for vegetable seedlings, early production of cabbage, potato production, direct sowing of vegetable seeds, the compost pit/heap, planting of young fruit trees and pruning of established fruit trees (horticulture). VAC members were likewise instructed in the feeding of the dairy cow (livestock), grazing control regulations and rotational grazing (range), simple record keeping (farm management), and local markets (marketing). This curriculum was felt to be appropriate for addressing identified concerns. All instruction was given in Sesotho by national research and extension officers or interpreted from English instruction

by expatriate advisors (Sefeane, 1981, pp. 1 - 7).

The programme was evaluated to determine the immediate impact of instruction on the 96 participants. With respect to preferred time for farmer extension education programmes, 29 (30,2%) persons indicated summer is best, 28 (29,2%) respondents felt winter most convenient, 36 (27,1%) liked autumn best, while 13 (13,5%) expressed a preference for springtime education programmes. The responses were somewhat expected given the seasonal demands of agriculture. A second question regarding appropriate venue for farmer extension education found 21 respondents (21,9%) favouring home instruction, while 75 (78,1%) indicated satisfaction with the farmers' training centres at that time. VAC members were questioned as to their impressions about the level of instruction. Rating the instructional level as appropriate were 87% of the respondents, while eight percent felt it was inappropriate (too high or too low), according to Sefeane (1981).

Questions were also asked about teaching methods and respondents were instructed to list two preferences. Learning by doing scored 54 marks while listening to instructors was scored 63 times. Group discussions drew 59 scores while

observation was checked only 3 times. As to clarity of instruction, over 90% of the respondents thought the presentations were clear and to the point. A full 100% indicated the programme was relevant to problems on the farms. And, finally some 82% of the participants were happy with board and lodging at the three farmers' training centres (Sefeane, 1981, pp. 7 - 13).

Sefeane concluded that farmers fail to adopt innovations because they lack the appropriate skills; he was prompted to classify farmers as backyard, middle, and commercial/mechanized; and that technology overload is a danger in extension education programmes. He added his comment that farmers are generally intelligent and rational and that recommendations must be compatible, triable, visible and relevant in order to be adopted. His field recommendations at the time centered on a call for FSR trials on cereals and fodder crops. The Sefeane report documented useful information at the input, activities, people involvement, and reaction levels of evidence according to Bennett (1980).

A second farmer (VAC) extension education programme was conducted from March 29 through April 30, 1982, for

committee members from the three prototype areas. Instruction was held at the ministry-operated Mokhotlong, Matela and Mohale's Hoek farmers' training centres. Attendance from the VAC's numbered 98 participants. Content of the curriculum included the responsibilities of VAC's and values clarification. Technical education was provided on seed selection from composites, manures and fertilizers, winter fallowing, weed control, seed viability tests, seed storage, planting operations, and results of a winter wheat experiment (agronomy). Further education was provided on the control of smut in wheat and maize, control of aphids in cabbage, stalk-borer treatment, cutworm control, rodent control and other diseases and pests (plant protection). Ox-drawn equipment was discussed to include plows, yokes, harrows, and planters (farm machinery). Carrots, onions, beetroot, cabbage, tomatoes and spinach received attention as important garden crops, and compost heap making was reviewed (horiculture). Instruction was given in animal science about roughages, concentrates, starting a farm poultry flock, and the implications of the national abattoir for Lesotho's livestock industry (livestock). Animal breeding and culling was also discussed. Finally, common animal diseases were explored such as sheep scab, black quarter, blue tongue and pulpy kidney (veterinary services).

The intensive curriculum was concluded on schedule (Matobo, Sefeane and Youmans, 1982). Farmer contact group (VAC) members' reactions were positive as indicated by the number and quality of the questions raised for discussion. A post instruction evaluation was conducted among 47 VAC members who attended the 1981 instruction. Results showed that committee members understood their roles as those of coordinators among farmers and research officers and advisors to farmers on agricultural activities. They also understood and used organic manures, and had begun to try inorganic fertilizers. Many respondents reported planting barley, oats and lucerne for fodder though others had not attempted to grow fodder crops. Farmers generally recalled recommended varieties of peas, maize, sorghum, wheat and beans and had expended more money to purchase improved seed. Some 20 of the 47 respondents reported having begun to cull livestock. Those who had not, indicated very small livestock numbers. Respondents generally understood and favoured new grazing control regulations (Matobo, Sefeane and Youmans, 1982, pp. 2 - 5).

In addition to the evaluation of the prior year's extension education programme, another instrument was administered in order to evaluate the immediate reaction to the 1982 courses

of instruction. All respondents reported that the discussions on the responsibility of the VAC's had been helpful. Response to questions about agronomy indicated that topics were generally clear and instructional methods appropriate. Exceptions were found among Siloe respondents a few of whom did not understand the instruction in agronomy. Some 56% of the participants reported that they were able to read the instructions for and use pesticides. Others would only use them if somebody read the instructions for them, and a minority stated that it was easier to read instructions than to actually use the chemicals. A majority of the participants were satisfied with what they had been taught in horticulture. Certificates of completion were presented to the participants at ceremonies in their home communities in order to share their accomplishments with the larger society and to identify for that society an important cadre of resource persons (Matobo, Sefeane and Youmans, 1982, pp. 5 - 6). Thus, a comprehensive report on the results of the second year's extension education of VAC members was rendered at the inputs, activities, people involvement, and reaction evidence levels.

An extension education course for Molumong VAC members was held at the Mokhotlong farmers' training centre on March 14

- 18, 1983. Attendance numbered 30 persons. The content of the course was again delivered by national research and extension officers in Sesotho, advised by expatriate FSR practitioners and researchers. It included technical update material on maize, wheat, peas, and beans as developed through the on-farm activities of farming systems research. Land preparation, fertilizer usage and rates, time of planting and recommended seed varieties ensued (agronomy). Production of cabbage, carrots, onions, potatoes, spinach, beetroot, seedbed preparation, fertilizers and manures, time of planting and recommended varieties were also taught with respect to vegetable crops (horticulture). Information was shared on common pests in mountains and plant disease prevention and control (plant protection). Rotational grazing, proper stocking rates, and fodders such as wheat chaff, peas stover and maize stover were discussed (range). Principles of marketing were explored (marketing). The culling and selection of animals, feeds and feeding, common diseases, internal and external parasites, and the livestock importation policy were important subjects for stockmen and graziers (livestock). Topics in rural sociology (rural sociology) concluded the programme. Responses were generally positive (Tsiu, 1983, pp. 1 - 3).

In early 1983 a series of events occurred which radically altered the extension education model for VAC members in terms of venue, structure and strategy. In January and February, three field research centres, constructed under the Farming Systems Research Project, were officially opened in Molumong, Nyakosaba, and Siloe. Each centre consisted of housing for resident research extension assistants and visiting officers, a large shed with storage rooms and water collection tank, and limited land. This development was hailed by Lesotho's Minister of Agriculture as the commencement of "people's universities" where advancements in agriculture and domestic economy could be shared with the people in their own communities. Concurrently, recommended improvements and technologies emerging from FSR on-farm trials work began to multiply. Finally, research extension personnel and the director of research began to explore ways to maximize farmer education while minimizing the cost of same. This was important, anticipating the eventual decline of donor funding. It was then that the change of venue, structure, and strategy for VAC education was conceived (Youmans 1983, pp. 1 - 2).

The change of venue of VAC education from the traditional boarding farmers' training centres in Matela and Mohale's

Hoek to newly opened field research centres at Nyakosoba and Siloe involved both reorientation of VAC members and considerable logistics. Changes from prior room and board arrangements to participant self-financing of transportation and food were somewhat drastic. Considerations were given to such aspects as provision of lorry transportation to and from distant or remote locations and emergency lodging. Maintenance of high attendance rates at educational events and reduction of attrition became primary concerns. Making instruction sufficiently interactive and interesting to assume voluntary attendance presented a singular challenge and represented an abrupt departure from the former "captive audience" situation at the farmers' training centres. An experimental model for the education of VAC members at Nyakosoba and Siloe was designed for testing during April 1983 (Youmans, 1983, pp. 2 - 3).

The components of this model follow. The structure for instruction was to be a short course of three full days duration. Instruction was to be presented in the sheds, equipped with benches, at the field research centres. Chalkboards were to be acquired for graphic illustration. The curriculum was to include orientation by research extension officers, subject matter education in Sesotho by

national research officers, and field trips to crops and horticultural sites for participants. Transportation by lorry was to be provided to participants travelling long distances and also for field trips. Largely, however, participants were to be held responsible for their own transportation. They were also to be instructed to provide their own food and beverages and to attend without interruption for three full days. Tea was to be provided by Research Division/FSR, but participants were to be instructed to bring their own cups. Research extension personnel were to be assigned one Land Rover and were scheduled for a total of five days in each site for the administration of the courses. Research officers were to be enlisted for subject matter presentations, procuring departmental transportation for that task. Opening and closing ceremonies would be officiated by research and FSR personnel and the courses evaluated by research extension and rural sociology officers. Certificate of attendance pitsos were to be scheduled at later dates (Youmans 1983, pp. 3 - 4).

The short course for Nyakosoba VAC members was held on April 12 - 14, 1983. Since there were no restrictions on space or facilities, all VAC members in the prototype area were

invited and encouraged to attend. The short course for Siloe was held on April 19 - 21, 1983. Both courses were held at the RD/FSR Field Research Centres which had been constructed with USAID funds through the Farming Systems Research Project. Participants in both cases brought their own food and beverages and supplied their own cups for tea. In large part, participants came and went by their own means although the FSR truck did in both venues provide transportation to remote areas as well as for the field trips. Education at both sites included orientation, topics in agronomy, agronomy field trips, topics in horticulture, horticulture field trips, farm machinery, calibration of ox-drawn planters, topics in livestock and plant protection.

The attendance at Nyakosoba numbered 61 persons who attended consistently, excepting the untimely illness of one lady. The attendance at Siloe was a consistent 97 persons, with five additional participants the second day and two additional participants the third day. This participation represented a considerable increase in attendance over the 28 and 38 attendance figures of 1982 courses at Matela and Mohales Hoek FTC's. The participants were highly interactive in educational activities both at the FRC sheds and during the field trips.

As seen above, the change of educational strategy and venue had a positive effect on attendance. It was, however, not conclusive since attendance might also have increased at a five-day course at the FTC's if funding and space permitted extending that opportunity to more people. Evidence indicated that participants had attended several and varied kinds of educational activities over recent years.

Of 140 respondents to the evaluative instrument, 114 requested more instruction in agronomy, 92 wanted more knowledge about horticulture, 73 checked plant protection as a continued training need and 67 indicated a need for more education in livestock matters*.

Regarding length of course, 63 participants (45%) preferred a five-day course while 27 persons (19%) were content with the three-day option. Items liked about the three-day short course at the field research centre were many and varied. Included were "such comments as relevant topics, good conduct, impressive teaching methods, good course content, good lecturers and adequate transportation back-up. Others were nearness of centre to home, knowledge gained to be shared, location of course at research centres, working

* Constitutes self assessment of continuing needs.

together and sharing with different resource specialists. Still others commented favourably about punctuality, lecturers' relationship with research extension assistant, exchange of ideas opportunity, hospitality, good course organization and breadth of advice. Finally, other participants made positive statements about presence of chiefs, running of course, eagerness to learn among participants, high course standards, right number of days allocated for the course, getting to know one another, learning to adapt to new course strategy and, last, that participants were not forced to attend.

Items not liked were fewer and included course was too short, time per topic not sufficient, inadequate toilets, daily commutation to centre a problem, travelling conditions a hardship, and absence of food provision a constraint.

Respecting course content to be taught in future farmer educational events, 40 participants (29%) wanted continued education in agronomy, 22 persons (16%) felt a need for training in poultry, 19 participants (14%) wanted more education about oxdrawn equipment, 15 (11%) indicated a need for more knowledge in horticulture and 14 (10%) wanted to learn more about livestock/animal diseases (Youmans 1983, pp. 4 - 6)*.

* Self assessment continuing needs.

This account and subsequent evaluation seem to have dealt with specific programme results at the inputs, activities, people involvement, and reaction evidence levels.

At the urging of Lesotho's Minister of Agriculture, the farmer contact groups (17 village agricultural committees) in Molumong and Nyakosoba were organized and chartered as agricultural cooperatives during 1984. This in no way adversely affected their roles as farmer contact groups in the context of farming systems research. It did open up some opportunities for credit, loans, and group purchasing and marketing. The training and organizational activity involved in the transition was executed by Ministry of Cooperatives and Rural Development personnel in cooperation with research extension officers.

By the time extension education events were scheduled for 1984, the Nyakosoba VAC's were operating under a central cooperative framework. Short courses were held for those VAC's on September 4 - 7, 1984 and for the Siloe VAC's on September 18 - 21, 1987. Joint attendance was 87 persons. Curricula centered on topics in horticulture, agronomy, plant protection, fodder production, demonstration of Areana ox-drawn machinery, and calibration of same.

A "spin-off" extension education programme of FSR in Lesotho is the on-going nutrition education process. Women farmers who were successful and enthused with home garden activities of farming systems research in Nyakosoba expressed a need to learn methods of storing some of their garden produce and of preparing nutritious meals for their families using home grown vegetables*. The extension research section of the Research Division responded to this expressed need by jointly organizing and giving a course together with the nutrition section of the ministry at Nyakosoba. This course was organized around the themes of production, preservation and preparation of home garden grown food. It targeted 100 women who had been involved in home garden education through farming systems research and was held at the Nyakosoba field research centre from March 1 - 4, 1983 (Ramakhula, 1983, pp. 1 - 3).

The content of this course, according to Ramakhula, (1983, p.3) centered principally on nutrition. Methods of food preservation were taught including food drying in simple home constructed food driers and hot and cold air exclusion packing methods. On the food preparation side, simple nutritious ways of cooking vegetables, preparing salads, and feeding the family were taught. Despite inclement weather, 72 of the 100 targeted women attended the course regularly.

* Another objective of FSR/E in Lesotho.

Ramakhula reports that women farmers' reaction to this course was most positive (1983, p.3). They were highly interactive, worked long hours, and compiled home cookery recipe books. They also organized a cookery club which agreed to meet monthly with the district nutritionist for lessons on food and family nutrition.

The extension research section of the Research Division also addressed the need for home economics and management instruction voiced by women farmers by coordinating with home economics assistants in Mohale's Hoek and Maseru districts in conducting home economics courses at Siloe from the 20 - 24 February, 1984 and at Nyakosoba from 7 - 11 May, 1984. A total of 92 women consistently attended these courses, according to Ramakhula (1984, p.1.), and numbered many teenage girls in addition to women farmers. Predicated on a realization that women's roles in development are often ignored, the course objectives addressed the need for women to produce and utilize food for their families, the need to store perishable food and avoid waste, and the need for home management skills to include nutrition, community resources, home improvements, and family care and health. Based on such objectives, the course content included the use and preparation of home-grown foods, the three basic food groups, use of left-over foods, and improvement of

traditional dishes. All foods used in this instruction were home-grown and provided by the women farmers. The women were also taught how to prevent waste and spoilage of perishable food through use of simple home-made coolers. They were also trained in solar drying of fruits and vegetables. Further course content included programming of housework, budgeting, money management, and family health as influenced by proper nutrition, clean drinking water, adequate ventilation, exercise, and eating habits. Making of family clothing through sewing, knitting and crocheting skills were taught and home remedies were reviewed for common colds, tired feet and chapped hands (Ramakhula, 1984, pp. 1 - 3).

Ramakhula reports (pp. 3 - 4) that reactions to the instruction were very positive as demonstrated by the frequency and variety of questions and requests for advice. Since courses of five days each are not sufficient to address the magnitude of this need, it is significant that good linkages were established between women farmers and home economics assistants in the districts.

Another indicator of positive reaction was the women's willingness to supply all the home-grown food for the courses and to contribute to the purchase of supplementary items.

The above commentary documents the outcomes of home economics instruction by the extension research section and the home economics assistants and nutrition section of the ministry. It does so at the inputs, activities, people involvement, and reactions levels of evidence and describes another important linkage between farming systems research and farmers.

Also in 1983 - 1984, farmers field days were held in Siloe (livestock), Nyakosoba (crops), and Molumong (crops). Altogether 140 farmers attended those field days where agricultural subjects were observed and discussed.

Since 1981, research extension personnel have prepared and broadcast agricultural radio programmes over Radio Lesotho each Saturday morning. That extension education programme was in response to indications in the FSR baseline survey (Butler, 1982) that farmers in the prototype areas depended importantly on the radio for information about agriculture (Trail, 1982, pp. 14 - 21). The Research Division of the Ministry of Agriculture, in the context of the FSR extension education effort, consistently produced 52 radio programmes annually.

The above is an account of the type, frequency, and content of extension education programmes in the FSR context from 1979 through 1984. The programmes are described and evaluation results reported as they apply to inputs,

activities, people involvement, and reactions levels of evidence as identified by Bennett (1980).

5.3 THE RESEARCH PROBLEM

The research problem associated with the impacts of farming systems research extension education programmes on members of farmer contact groups (village agricultural committees/coops) centres on the vital need to learn of tentative effects and potential benefits of those programmes beyond the rather soft perceptions about input, activities, people involvement and reactions. In the context of FSR philosophy and practice, it is necessary to determine the kinds and extent of perceived behaviour changes among the VAC membership in terms of what has been learned and retained in both the knowledge and skills realms and how that is associated with attitudes and aspirations. Further, since the FSR strategy is ultimately results oriented, the degree of practice change among the clientele needs to be determined and where possible, the real benefits (end results) ascertained.

Thus the objective of this research is to determine the perceived impacts of the extension education programmes during 1979 - 1984 of farming systems research in Lesotho on members of farmer contact groups (village agricultural committees/coops) as those impacts may be ascertained in the areas of knowledge, attitudes, skills and aspirations change; reported practice change and results or real benefits to farm families as felt by the farmers themselves.

5.4 METHODOLOGY

As was explained in Chapter 1, the methodology selected for the accomplishment of the research task at hand is the reflective appraisal of programmes (RAP) strategy. This is an approach developed by Claude F Bennett and associates (1982) for the study of clientele - perceived results of extension education programmes.

Bennett has developed a state of the art method of appraising extension programme impacts through reflective perceptions of participants as related to a hierarchy of evidence of learning levels. Included in the hierarchy are (1) inputs, (2) activities, (3) people involvement, (4) reactions (5) KASA* change, (6) practice change, and (7) end results. The first four of these seven levels of evidence (Bennett 1980, pp. 4 - 12) have been determined in the preliminary account, description, and evaluative results of the programme in question. Analysis of the KASA, practice change, and end results levels must obviously be sought in order to add strength to the evidence of the programme impacts and to complete the evaluative profile of the educational intervention (Bennett, 1977, pp. 11 - 14).

* The KASA acronym denotes changes in knowledge, attitudes, skills, and aspirations through education.

The RAP methodology is eminently suited, indeed has been specifically developed for, the collection and evaluation of data at all seven of such evidence levels and specifically aims toward seeking information from as high a level on the evidence hierarchy as possible. As explained earlier, RAP seeks reflective evidence through interview questionnaires about the results of extension education programmes as perceived by the participants in those same programmes. RAP freely admits that the data are reflective as well as subjective, but argues that extension education is a reflective phenomenon and makes no apology for its subjectivist posture. It does warn against bias, distortion, and other influences and provides methods for minimizing their impacts.

RAP uses a standardized set of interview questions which can be adapted to any programme to be evaluated*. Results can be important for decision-makers in assessing new programmes, modifying and improving on-going programmes, accounting for activities within and outside the organization, and responding to specific objectives such as farming systems research. The RAP methodology can be used by practitioners (extension workers) themselves in evaluating programmes and is not critically constrained by absence of baseline data or

* RAP has been used by Technoserve personnel in evaluating in-service training programmes of farm co-operatives of El Castaño Project in El Salvador and in Peru.

control group populations. In RAP, the levels of evidence are standardized evaluative plateaus and are easily understood by colleagues and administrators familiar with the methodology.

Since RAP is a subjective research method, factors which may tend to bias or "soften" data must be countered by such practices as sharing the interview task, clarification of the scope of study to interviewees, use of open-end probe questions to "tighten up" positive but vague responses, and reviewing and describing programmes crisply with interviewees to reduce memory lapse.

RAP also offers some alternative methods for collecting evidence on programme results. They are (1) interviews, (2) questionnaires, (3) expert opinion, (4) observation, and (5) analysis of documents. Methods 4 and 5 have and will be liberally used in reporting results of the first four evidence levels. Methods 1 and 2 will find ample application in the data collection and compilation phase of the evaluative exercise for KASA, practice change, and end results evidence levels. Method 3 will come into play in the summaries of findings in Chapters 5 , 6 and 7 and importantly in Chapter 8.

5.5 DATA COLLECTION

Data on the influence of FSR extension programmes on members of farmer contact groups in Lesotho were collected by means of carefully designed interview questionnaires. Referring to the RAP methodology guide (Bennett, 1982, pp. 9 - 13,) it was decided to seek and collect data at evidence levels 5, 6 and 7, namely KASA change, practice change and end result. It was felt that the programmes to be studied had taken place over a time span long enough to permit desired change, and even end results, but not too long so as to be severely hampered by memory lapse*.

The interview questionnaire contained a brief introduction designed to inform the interviewee of its purpose and scope. A block of biographical data questions followed with the purpose of developing a social/educational/occupational profile for the respondents. The extension educational events together with dates and venues were listed briefly in order to identify for respondents dates, venues, specific curriculae and events. The cumulative content of the farmer contact group education programme was listed so that it might be reviewed with each respondent to refresh recall potential. The field days were then enumerated and

* It must be remembered that KASA change may be influenced by extraneous educational experience, and practice change and end results by economic and environmental factors, whether or not thus perceived.

described along with venues and dates. Finally, the radio programmes were described explaining the general content and time of broadcast.

The programme description was validated with the respondent by means of a single validation question. A reaction question was asked in order to reconfirm or contest earlier evaluation outcomes through the reaction evidence level. Two questions on extension methods and venue were asked in order to determine preferences among respondents. Specific standardized but modifiable questions were then asked about every general subject matter content area in conjunction with all four KASA change components, practice change, and end results. The responses could be entered on a matrix in numerical values which corresponded to qualitative values of a Likert scale. Open-end probe questions were provided for in standardized question form, but at the discretion of the interviewer in order to confirm or gain information about positive, negative, or questionable responses. Closed-end probe questions followed in order to construct an agricultural profile for the respondents. Lastly, respondents were asked about end results (real benefits) associated specifically with participation in the FSR extension education programmes. Two final questions on

constraints and recommendations were designed to reap first-hand feedback on programme outcomes from involved participants.

A single female Mosotho colleague* of the principal researcher was selected to conduct all the interviews among members of the farmer contact groups (village agricultural committees/coops). This research assistant knew all of the respondents personally since she had participated in the several extension education events, including organizational and monitoring work among the committees, and was known to be highly respected by them. She was thoroughly trained in RAP methodology by the principal researcher and was asked to review the English draft of the interview instrument (questionnaire). After minor adjustments, the research assistant worked closely with qualified colleagues to translate the instrument into Sesotho and test it among colleagues against the English instrument for accuracy of intent and content. She was instructed to consider her initial interviews as tentative until she was certain the questions were fully understood and were eliciting uniform responses, thus addressing the field testing question with no loss of time. Any misunderstanding or confusion was to be reported. There was none of significance.

* C M Ramakhula holds a Certificate in Agriculture from Lesotho Agricultural College and a Diploma from National Teacher Training College. She was trained in extension by USDA at University of Missouri and in the RAP methodology by the principal researcher. She is currently studying for the B.Sc. in general agriculture at Washington State University.

The lists of members of the farmer contact groups (village agricultural committees/coops) known to have attended one or more extension education events were assembled and every third name selected for interview. These attendance lists were developed as farmers randomly arrived for the courses, thus satisfying the principle of randomness. Of the total VAC membership of 224 persons, 194 had attended organized training events. Of the 194, a sample of 64 was selected by ticking every third name on the lists. Of the 64 persons engaged for interview, 54 viable questionnaires were returned, an 84% sample response and a 28% population response. The research assistant was instructed to attempt to reach each interviewee a maximum of three times. Reports sustain that persons who were not reached had moved away, were working in South Africa or were simply unavailable. Thus, the sample of 54 persons forms the basis of subsequent data presentation and analysis.

•

The research assistant conducted the interviews face-to-face in the field in Sesotho at the respondents' farms and villages in late 1984 and early 1985. Since she knew all the participants personally and had been a regular extension worker carrying out her work among them, there was little

difficulty establishing rapport and gaining access and trust. These face-to-face encounters were most valuable since they afforded a direct opportunity to explain in Sesotho any question not fully understood. Choice of a single interviewer avoided distortion in the interviewing technique, assuring uniformity of style. The research assistant filled out the questionnaires herself in Sesotho noting respondents' comments carefully. This was done to assure consistency since numerous respondents are unused to dealing with written forms, and a few could not write. Responses to open end probing questions were condensed by the research assistant in the interest of subsequent compilation and tabulation. The data were then translated into English and transferred to fresh English forms for the usefulness and benefit of the primary researcher. In the above manner, the 54 sets of research data were gathered and presented for further analysis.

5.6 DATA PRESENTATION AND ANALYSIS

As in Bembridge, Steyn and Williams (1983, pp. 15, 137) in their comprehensive evaluation of the KwaZulu Extension Service, and consistent with the general recommendations of Bennett (1976, 1980 and 1982), the data gathered from the

farmer contact group sample were checked and coded for computer analysis. A second research assistant was engaged for this task. The data were clear and reflective of farmer perceptions. Thus, (like the KwaZulu study) no further sophisticated statistically analysis was considered necessary for reporting the findings in this chapter.

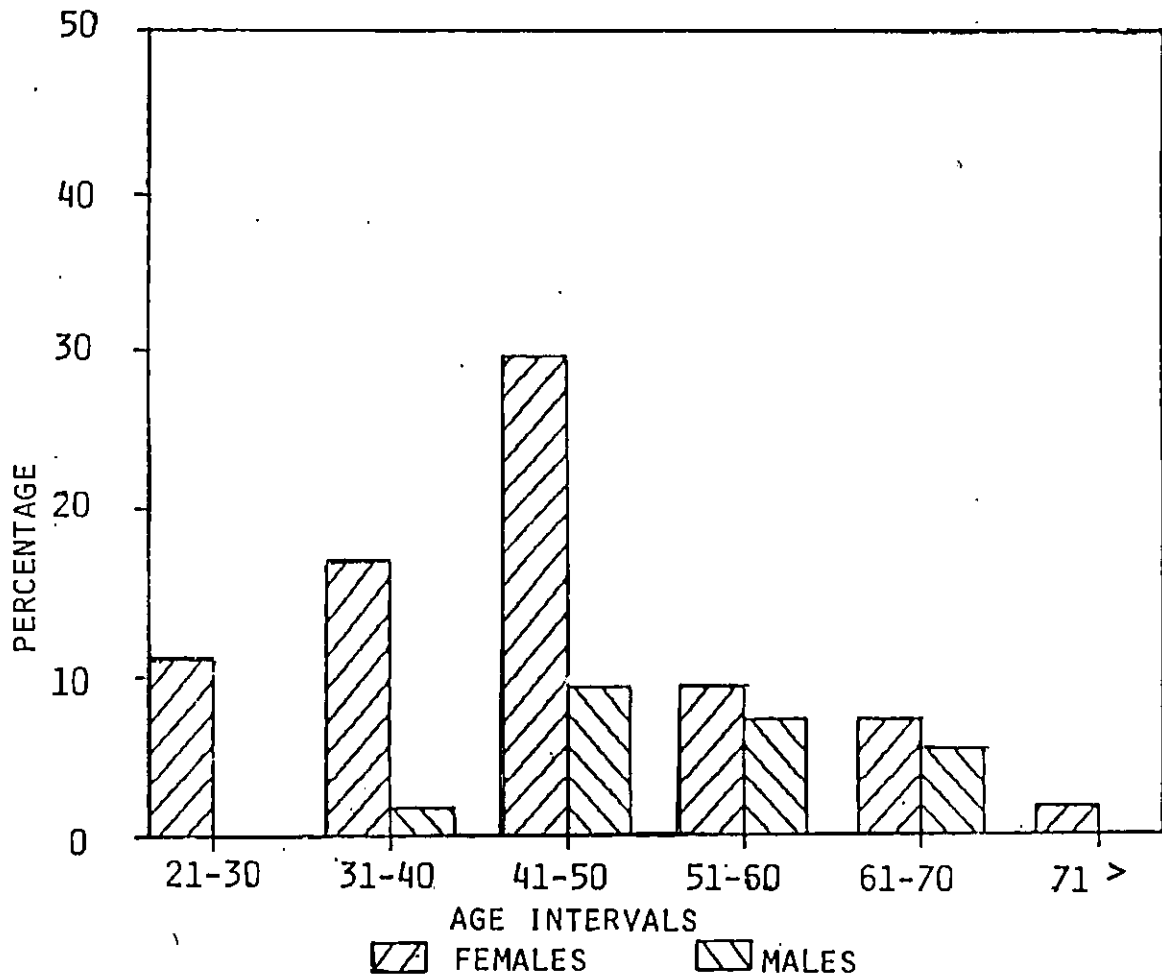
5.6.1. Biographical data

a. Age and sex

A computer assisted analysis showed the age range for the 54 respondents (considered here to be a sufficiently large sample size to extend to the entire population) was 21 - 71 years; the mean age was 46,6 years. Analyzed by age intervals; 7,4% were found in the 21 - 30 group, 18,5% in that of 31 - 40 years, 33,3% were in the 41 - 50 interval, 25,9% were from ages 51 - 60, 11,1% were between 61 - 70 years of age, and 3,7% was 71 years or older.

When the data were analyzed for the sex of the sample respondents, 41 (75,9%) were women and 13 (24,1%) were men. This finding is likewise expected to extend to all members of the farmer contact groups. Seen in this context of sex, the female age ranged from 21 - 71 (mean 44,2%) The range for males was from 39 - 70 years (mean 54,2%). These data can be seen graphically on Figure 5.1. They show dramatically the virtual absence of men in farmer contact

FIGURE 5.1: AGE DISTRIBUTION OF FEMALE AND MALE RESPONDENTS FROM FSR FARMER CONTACT GROUPS, LESOTHO, 1985



groups between the ages of 21 and 40, as well as the marked predominance of women in the groups through age 50, and their consistent majority throughout all age groups. This configuration is suspected for Lesotho's farming population at large and is thought to be related to the reported 208000 miners said to be in the Republic of South Africa. Since all 54 respondents were either married or widowed, it also justifies an alertness with respect to content and context of extension education programme design.

b. Family size

The 54 respondents had 197 children (mean 3,65). Since it has already been seen that women as young as 21 may farm and that men from 21 - 40 years of age are absent from the farms, children's ages were not compiled. They are available in the raw data.

c. Prototype area distribution

Respondents' villages of residence were not found to be relevant to this study. Their residence according to prototype area is, however, of interest. Of all respondents, 6 women and 3 men were from Molumong, 18 women and 3 men were from Nyakosoba, and 17 women and 7 men were from Siloe. Totals are Molumong 9, Nyakosoba 21, and Siloe 24. These data are found in Table 5.1.

TABLE 5.1: BIOGRAPHICAL DATA ON MEMBERS OF FARMER CONTACT GROUPS, LESOTHO, 1985

BIO. DATA							
RESP. NO	AGE	SEX	AREA	YRS/FRM	EDUC(Std)	MIG/RSA	TYPE WORK
1	42	Female	Nyakosoba	15	5	1	M
2	48			37	2	1	M
3	62			14	7	6	M
4	36			6	6	0	
5	47			24	6	1	M
6	42			11	5	1	M
7	59			25	1	0	
8	42				1	3	M
9	30			5	6	1	M
10	71			30	1	0	
11	50			20	6	3	M
12	50			20	3	1	M
13	55			15		5	M
14	31			5	4	1	M
15	43			10	5	1	M
16	50			20	5	1	M
17	45			5	3	1	M
18	40			13	3	1	
19	32	Female	Siloe	4	4	3	M
20	27			7	7	2	M
21	40			12	4	0	
22	55			3	6	2	M
23	28			2	7	1	M
24	48			14	3	1	M
25	48			25	1	2	M
26	69			4	2	0	
27	52			10	2	1	M
28	39			0	4	4	M
29	56			31	5	1	M
30	34			6	3	8	M
31	42			12	3	2	M
32	30			2	7	4	M
33	35			5	4	1	M
34	48			5	6	4	M
35	43			12	7	0	
36	21	Female	Molumong	5	7	1	M
37	45			27	6	0	
38	31			3	4	1	M
39	62			36	4	3	M
40	24			6	6	6	M
41	62			36	4	3	M
42	55	Male	Nyakosoba	39	0	1	M
43	50			25	0	1	M
44	50			20	0	2	M
45	51			20	2	0	
46	59	Male	Molumong	12	1	2	M
47	65			35	0	1	M
48	49			14	0	0	
49	39			3	5	0	
50	64			46	5	4	M
51	48			4	1	3	M
52	47	Male	Siloe	12	3	0	
53	70			20	1	2	M
54	58			12	5	1	M

d. Farming experience

The respondents reported total farming experience of 804 person/years (mean 14,9 years/ respondent). The range in farming experience was 0-46 years. These data are also in Table 5.1.

These data related to age and the viability of farmer contact groups* as an innovations diffusion network will become evident later in the study.

e. Formal education

All but 6 respondents had attended school. Of these 6,5% reported no schooling and 4,6% did not respond. The 48 (88,9%) who had attended school were in a range from Standard 1 - Standard 7 (mean standard "4,2"). The educational mean for the total sample was a standard "3,8". These data are in Table 5.1.

*The terms "farmer contact groups", "village agricultural committees", and (later on) "farmer cooperatives" are synonymous in this study.

f. Migrant labour

Of the total sample, 43 (79,6%) persons said that one or more members of their immediate families work in the Republic of South Africa. Those migrants ranged from 1 - 8 persons (mean 2,02), and totalled 87 workers. The migrant labour mean for the entire sample was 1,61 persons per household. In the cases of migrant labour reported, the migrants' occupation was overwhelmingly mining. Only 2 migrant farm labourers and 2 domestic servants were reported. Migrant labour data are in Table 5.1.

5.6.2 Farm characteristics

Most of the farm characteristics reported here are based on 53 respondents since one person declined to supply farm data. Accurate farm size could not be determined since many respondents reckoned size in number of "fields" while others reported measurements in acres.

a. Field crops

Respondents said they grew maize, sorghum, wheat, beans and peas on their land. These crops were reported roughly in that order.

b. Farm machinery

Farm machinery was owned by 29 respondents (54,7%). Of those owning machinery the most frequent implement reported was the plow. The numbers of cultivators and planters were comparable. Harrows were rare. Presumably all machinery reported is ox-drawn. One person owned a petrol engine pump for irrigation.

c. Horticulture

Horticulture crops were somewhat more varied. Those reported included cabbage, tomatoes, beetroot, carrots, radish, potatoes, pumpkins, spinach, onions and lettuce. It is significant that 50 of 53 respondents (94,3%) grew home gardens. This finding seems positively related to FSR horticultural research and extension education programmes. Likewise, 47 of 53 (88,7%) participated in communal gardens. While the communal garden movement is officially the province of the Ministry of Cooperatives and Rural Development, there is reason to believe that intense activity by FSR related Peace Corps volunteers and research extension assistants in Siloe and Molumong is associated with this significant accomplishment.

d. Weeding and pest control

All 53 respondents to farm characteristics questions said they weed their crops and gardens. Likewise, all 53 reported utilizing the hand hoe for this task. Only 1 person made use of a cultivator for weeding although he also used the hand hoe. No chemical herbicide use was reported. In the realm of insect and plant disease control, 36 persons (67,9%) reported carrying out this task. Although certainly weeding and pest control activities were not uncommon in Lesotho prior to 1979, it is felt that these elevated percentages reflect efforts by FSR and research agronomy and plant protection personnel through extension education programmes.

e. Animal ownership

Ownership of range animals showed 26 respondents (49,1%) owning sheep with a mean of 13 animals. Cattle were owned by 32 (60,4%) persons averaging 6 animals per owner. Other animal ownership was reported by 39 respondents (73,6%). A mean of 6 other animals per owner included goats, horses and donkeys.

Home-based animals included milk cows, swine and poultry. Mean milk cow ownership was 3 animals among 23 respondents (43,4%). The 20 persons (37,7%) who kept swine owned a mean of 2 pigs each. Poultry were kept by 43 respondents (81,1%) who owned a mean 10 birds apiece. Presumably these were mainly indigenous chickens.

f. Farm labour

In 49 cases (92,5%) members of respondents' families worked on their farms, yielding a mean of 3 family members per household. Yet 23 respondents (43,4%) hired outside farm labour during the year. The incidence of herd boys among respondent households numbered 29 (54,7%) of whom 19 (65,5%) were family members and 10 (34,5%) were non-members.

g. Marketing

Of 53 respondents, 25 (47,2%) produced more goods than their families and animals consumed. Among such goods were beans, maize, wheat, peas, sorghum, cabbage, carrots and potatoes. These goods were actively marketed. Most farmers sold goods locally for cash. Bartering other goods for wheat was done by 2 persons, and 1 marketed surpluses through a local trader.

h. Farm records

Members of farmer contact groups among the 53 respondents who kept farm records were 7 (13,2%). No extension education effect is inferred here since the farm records programme is a different FSR activity.

5.6.3 Extension education indicators

Respondents were asked to provide certain feedback indicators in order to guide current and future extension education programme planning.

a. Farmer field day attendance

In addition to attendance at farmer education courses given, respondents were asked if they had attended one of the three farmer field days held in the prototype areas during the scope of this study. Attending these field days were 45 of 54 persons representing an 83,3% positive response to this extension method. There were 2 non-responses to the question, and 7 persons (13%) did not attend farmer field days.

b. Radio programmes

The sample farmers were asked if they regularly listened to the FSR radio programme broadcast by the Research Division each Saturday morning. Radio programmes were regularly or frequently heard by 41 of 54 persons, a 75,9% positive response to this extension method. Radio programmes were not heard by 13 persons (24,1%). Those who qualified a negative response said they did not own a radio, or that the programmes were too early in the morning.

Respondents who said they listened to the radio programmes were further asked if they liked to learn by radio. All respondents replied positively, provisionally reinforcing the extension potential in radio programming.

c. Validation of content recall

As extension education programmes were described to respondents during the interview process, a function designed to stimulate recall (Bennett, 1982); they were asked to indicate the accuracy of the programme description with respect to content. All 54 respondents said the descriptions were accurate so far as they knew, the maximum, response on a four-point Likert scale. Although the lack of

variability in the response may raise some question, the utility of that aspect of the questionnaire/interview process is nonetheless confirmed.

d. Reaction level

On the occasion of the personal interview, respondents were asked to what extent the extension education activities met their expectations at the time. Without exception, they replied that they had done so to a great extent, again a maximum response on four-point Likert scale (Bennett, 1982). Regardless of some expected bias, the response still speaks well for suggestive programme effectiveness at the reactions evidence level (Bennett, 1980).

e. Methods preference

Since the extension education programmes from 1979 - 1984 incorporated a number of extension methods including illustrated talks, demonstrations, field trip/field days, and combination of these; respondents were asked to indicate their method preferences. The illustrative talk was preferred by 3 persons (5%). The demonstration was preferred by 1 person (2%). Field trip/field days was indicated by 1 person (2%). A combination of methods was preferred by 47 respondents (87%), while 2 respondents (4%)

did not reply. Since it has already been seen that radio programming was also widely accepted, indications are that an integrated, multi-sensory approach to extension education in Lesotho is the course of action preferred by the farmers themselves. This finding is consistent with farming systems research and extension dynamics as they have evolved.

f. Venue of extension education

Since early extension education programmes among members of farmer contact groups had taken place at the farmer training centres (FTCs) in Mokhotlong, Matela and Mohale's Hoek, and since they had abruptly been shifted to the field research centres (FRCs) at Molumong, Nyakosoba and Siloe upon the completion of those centres, it became necessary to determine the net effect of that change of venue. Thus, respondents were asked to indicate their preferences. Farmer training centres were preferred by 4 persons (7.4%). Field research centres were preferred by 50 persons (92.6%).

The overwhelming preference for the field research centres was qualified by three personal reasons on the part of the

farmers. The desirability of being able to attend family, animals and other farm matters each day before and after educational activities was stated by 42 respondents (84%). That more farmers could attend courses at field research centres was indicated by 6 respondents (11,1%), and that too much farmer assistance money had to be spent at farmer training centres was felt by 2 persons (3,7%). These reasons centered predominantly on concern for daily welfare of family and farm, concern that extension education reach more members of the farming community, and a sense of stewardship for public expenditure.

Those 4 persons who preferred the farmer training centres, (7,4%), gave as reasons the orderliness of classes and absence of confusion (3,7%), to see new places and work at the FTC (1,9%), and ability to listen and study more effectively (1,9%).

While this finding may not be good news for proponents of farmer education at the farmer training centres, it is nonetheless apparently clear that farmers themselves (92,6%) prefer extension education which takes place near their places of residence and do not want to be away from home overnight.

This finding, in addition to the vote of confidence for radio, speaks currently for localized extension programmes.

This is consistent with the site - specific tenet of farming systems research and with FSR extension education as it has evolved. It also compliments the wisdom of the former director of agricultural research and current director of technical services in Lesotho who actively promoted the change of venue in question.

g. Recommendations by farmer contact group (VAC) members

It is always a principle with FSR extension personnel to elicit feedback and recommendations from farmers on extension education programmes with a view toward improving programme effectiveness. Thus, all members of farmer contact groups who were interviewed were asked what suggestions they had for the improvement of the Research Division's farmer education programmes.

Tabulation shows that 44 persons (81,5%) had no suggestions or recommendations. This is seen as a socio-cultural phenomenon whose roots are outside the scope of this study. However, 10 persons (18,5%) gave recommendations which may be significant despite their infrequency. There were two suggestions that extension courses be brought to the village level since even the field research centre was distant from

some respondents' houses. There was one recommendation each that more education be given on village agricultural committee (farmer contact group) responsibilities, animal management and range, plant protection, agronomy and dairy science. One person felt there should be more practicals in farmer education, and one lodged a legitimate, if perhaps misdirected request for a local inputs depot. A single respondent preferred lunch and snacks to tea!

5.6.4 KASA and practice change results*

Since the impacts of extension education programmes are ultimately measured in terms of behavioural change among clients, it is in order to analyze the data gathered from the 54-person sample of members of farmer contact groups on reflective self perceived changes in their own knowledge, attitudes, skills, aspirations and agricultural practices related to their involvement in farming systems research extension programmes.

a. KASA change

Members of the sample responded to standardized questions about the changes in knowledge, attitudes, skills and

* Care is to be exercised in interpreting results because of potential influence of extraneous factors.

aspirations (KASA), and practice in the areas of agronomy, horticulture, plant protection, farm machinery, and animal and range management perceived as related to participation in extension programmes. Their responses were on a standardized response Likert scale (Bennett, 1982) as follows:

- to a great extent (3)
- to a fair extent (2)
- to a slight extent (1)
- not at all (0)
- other (2)

The values in parentheses were used by the research assistant (interviewer) to encode and record the responses onto a numerical matrix. The matrix values were then coded and entered into the computer by a second research assistant for compilation and analysis. The data to be discussed are the results of this process, and may be seen on Table 5.2

The KASA change values are retained in separate change components in order to insure the distinguishability of response value categories. Thus, one is able to determine from the data the percentage and number of respondents who reported gaining knowledge to a great extent (3) in agronomy as

TABLE 5.2: TOTAL CHANGES IN KNOWLEDGE, ATTITUDE, SKILLS, ASPIRATIONS AND PRACTICE CHANGE BY 54 RESPONDENTS IN AGRONOMY, HORTICULTURE, PLANT PROTECTION, FARM MACHINERY AND ANIMAL AND RANGE MANAGEMENT, AS A RESULT OF EXTENSION EDUCATION PROGRAMMES 1979 - 1984, LESOTHO, 1985

		NUMBER OF RESPONDENTS					TOTAL RESP	PERCENTAGES				
		Z	0	3	2	1		Z	0	3	2	1
TOTAL AGR	KNOW	2	0	46	6	0	54	4	0	85	11	0
	ATT	2	0	46	6	0	54	4	0	85	11	0
	SKILL	2	0	40	12	0	54	4	0	74	22	0
	ASP	2	0	48	4	0	54	4	0	89	7	0
	PR/CH	2	6	33	10	3	54	4	11	61	19	6
TOTAL HORT	KNOW	1	0	48	5	0	54	2	0	89	9	0
	ATT	1	0	50	3	0	54	2	0	93	6	0
	SKILL	2	0	39	13	0	54	4	0	72	24	0
	ASP	1	0	50	3	0	54	2	0	93	6	0
	PR/CH	1	9	30	11	3	54	2	17	56	20	6
TOTAL PL/PROT	KNOW	2	0	43	7	2	54	4	0	80	13	4
	ATT	1	0	46	6	1	54	2	0	85	11	2
	SKILL	2	1	24	9	18	54	4	2	44	17	33
	ASP	1	2	41	7	3	54	2	4	76	13	6
	PR/CH	1	17	13	13	10	54	2	31	24	24	19
TOTAL FRM/NC	KNOW	4	1	41	7	1	54	7	2	76	13	2
	ATT	2	1	44	6	1	54	4	2	81	11	2
	SKILL	4	0	23	13	14	54	7	0	43	24	26
	ASP	2	1	46	4	1	54	4	2	85	7	2
	PR/CH	2	11	13	20	8	54	4	20	24	37	15
TOTAL ANI/NGT	KNOW	3	0	44	7	0	54	6	0	81	13	0
	ATT	2	0	46	6	0	54	4	0	85	11	0
	SKILL	3	0	26	17	8	54	6	0	48	31	15
	ASP	2	1	44	6	1	54	4	2	81	11	2
	PR/CH	2	31	2	10	9	54	4	57	4	19	17

Z = OTHER

0 = NOT AT ALL

3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

1 = TO A SLIGHT EXTENT

a result of their participation in extension education programmes during the period under study. Likewise, one can easily see the number and percentage of those who said they learned plant protection skills to a slight extent (1), or those who experienced no practice change (0) in animal and range management.

Generally, the data tentatively support indication of positive KASA changes, tending provisionally toward change to a great extent in all technical agriculture subject matters as a result of having participated in farming systems research extension education programmes from 1979 - 1984, as perceived by the members of farmer contact groups themselves.

b. Practice change

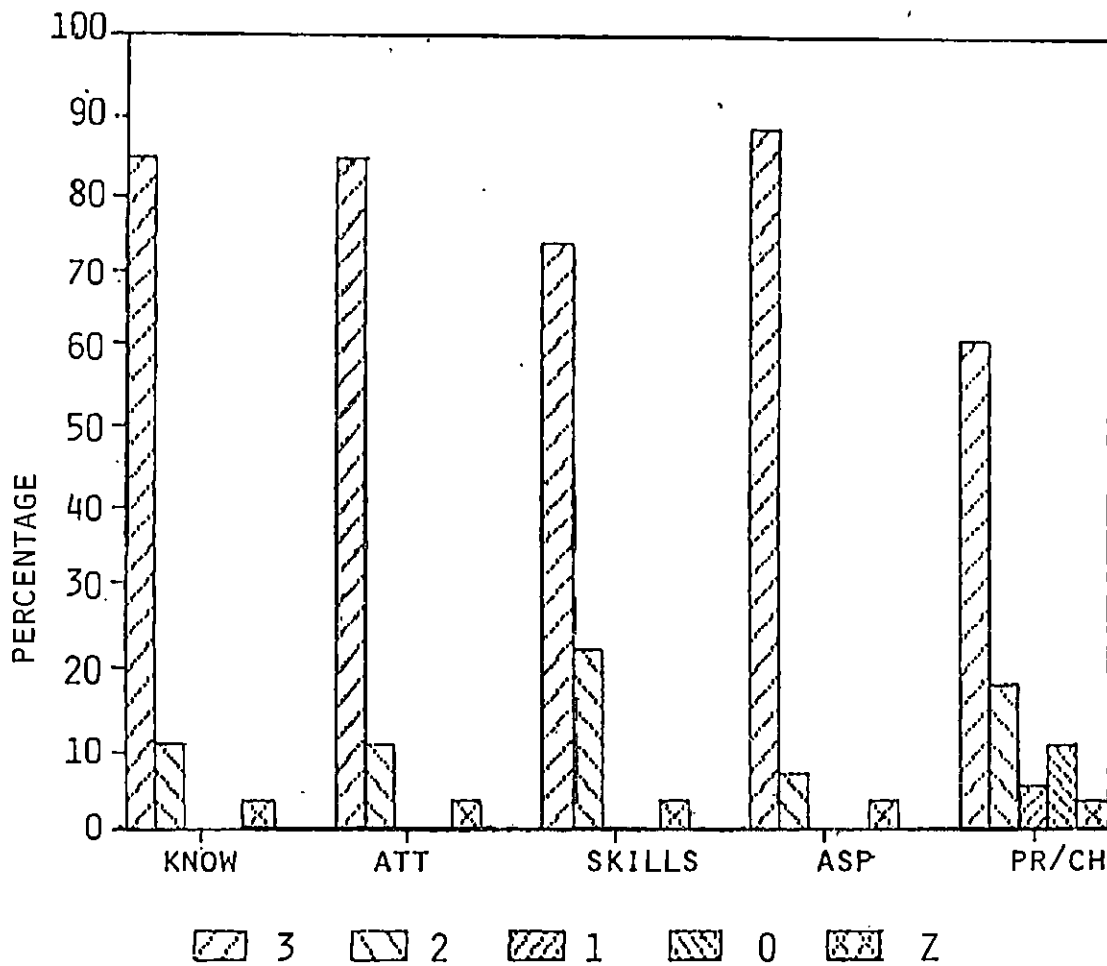
In the practice change arena, the results of the extension education programmes through farming systems research are tentatively positive and suggest having exceeded the target adoption rate of 5 percent stipulated in the Farming Systems Research project paper for the prototype areas. Since KASA change is prerequisite to practice change, it is only fair to say that it is also easier to achieve. The incentives of mono-cash.

cultivation scheme and/or coercion are the only exceptions to that statement which come to mind. It is expected that practice change will happen to a lesser degree and with greater variability than KASA change, and one can expect many constraints to practice change which are beyond the control and even the influence of the extension educator.

So too, the factors that inhibit practice change are of high variability in their relative costs and consequences. For example, it is less costly, more simple, less risky and grossly less time consuming to adopt a new Safim planter shoe than it is to dramatically cull a herd of cattle or decide to grow fodder instead of grain. It is easier to plant a new variety of wheat than it is to make a significant change in range management. In all subject matter areas there are non-adopters. This is so the world over, to far more serious degrees than reported in Lesotho.

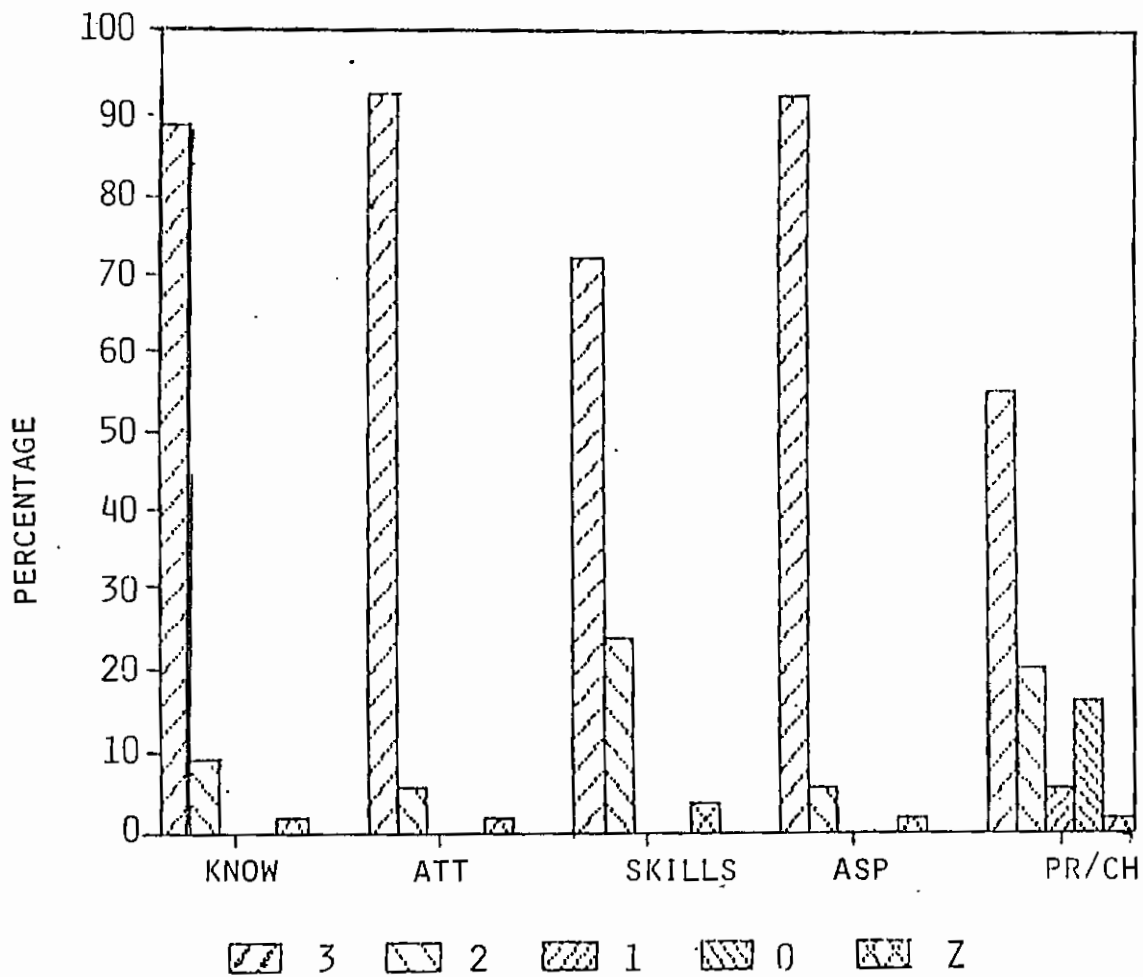
The data on practice change, given the above qualifications, are encouraging. The highest degree of suggested practice change is found in agronomy, followed by horticulture, farm machinery, plant protection, and animal range management in that order. And, that the change was related to extension education by the respondents themselves. These data may be seen graphically in Figures 5.2, 5.3, 5.4, 5.5 and 5.6.

FIGURE 5.2: KASA AND PRACTICE CHANGE IN AGRONOMY, LESOTHO, 1985



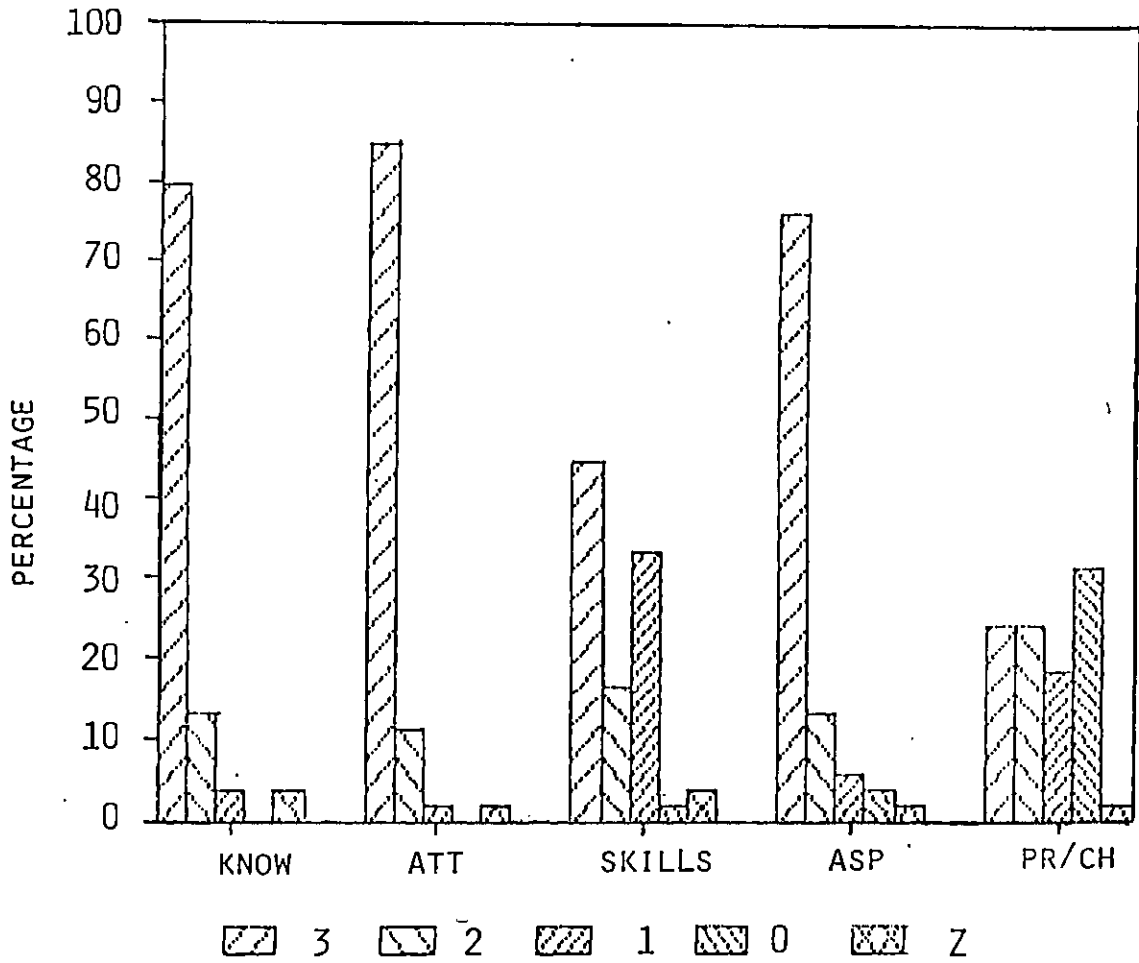
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

FIGURE 5.3: KASA AND PRACTICE CHANGE IN HORTICULTURE, LESOTHO, 1985



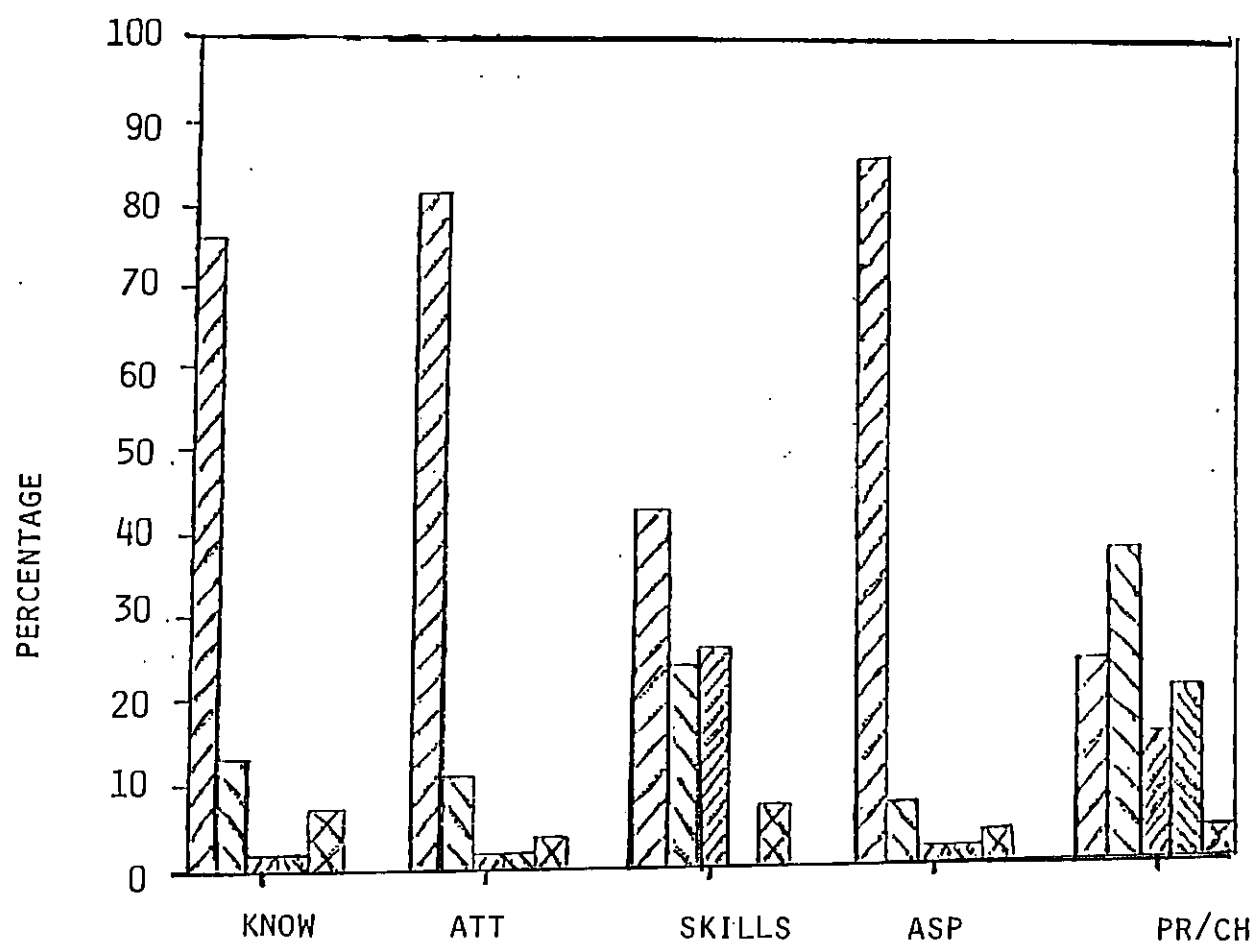
3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

FIGURE 5.4: KASA AND PRACTICE CHANGE IN PLANT PROTECTION, LESOTHO, 1985



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

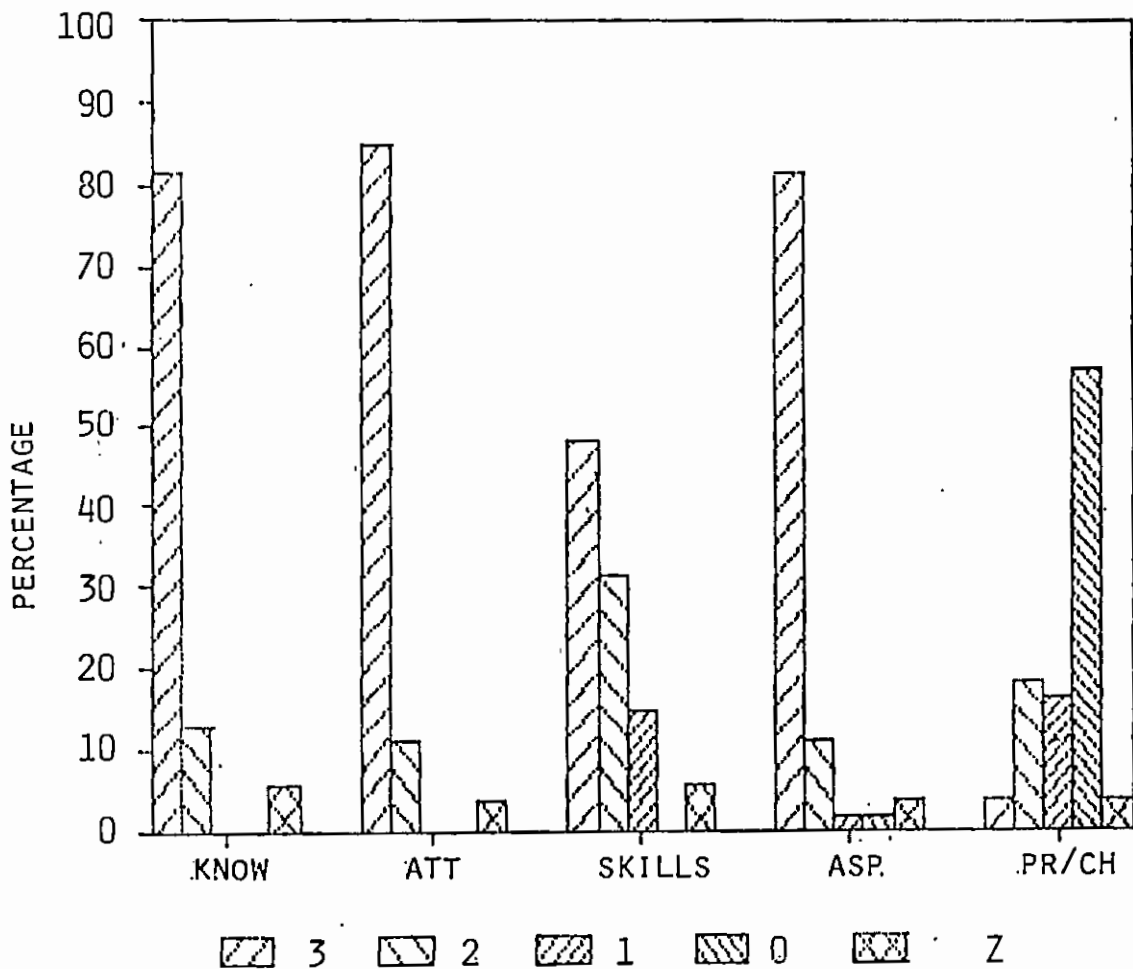
FIGURE 5.5: KASA AND PRACTICE CHANGE IN FARM MACHINERY



3 2 1 0 Z

3 = TO A GREAT EXTENT
 2 = TO A FAIR EXTENT
 1 = TO A SLIGHT EXTENT
 0 = NOT AT ALL
 Z = OTHER

FIGURE 5.6: KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT, LESOTHO, 1985



3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

1 = TO A SLIGHT EXTENT

0 = NOT AT ALL

Z = OTHER

(c) KASA change and intensity of extension education:

When KASA data is related to the number of short courses each respondent attended, a slightly different configuration emerges, which may be seen in Tables, 5.3, 5.4, 5.5 and 5.6. There were 5 respondents who had attended a single course, 17 who attended two courses, 18 who attended three courses, and 14 who had been to all four courses. The KASA scores commence high with little variability among the participants in the first courses. Responses appear to remain rather high but gain variability as people benefit from having attended two farmer education courses. KASA values for respondents attending three courses seem to gain in cumulative strength and also in variability. Respondents attending all four courses report very high KASA scores and variability decreases. That is, quality of learning seems to increase together with intensity of extension education. This trend prevails in all agricultural subject matters.

Although, as expected, cumulative practice change lags somewhat behind cumulative KASA change, the practice change results configuration with intensity of extension education appears to increase steadily. This can be seen, with minor fluctuations, in all agricultural subject matters. There is

TABLE 5.3: KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING ONE EXTENSION EDUCATION COURSE, LESOTHO, 1985

TOTAL RESPOND (5)						PERCENTAGES					
COURSE 1		Z	0	3	2	1	Z	0	3	2	1
AGR	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	3	1	0	20	0	60	20	0
	SKILL	1	0	4	0	0	20	0	80	0	0
	ASP	1	0	4	0	0	20	0	80	0	0
	PR/CH	1	1	2	1	0	20	20	40	20	0
HORT	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	4	0	0	20	0	80	0	0
	SKILL	1	0	3	1	0	20	0	60	20	0
	ASP	1	0	4	0	0	20	0	80	0	0
	PR/CH	1	2	2	0	0	20	40	40	0	0
PL/PROT	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	3	1	0	20	0	60	20	0
	SKILL	1	0	3	0	1	20	0	60	0	20
	ASP	1	0	3	0	1	20	0	60	0	20
	PR/CH	1	2	1	1	0	20	40	20	20	0
FRM/MC	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	4	0	0	20	0	80	0	0
	SKILL	1	0	3	1	0	20	0	60	20	0
	ASP	1	0	3	0	1	20	0	60	0	20
	PR/CH	1	2	1	1	0	20	40	20	20	0
ANI/MGT	KNOW	1	0	4	0	0	20	0	80	0	0
	ATT	1	0	3	1	0	20	0	60	20	0
	SKILL	1	0	4	0	0	20	0	80	0	0
	ASP	1	0	4	0	0	20	0	80	0	0
	PR/CH	1	3	0	1	0	20	60	0	20	0

Z = OTHER
 0 = NOT AT ALL
 3 = TO A GREAT EXTENT
 2 = TO A FAIR EXTENT
 1 = TO A SLIGHT EXTENT

TABLE 5.4: KASA AND PRACTICE CHANGES FOR RESPONDENTS
ATTENDING TWO EXTENSION EDUCATION COURSES,
LESOTHO, 1985

TOTAL RESPOND (17)							PERCENTAGES				
COURSE2		Z:	0	3	2	1	Z	0	3	2	1
AGR	KNOW	0	0	13	4	0	0	0	76	24	0
	ATT	0	0	13	4	0	0	0	76	24	0
	SKILL	0	0	13	4	0	0	0	76	24	0
	ASP	0	0	14	3	0	0	0	82	18	0
	PR/CH	0	4	6	5	2	0	24	35	29	12
HORT	KNOW	0	0	14	3	0	0	0	82	18	0
	ATT	0	0	14	3	0	0	0	82	18	0
	SKILL	1	0	11	5	0	6	0	65	29	0
	ASP	0	0	15	2	0	0	0	88	12	0
	PR/CH	0	4	4	8	1	0	24	24	47	6
PL/PROT	KNOW	1	0	13	3	0	6	0	76	18	0
	ATT	0	0	13	4	0	0	0	76	24	0
	SKILL	1	1	6	4	5	6	6	35	24	29
	ASP	0	0	11	6	0	0	0	65	35	0
	PR/CH	0	8	1	6	2	0	47	6	35	12
FRM/MC	KNOW	3	0	10	4	0	18	0	59	24	0
	ATT	1	0	14	2	0	6	0	82	12	0
	SKILL	3	0	4	4	6	18	0	24	24	35
	ASP	1	0	14	2	0	6	0	82	12	0
	PR/CH	1	2	2	7	5	6	12	12	41	29
ANI/MGT	KNOW	2	0	10	5	0	12	0	59	29	0
	ATT	1	0	12	4	0	6	0	71	24	0
	SKILL	2	0	4	6	5	12	0	24	35	29
	ASP	1	0	12	4	0	6	0	71	24	0
	PR/CH	1	7	0	6	3	6	41	0	35	18

Z = OTHER
 0 = NOT AT ALL
 3 = TO A GREAT EXTENT
 2 = TO A FAIR EXTENT
 1 = TO A SLIGHT EXTENT

TABLE 5.5: KASA AND PRACTICE CHANGES FOR RESPONDENTS ATTENDING THREE EXTENSION EDUCATION COURSES, LESOTHO, 1985

TOTAL RESPOND (18)						PERCENTAGE					
COURSE3		Z	0	3	2	1	Z	0	3	2	1
AGR	KNOW	1	0	15	2	0	6	0	83	11	0
	ATT	1	0	16	1	0	6	0	89	6	0
	SKILL	1	0	13	4	0	6	0	72	22	0
	ASP	1	0	16	1	0	6	0	89	6	0
	PR/CH	1	0	15	2	0	6	0	83	11	0
HORT	KNOW	0	0	16	2	0	0	0	89	11	0
	ATT	0	0	18	0	0	0	0	100	0	0
	SKILL	0	0	12	6	0	0	0	67	33	0
	ASP	0	0	17	1	0	0	0	94	6	0
	PR/CH	0	3	12	1	2	0	17	67	6	11
PL/PROT	KNOW	0	0	14	2	2	0	0	78	11	11
	ATT	0	0	16	1	1	0	0	89	6	6
	SKILL	0	0	5	3	10	0	0	28	17	56
	ASP	0	2	13	1	2	0	11	72	6	11
	PR/CH	0	6	3	3	6	0	33	17	17	33
FRM/MC	KNOW	0	1	14	2	1	0	6	78	11	6
	ATT	0	1	13	3	1	0	6	72	17	6
	SKILL	0	0	7	5	6	0	0	39	28	33
	ASP	0	1	16	1	0	0	6	89	6	0
	PR/CH	0	4	4	8	2	0	22	22	44	11
ANI/MGT	KNOW	0	0	16	2	0	0	0	89	11	0
	ATT	0	0	17	1	0	0	0	94	6	0
	SKILL	0	0	8	8	2	0	0	44	44	11
	ASP	0	1	14	2	1	0	6	78	11	6
	PR/CH	0	14	0	2	2	0	78	0	11	11

Z = OTHER
 0 = NOT AT ALL
 3 = TO A GREAT EXTENT
 2 = TO A FAIR EXTENT
 1 = TO A SLIGHT EXTENT

TABLE 5.6: KASA AND PRACTICE CHANGES FOR RESPONDENTS
ATTENDING FOUR EXTENSION EDUCATION COURSES,
LESOTHO, 1985

TOTAL RESPOND (14)						PERCENTAGES					
COURSE#		Z	0	3	2	1	Z	0	3	2	1
AGR	KNOW	0	0	14	0	0	0	0	100	0	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	10	4	0	0	0	71	29	0
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	1	10	2	1	0	7	71	14	7
HOKT	KNOW	0	0	14	0	0	0	0	100	0	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	13	1	0	0	0	93	7	0
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	0	12	2	0	0	0	86	14	0
PL/PROT	KNOW	0	0	12	2	0	0	0	86	14	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	10	2	2	0	0	71	14	14
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	1	8	3	2	0	7	57	21	14
FRM/MC	KNOW	0	0	13	1	0	0	0	93	7	0
	ATT	0	0	13	1	0	0	0	93	7	0
	SKILL	0	0	9	3	2	0	0	64	21	14
	ASP	0	0	13	1	0	0	0	93	7	0
	PR/CH	0	3	6	4	1	0	21	43	29	7
ANI/MGT	KNOW	0	0	14	0	0	0	0	100	0	0
	ATT	0	0	14	0	0	0	0	100	0	0
	SKILL	0	0	10	3	1	0	0	71	21	7
	ASP	0	0	14	0	0	0	0	100	0	0
	PR/CH	0	7	2	1	4	0	50	14	7	29

Z = OTHER
 0 = NOT AT ALL
 3 = TO A GREAT EXTENT
 2 = TO A FAIR EXTENT
 1 = TO A SLIGHT EXTENT

some reason to believe that these indicative gains in practice change are associated provisionally with parallel gains in KASA change, and that both kinds of change are potentially produced by extension education programmes of increasing intensity.

These data may be examined graphically in Appendix B, Appendices B.1, through B.5.

(d) The "z" response

Although a number of respondents made use of the "z" response, its significance in most cases was non-specific. The category was made available on the questionnaire for those persons who felt they could not respond honestly or accurately to a given question with a 3,2,1 or 0 reply. Only modest use was made of the "z" response. From the sparse information available, it appears that the few persons using "z" did so to indicate such conditions as "not applicable" "don't remember", or some other intervening or prevailing situation. The "z" response is not seen to have had a significant effect on the pattern of KASA and practice change data.

(e) Examples of practice change

No attempt was made to compile or tabulate data on the nature of the vast array of indicated practice change. It was considered sufficient to link reported practice change to the five agricultural subject matter areas. Researchers from those disciplines are invited to relate cumulative practice change to the nature of subject matter taught, to gain some insight into practice change differentiation. A subsequent analysis of end results will also bear some inference to differentiation of such change.

In the meantime, it is important to note that an "open end probe question" section constituted an important component of the interview questionnaire. Its purpose was to allow the interviewer, at her discretion, to make use of probe questions to explain, elucidate or confirm any response deemed necessary. The probe questions in practice were used to gain more information about positive responses as well as to understand negative responses. Responses to the former do render a variety of information about the nature of practice change. Although no attempt is made in this study

to quantify all this information, it is useful to examine some examples.

Farmer 3 said she was using organic manure and was getting higher yields. Farmer 9 said she now knew how to make a seedbed, she made one this year and used manure from the compost heap she also made. Farmer 9 also set aside a place for grazing milk cows. Farmer 13 said she stored enough maize to feed her family, she had never done that before but rather had to purchase maize meal in small packets from the shop. Farmer 14 reported that she used certified seed and fertilizer and carried out all the steps to have a good crop, she also learned how to make a good seedbed and compost heap and did so in her garden. Farmer 19 reported using cutworm bait and had good maize.

Farmer 21 said she was doing winter plowing and was getting better yields. Farmer 30 said she was now planting improved seeds and she used fertilizer*. Farmer 34 said she winter plowed her fields and used a planter. Farmer 43 said he used fertilizer and bought certified seed, because of this his yields increased from 5 bags to 12 bags. Farmer 47 said he bought ox-drawn equipment**. Farmer 48 said he was now planting recommended varieties of vegetables. Farmer 50

* Nyakosoba farmers purchased improved maize seed varieties PNR 473, PNR 493 and SSM 2043; Sorghum seed PNR 8311; and recommended 2-3-0 (21) fertilizer.

** Recommended Areana ox-drawn machinery is being bought by farmers.

said he was able to use Safterex and did not have problems from cutworm. Farmer 51 reported he now had an irrigation system and could produce vegetables all the year round*. Though these comments are not exhaustive, they represent a balanced description of practice changes actually made.

(f) Constraints to practice change

Information about constraints to practice change is more plentiful since it derives from two data sources. First, the very same "open-end probe question" facility which produced so many of the above comments on positive practice change also rendered a great deal of commentary about constraints. Second, the questionnaire met the constraint question squarely with its question 12 which asked the respondent if there were changes he/she really wanted to make on his/her farm but was unable to do so, to please explain why.

Commentary is abundant but variability is less pronounced. Thus, it becomes possible to quantify this data, at least in terms of cumulative responses.

The constraint to constructive change in range management and improvement was that most voiced by the persons interviewed (35 respondents). The components of the

* Vegetables were marketed commercially in Nyakosoba and Siloe.

constraint are that individual farmers are powerless to make a difference, that people don't care, that people won't cooperate in the conservation of a communal resource, and that collective range management will require vast public education.

The constraint to practice change next most frequently mentioned was the non-availability of personal finances to enable desired change. This was stated by 32 respondents. They said they required money to buy or expand into such things as feed, fruit trees, milk cows, poultry, seed, fertilizer, pigs, vegetable gardens, cattle, ox-drawn machinery and fodder. It can be seen that the need for finance embraces three activities, namely purchase of inputs, purchase of supplies, and mounting of new enterprises.

The non-availability of pesticides locally was voiced by 18 people and constituted the third most serious constraint to change as seen by respondents. Many said they know what plant diseases and insect pests they have but are not able to find the necessary pesticides.

Inadequate training is a grouped constraint to change representing the individual shortfalls of 14 persons who felt they needed more instruction in such areas as pesticide

applications, farm machinery, fruit tree cultivation poultry production, and animal management.

Pest and animal damage to growing crops was seen as a constraint to meaningful change by 13 persons. This observation involved both infestation by insects, disease, and hardy weeds as well as livestock grazing growing plants.

Lack of resources was another collective constraint to change mentioned by 13 persons who stated they wanted to do certain activities, but did not do so, for lack of such things as farm machinery, oxen, land and plastic.

Drought or non-availability of irrigation water was stated as a constraint to change by 10 respondents.

It can be clearly seen that the constraints to practice change as perceived by members of farmer contact groups lie almost totally outside the scope of farming systems research and extension education dynamics. That is to say that even though farming systems research and extension successes have been suggested thus far in this study, it will still require a comprehensive and enforceable range conservation policy nationwide if significant breakthroughs against range degradation are to be achieved. If credit is

not available to individual farmers nationwide, then investment in needed resources or new enterprises may not be widely made. If pesticides are not made available to farmers in remote areas in a timely way by the parastatal supply organization or private traders, then they will likely not be used to the desired degree to combat potential devastation by pests.

Drought is persistent in most of Africa during the current climatic cycle, and inadequacies in training expressed by a few respondents will continue to be addressed. They are few, however, compared to the promising KASA change results reported earlier.

It would appear that farming systems research extension education programmes achieved some potential successes among members of farmer contact groups in the areas of KASA and practice change during the 1979 - 1984 period. It must be remembered, however, that farming systems research and extension as a dynamic development strategy, does not operate in a vacuum.

The infrastructure conducive to agricultural development must be in place, credit must be attainable, inputs must be available, and markets must be developed and protected in order for farming systems research to have its maximum effect.

5.6.5 End results

Despite the constraints voiced above, there were indicative practice changes during 1979 - 1984 among members of farmer contact groups induced, according to their perceptions, through the extension education programmes of farming systems research. However, end results, otherwise termed real benefits to farmers, constitute the final measuring stick for determining the value of the farming systems research and extension intervention in Lesotho, and the concurrent adoption of the farming systems dynamic by the Research Division of the Ministry of Agriculture as its central operational philosophy. This study purports to elucidate those end results as the highest evidence level (Bennett 1976) in the context of change related to extension education programmes by participant farmers.

In consultation with research colleagues, several indicators

were selected as factors to be determined in the assessment of real benefits (end results) of farming systems research to members of farmer contact groups as perceived by them to be related to extension education programmes.

The indicators*are (AA) more income from farming, (BB) more trading with neighbours, (CC) acquisition of more property, (DD) acquisition of better animals, (EE) stored and/or preserved food, (FF) better meals for family, (GG) better education for children, (HH) higher crop yields, (II) better condition of animals, (JJ) able to purchase improved inputs, (KK) able to secure credit/loans, (LL) improved farm records, (MM) better markets, (NN) other, and (OO) no significant benefits. These indicators, while not exhaustive, are thought to be consistent with the stated objectives of the Farming Systems Research Project in Lesotho.

Responses from the 54 persons in the farmer contact group were entered into the computer for tabulation and analysis, and the outcomes may be seen in Table 5.7 and Figure 5.7 for the total sample. Since the (NN) other and the (OO) no significant benefits categories had a 100 percent non-response, they have been eliminated from the data.

* Indicators are generally reflective of FSR objectives.

TABLE 5.7: END RESULTS (REAL BENEFITS) TO MEMBERS OF FARMER CONTACT GROUPS OF EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985

	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	39	43	15	39	67	80	43	65	50	50	0	17	37	0	0
1	57	52	81	56	31	19	39	31	37	44	93	44	9	0	0
2	0	0	2	4	0	0	11	2	7	2	0	33	15	0	0
3	4	6	2	2	2	2	7	2	6	4	7	6	39	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

0 = YES

1 = NO

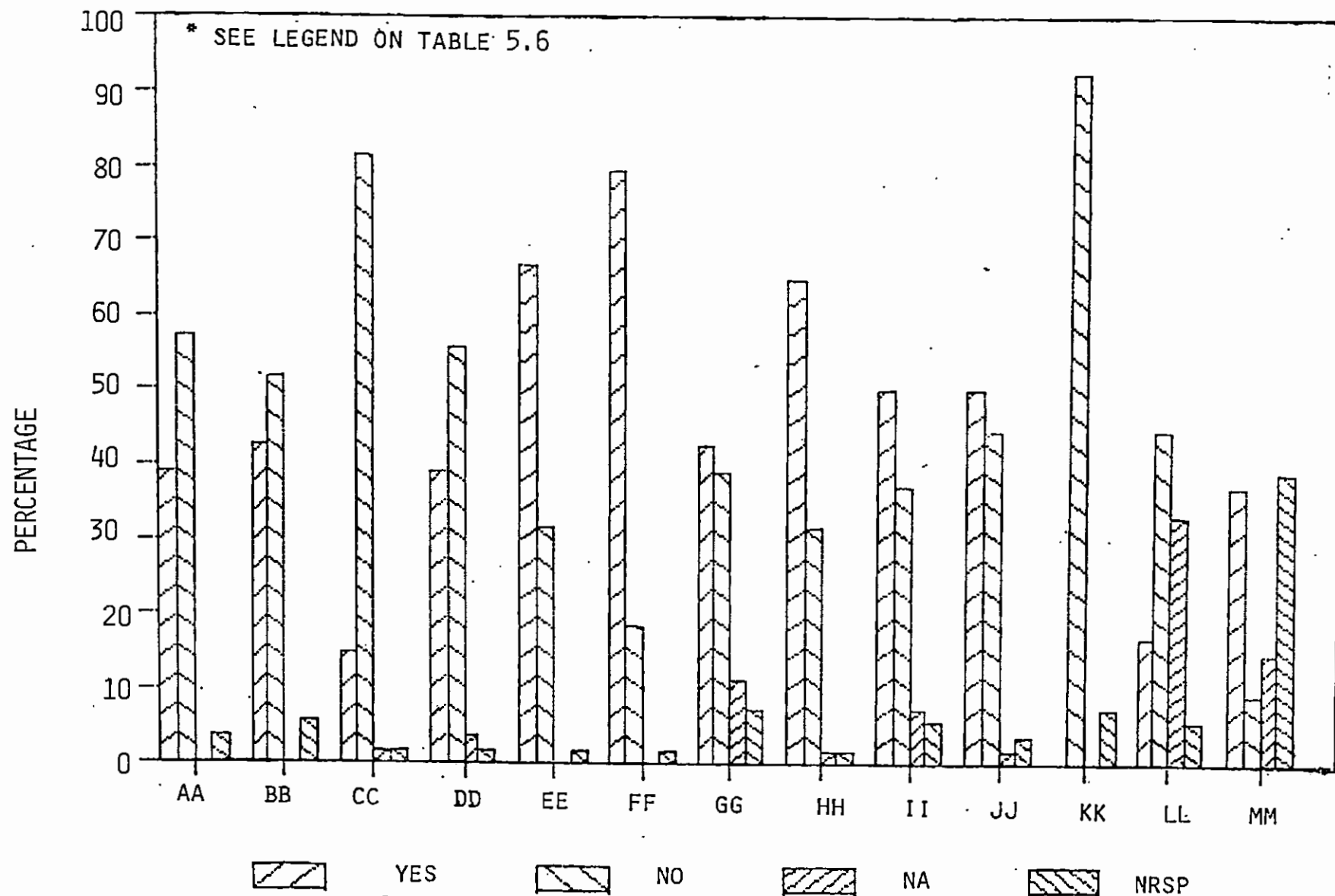
2 = NOT APPLICABLE

3 = NO RESPONSE

LEGEND TO END RESULTS
TABLE AND GRAPHS

- AA = MORE INCOME FROM FARMING
- BB = MORE TRADING WITH NEIGHBOURS
- CC = ACQUISITION OF MORE PROPERTY
- DD = ACQUISITION OF BETTER ANIMALS
- EE = STORED AND/OR PRESERVED FOOD
- FF = BETTER MEALS FOR FAMILY
- GG = BETTER EDUCATION FOR CHILDREN
- HH = HIGHER CROP YIELDS
- II = BETTER CONDITION OF ANIMALS
- JJ = ABLE TO PURCHASE IMPROVED INPUTS
- KK = ABLE TO SECURE CREDIT/LOANS
- LL = IMPROVED FARM RECORDS
- MM = BETTER MARKETS
- NN = OTHER
- OO = NO SIGNIFICANT BENEFITS

FIGURE 5.7: END RESULT (REAL BENEFIT) TO MEMBERS OF FARMER CONTACT GROUPS OF EXTENSION EDUCATION PROGRAMMES* LESOTHO, 1985



As can be seen, the most significant end result or real benefit reported by the total sample of members of farmer contact groups as perceived by them as related to farming systems research extension education programmes was (FF) better meals for family. It was reported as a benefit by 80% of the respondents and seems closely linked to the next most significant benefit (EE) stored and/or preserved food, reported by 67% of the respondents*. This finding is likely related to the nutrition and domestic management extension education programmes described in section 5.2 in this chapter. The finding is also likely related to the high incidence of KASA and practice change in horticulture shown on Table 5.3 of this chapter since stored and preserved food and subsequent dietary improvements is thought to be related to home grown vegetables. Finally, the finding is probably sex specific since the extension education programme in nutrition and home economics was given only for women, and the majority of the respondents are likewise women.

The third most significant benefit, and the first which is not sex specific or sex influenced, is (HH) higher crop yields**, a finding reported by 65% percent of the respondents. This is followed by (II) better condition of

* An important FSR objective.

** Farmers are using improved varieties of maize and sorghum seed, are cultivating pinto beans, and are applying recommended fertilizers.

animals* and (JJ) able to purchase improved inputs, benefits each according to 50% of the respondents. These three appear to be linked and are likely influenced as well by (AA) more income from farming which benefited 39% of the respondents, and (DD) acquisition of better animals accruing to 39% of the sample as well.

The 43% of the sample who reported (BB) more trading with neighbours and the 37% who benefited from (MM) better markets are responsible for two more possibly related findings in which can be detected an apparent improvement in local means of disposing of surpluses. These findings may also be related to those reported in the 5.6.2 g section of this chapter where some of these marketing dynamics and the produce involved were discussed.

Finding (GG) better education for children at best is a desirable and positive benefit. Its direct relationship to farming systems research and extension is seen as tenuous although the awareness and cumulative educational "product" among parents probably has some influence. A few respondents who reported this benefit could not relate it to the farming systems research experience.

* A "grazing land at home" association of 76 farmers in Siloe are cultivating one hectare each of fodder to include fodder sorghum, barley, oats, rye, teff and others. Residents of one Nyakosoba village are practicing rotational grazing on native pastures, and two Molumong villages are alternating fodders with range rest schemes.

Whatever impacts have derived from the farming systems research intervention in farm record keeping have not accrued significantly to members of the farmer contact groups, 17% of which reported (LL) improved farm records as benefit. It must be stated, however, that the farm records programme was conducted among a specifically identified group of clients and its outcomes are not being evaluated within the scope of this study. It must also be stated that neither farm records specifically nor farm management in general were prominent among the agricultural subject matter taught to farmers in the extension education programmes.

Also not among the significant benefits of the extension education programmes was (CC) acquisition of property reported as a positive outcome by 15% of the sample. Of course, given the value of some property such as ox-drawn equipment, tools, etc., 15% may not be as insignificant as it seems.

A resounding nonbenefit, and one reported by 93% of the sample and 7% nonrespondents, was (KK) the ability to secure credit or loans. It is obvious that the provision and sustenance of credit and loans is not among the components of farming systems research philosophy and

dynamics. It is, nonetheless, a helpful if temporary resource and mention has been made of the potential of farm credit. By the end of 1984, its procurement seems to have been beyond the capability of farmer contact group membership. This is a finding which is expected to change dramatically since farmer contact groups in Molumong and Nyakosoba were trained in cooperatives early that year; a condition which, among other things, qualified the membership for credit and loans through the Agricultural Development Bank*. But, those events are beyond the scope of this study.

Thus, it can be seen that perceived benefits have accrued to members of the farmer contact groups as a result of having participated in a variety of extension education programmes within the context of farming systems research. Provisionally, as in the case of KASA and practice change analysis, these data, analyzed on the basis of those respondents attending one, two, three and four extension courses, produce a similar pattern of indicative growth in percentage benefits with increased intensity of extension education. This "extension effect" may be seen in Table 5.8. The evidence certainly suggests that real benefits to farmers, along with associated gains in KASA and practice change can

* Nyakosoba farmer cooperative members borrowed R6 154,58 in 1986 from ADB and purchased improved maize and sorghum seed and recommended fertilizer from Coop Lesotho.

TABLE 5.8: GROWTH IN REAL BENEFITS TO FARMERS WITH INTENSITY OF EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985

PERCENTAGE RESPONSE FOR ONE COURSE															
	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	40	60	0	20	40	60	20	40	20	40	0	0	40	0	0
1	60	40	100	80	60	40	60	60	60	40	100	80	0	0	0
2	0	0	0	0	0	0	20	0	0	0	0	0	20	0	0
3	0	0	0	0	0	0	0	0	20	20	0	20	40	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
PERCENTAGE RESPONSE FOR TWO COURSES															
	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	24	29	6	53	65	82	35	53	53	35	0	18	24	0	0
1	71	65	94	41	35	18	35	47	47	65	94	59	6	0	0
2	0	0	0	6	0	0	18	0	0	0	0	24	24	0	0
3	6	6	0	0	0	0	12	0	0	0	6	0	47	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
PERCENTAGE RESPONSE FOR THREE COURSES															
	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	44	44	17	33	78	83	44	83	50	61	0	11	39	0	0
1	56	50	78	61	22	17	44	11	33	33	94	28	11	0	0
2	0	0	6	6	0	0	11	6	17	6	0	61	11	0	0
3	0	6	0	0	0	0	0	0	0	0	6	0	39	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
PERCENTAGE RESPONSE FOR FOUR COURSES															
	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO
0	50	50	29	36	64	79	57	64	57	57	0	29	50	0	0
1	43	43	64	57	29	14	29	29	21	36	86	36	14	0	0
2	0	0	0	0	0	0	0	0	7	0	0	21	7	0	0
3	7	7	7	7	7	7	14	7	14	7	14	14	29	100	100
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

- AA = MORE INCOME FROM FARMING
 BB = MORE TRADING WITH NEIGHBOURS
 CC = ACQUISITION OF MORE PROPERTY
 DD = ACQUISITION OF BETTER ANIMALS
 EE = STORED AND/OR PRESERVED FOOD
 FF = BETTER MEALS FOR FAMILY
 GG = BETTER EDUCATION FOR CHILDREN
 HH = HIGHER CROP YIELDS
 II = BETTER CONDITION OF ANIMALS
 JJ = ABLE TO PURCHASE IMPROVED INPUTS
 KK = ABLE TO SECURE CREDIT/LOANS
 LL = IMPROVED FARM RECORDS
 MM = BETTER MARKETS
 NN = OTHER
 OO = NO SIGNIFICANT BENEFITS

be achieved through concentration of effort on extension programmes.

Component data on these findings may be found in Appendix B, Appendices B6, B7, B8 and B9, and in Appendix C, Appendices C 1 and C2.

5.6.6 Farmer contact groups as an innovations diffusion network

Farmer contact groups were organized, not only as target audiences for extension education programmes, but also as components of an innovations diffusion network. It was felt that a few cooperating farmers, on whose lands on-farm research and demonstrations were to be conducted, would likely adopt recommended crops and practices generated by such joint activity. It seemed logical as well that farmer contact group members, the target of intensive extension education, would be prone to positive growth in KASA and practice change (adoption). If such desired adoption was to happen on a wider front, however, it was seen that farmer contact groups would have to perform a great deal of dissemination of information among other farmers. They would be expected to constitute, as it were, an innovations

diffusion network; and individual members would be expected to tell other farmers about new information and practices, show other farmers live examples of innovations, and actually encourage and facilitate observation by others of new or different things happening on their farms. Such activity would result in a "multiplier effect", it was intended, and the multiplier effect in turn would enhance the probability of adoption of innovations on a wider front. Thus, from the beginning, farmer contact groups were educated on their roles and responsibilities with special emphasis on dissemination and diffusion. How well this was accomplished is indicated by the following analysis.

At the time of the personal interviews with members of the sample, respondents were asked how many other farmers they had told about new agricultural information and practices, how many they had showed how to farm in better ways, and how many they thought had learned better farming methods by observing what members did on their own farms. A simple compilation of these data show the potential effectiveness of the 54 respondents, as seen on Table 5.9.

TABLE 5.9: DIFFUSION EFFECTIVENESS OF INDIVIDUAL RESPONDENTS, LESOTHO 1985

BIO. DATA										
QUEST. NO	AGE	SEX	AREA	YRS/FRM	EDUC(Std)	MIG/RSA	TOLD	SHOWED	OBSERVED	
1	42	Female	Nyakosoba	15	5	1	35	6	10	
2	48			37	2	1	16	6	4	
3	62			14	7	6	8	3	10	
4	36			6	6	0	10	5	6	
5	47			24	6	1	20	0	5	
6	42			11	5	1	30	10	3	
7	59			25	1	0	15	2	4	
8	42			1	3	3	15	2	8	
9	30			5	6	1	10	5	0	
10	71			30	1	0	30	20	5	
11	50			20	6	3	5	1	2	
12	50			20	3	1	25	15	5	
13	55			15		5	30	3	5	
14	31			5	4	1	10	4	4	
15	43			10	5	1	30	11	10	
16	50			20	5	1	35	20	15	
17	45			5	3	1	40	7	20	
18	40		13	3	1	8	3	0		
19	32	Female	Siloe	4	4	3	6	1	0	
20	27			7	7	2	2	3	1	
21	40			12	4	0	4	3	2	
22	55			3	6	2	2	3	2	
23	28			2	7	1	15	1	1	
24	48			14	3	1	10	5	8	
25	48			25	1	2	25	3	2	
26	69			4	2	0	0	0	0	
27	52			10	2	1	10	6	6	
28	39			0	4	4	0	0	0	
29	56			31	5	1	0	0	0	
30	34			6	3	8	25	0	5	
31	42			12	3	2	2	0	0	
32	30			2	7	4	30	11	11	
33	35			5	4	1	2	1	1	
34	48			5	6	4	20	6	3	
35	43			12	7	0	7	7	6	
36	21	Female	Molumong	5	7	1	20	4	5	
37	45			27	6	0	20	19	4	
38	31			3	4	1	10	4	4	
39	62			36	4	3	5	2	2	
40	24			6	6	6	15	2	0	
41	62		Nyakosoba	36	4	3	5	2	2	
42	55	Male		39	0	1	25	12	7	
43	50			25	0	1	30	20	20	
44	50			20	0	2	25	13	20	
45	51	Male		Molumong	20	2	0	10	0	5
46	59		12		1	2	50	3	5	
47	65		35		0	1	10	0	0	
48	49	Male	Siloe	14	0	0	15	8	8	
49	39			3	5	0	2	2	3	
50	64			46	5	4	4	1	1	
51	48			4	1	3	25	20	4	
52	47			12	3	0	30	25	10	
53	70			20	1	2	5	3	3	
54	58			12	5	1	4	2	1	

When respondents are grouped according to age interval and farming experience, some interesting patterns begin to emerge. For example the total sample of 54 respondents collectively told 842 persons about agricultural innovations, a multiplier* effect of 15,6 in the "told" category. Those same 54 persons showed 315 others new or different things on their farms, yielding a multiplier of 5,8. Finally, the 54 respondents estimated that 268 other farmers had observed innovations on their farms, a multiplier of roughly 5. It is evident that the largest number of respondents was in the 41 - 50 age interval yielding 39% of the total number of respondents. At the same time, they were responsible for telling 460 (55%) showing 204 (65%), and facilitating observation by 167 (62%) non-members of agricultural innovations. Yet, with 30 years cumulative farming experience (roughly 4%) they appear to have performed beyond expectation. Why this age group, despite being so numerous has so little farming experience is an interesting question not answered by this analysis. Data for other age and farming experience groups may be seen on Table 5.10.

This phenomenon can likewise not be explained by analysis of the data at hand.

* Multipliers are derived by deviding the people reached in each mode by the number of respondents.

TABLE 5.10: DIFFUSION EFFECTIVENESS OF RESPONDENTS
ACCORDING TO AGE AND FARMING EXPERIENCE,
LESOTHO, 1985

AGE INT	AGE DISTR	AGE %	TOLD TOT	SHOW TOT	OBS TOT	FRM/EXP
21-30	6	11	92	26	18	27
31-40	10	19	77	23	25	57
41-50	21	39	460	204	167	30
51-60	9	17	146	31	35	167
61-70	7	13	37	11	18	191
71)	1	2	30	20	5	30

TOLD %	SHOW %	OBS %	FRM/EXP %
11	8	7	3
9	7	9	7
55	65	62	4
17	10	13	21
4	3	7	24
4	6	2	4

The same findings may be seen graphically on Figure 5.8 and Figure 5.9. The general decline in diffusion effectiveness seemingly related inversely to farming experience may be seen in Table 5.11 and Figures 5.10 and 5.11.

TABLE 5.11: DIFFUSION EFFECTIVENESS AND FARMING
EXPERIENCE, LESOTHO, 1985.

INTERVAL	DISTRIB	%	TOLD	SHOW	OBS	TOLD %	SHOW %	OBS %
FRM EXP	FRM EXP	FRM EXP						
0-7	20	37	259	81	78	31	26	29
8-15	15	28	273	95	84	32	30	31
16-23	6	11	105	52	50	12	17	19
24-31	7	13	140	64	40	17	20	15
32-39	5	9	61	22	15	7	7	6
40-47	2	4	4	1	1	0	0	0

FIGURE 5.8: DIFFUSION EFFECTIVENESS ACCORDING TO AGE AND FARMING EXPERIENCE, LESOTHO, 1985

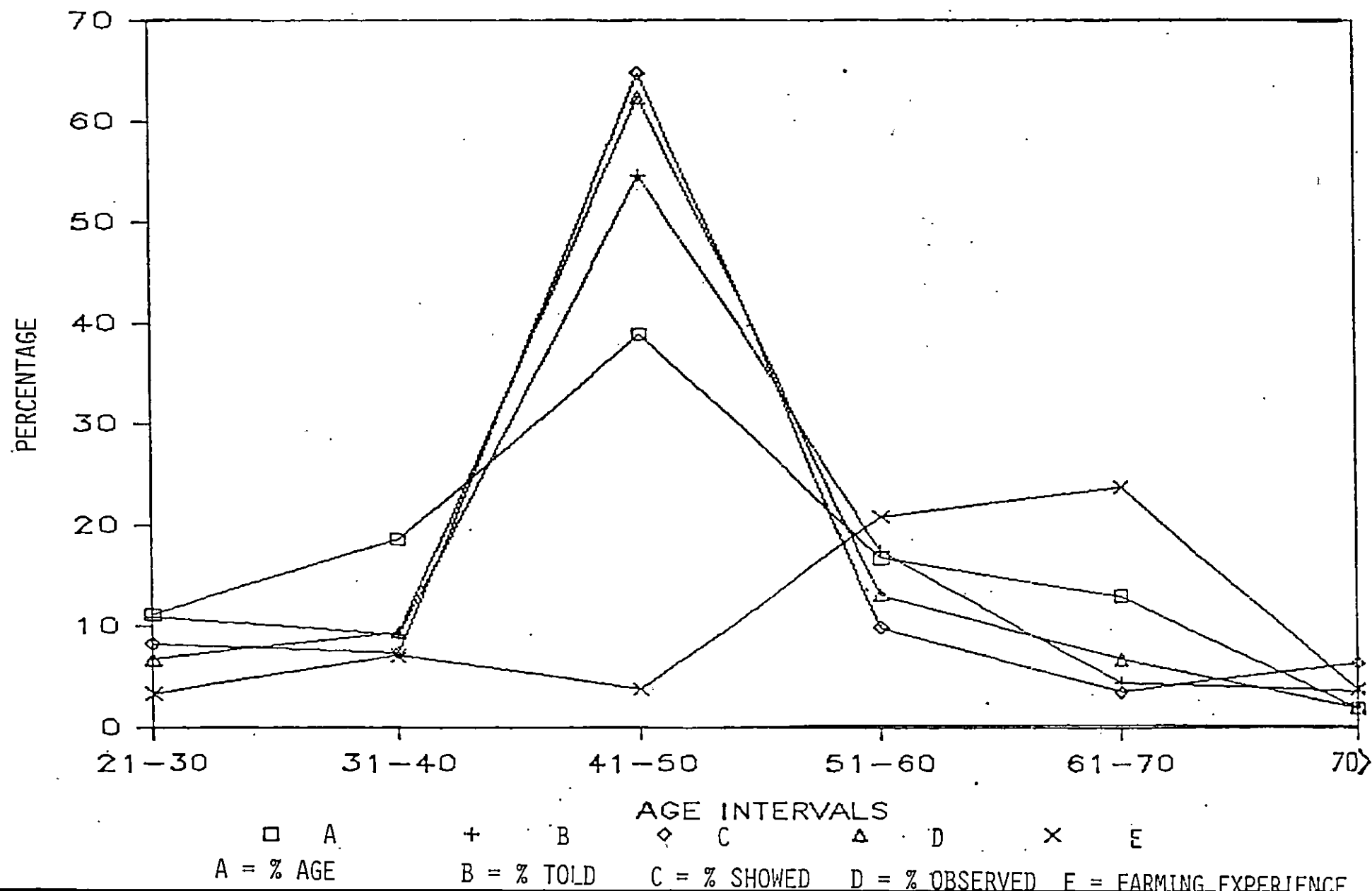


FIGURE 5.9: DIFFUSION EFFECTIVENESS ACCORDING TO AGE AND FARMING EXPERIENCE, LESOTHO, 1985

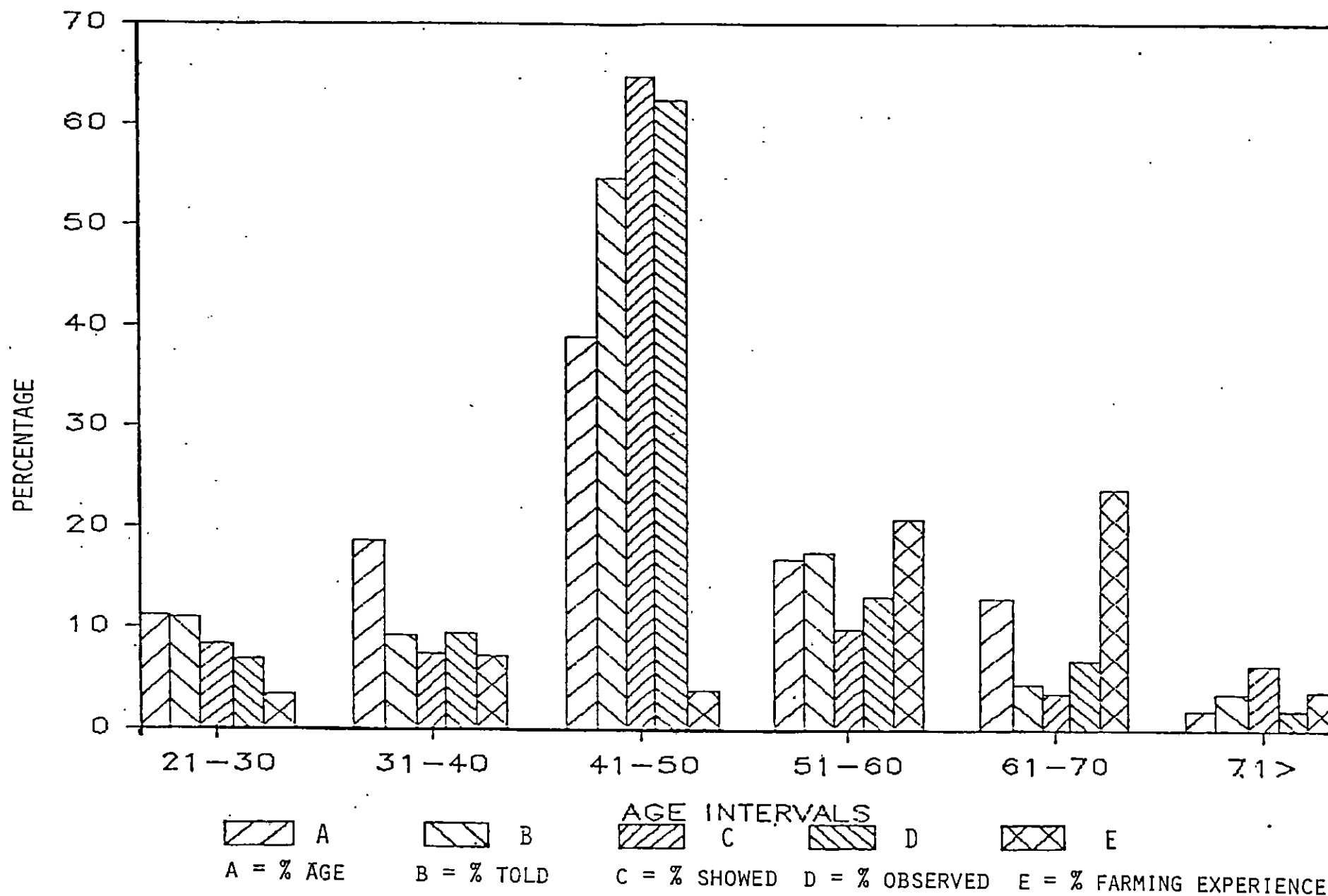


FIGURE: 5.10: DIFFUSION EFFECTIVENESS AND FARMING EXPERIENCE, LESOTHO, 1985

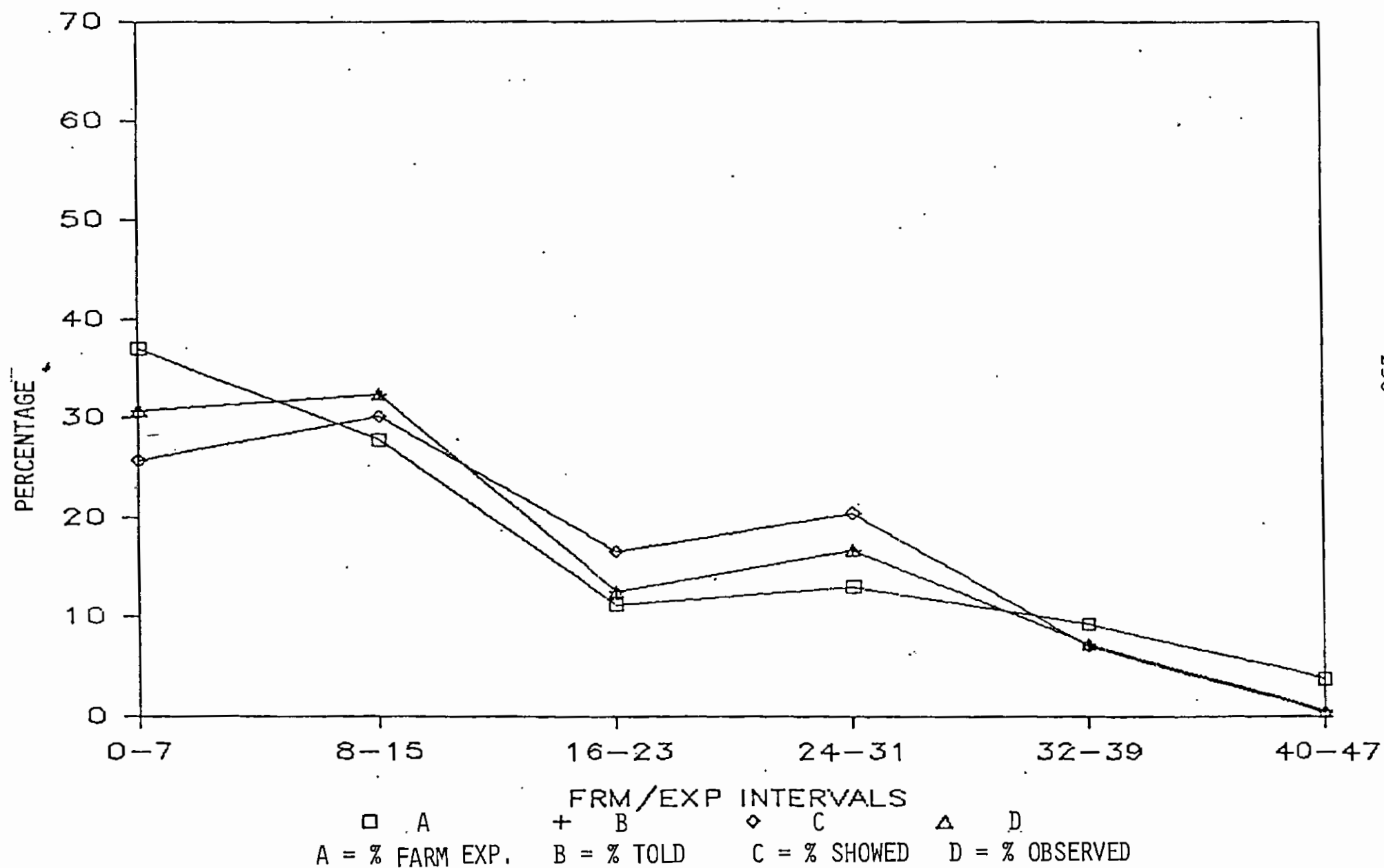
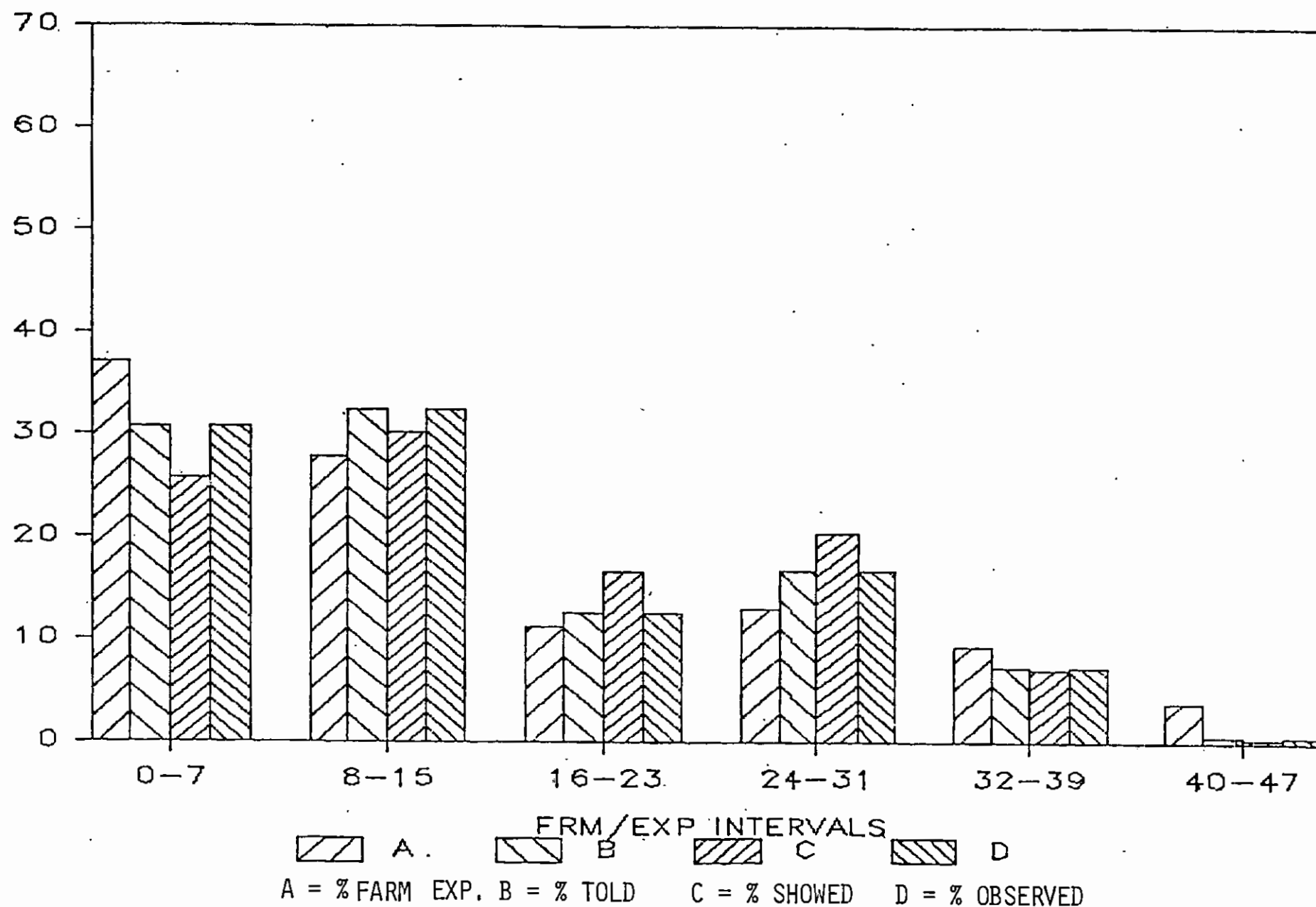


FIGURE 5.11: DIFFUSION EFFECTIVENESS AND FARMING EXPERIENCE, LESOTHO, 1985



The suggestion is that farmer contact groups appear to have been effective disseminators of agricultural information and diffusors of innovations. The 54 persons in the sample told 842 persons, showed 315 persons, and facilitated the observation by 268 persons of agricultural innovations. If that yields a mean multiplier effect of 8.8 for all diffusion forms analyzed, and if that mean multiplier factor is extended to all 224 farmers holding contact group membership, it is possible that farmer contact group members have diffused innovation deriving from farming systems research to nearly 2000 persons during the period under study. Actual adoption rates among that population cannot be determined from the current data.

5.7 SUMMARY

From the foregoing analysis, it is felt that changes in knowledge, attitudes, skills and aspirations have been achieved among members of farmer contact groups through farming systems research extension education programmes and that such changes are meaningful.

It is also suggested that promising practice change has been achieved among the same membership.

It is proposed that the above KASA and practice change has led to provisional but indicative benefits (end results) among the membership of the farmer contact group.

It is probable that the incidence of the above forms of change bear a positive and increasing relationship to intensity of extension education programmes, an "extension effect".

Members of farmer contact groups appear to be effective disseminators of information and diffusors of innovations, indicating an 8.8 mean multiplier effect for three forms of diffusion over five years.

The analysis performed in this chapter has tentatively satisfied the fourth and fifth components of the purpose of this study.

The impacts of farming systems research extension education programmes among chiefs, headmen and headwomen are examined next.

CHAPTER 6: THE EFFECTS OF FSR EXTENSION EDUCATION PROGRAMMES AMONG CHIEFS, HEADMEN AND HEADWOMEN IN THREE LESOTHO PROTOTYPE AREAS

6.1 CHIEFS, HEADMEN AND HEADWOMEN

There are few places in Africa where traditional or tribal power structures don't still continue to exert an important influence on development decisions. In Lesotho, where nearly all nationals are members of the Basotho nation, the system of village, area and principal chiefs is very much alive and dynamic. In fact, at the local and district levels, traditional chiefs wield enormous power, and the district coordinators who are appointed by the Prime Minister to deal with matters of concern to central government must at once come to terms with the various chiefs in their respective districts. This is a familiar task, however, since many of the district coordinators are chiefs in their own right and they report to the highest persons in government who are frequently chiefs themselves.

In Lesotho chiefs are hereditary in that they are of royal blood, the descendents of King Moshoeshoe or other historical African tribal dynasties. In some cases, headmen were appointed by early royalty and although they were not of the royal line, their positions became hereditary as

well. Women appear as both chiefs and headwomen in Lesotho. A woman becomes a chief if her husband dies and she has no son or if her eldest son is too young. In the former case, she serves till she dies at which time the next younger brother of the deceased male chief inherits the title which passes to his eldest son and so on. In the latter case, a female chief may abdicate in favour of her eldest son who comes of age. Headwomen appear on the scene in the same fashion and their succession is determined as in the case of the hereditary chiefs.

Traditionally, chiefs are local leaders.* They hold power to convene public assemblies, grant grazing access to the public domain, hear complaints, and resolve conflicts. They also control the movement and guarantee the safe passage of outsiders within their jurisdictions. As a natural extension of that tradition, well informed and supportive chiefs can become most important facilitators of desired change (Youmans, 1985, pp. 4 - 5).

6.2 EXTENSION EDUCATION PROGRAMMES

In view of the above, expatriate Washington State University FSR advisors and national colleagues of the agricultural Research Division realized the importance of local chiefs in

* With jurisdiction over day to day affairs of citizens.

advancing the farming systems research and extension processes. In recognition of the critical and traditional role of such persons, research and extension personnel presented extension courses for the chiefs and headmen/headwomen in the three agroclimatic research prototype areas.

On February 21 - 25, 1983 (Sefeane, 1983) and February 13 - 17, 1984 (Youmans, 1985), extension short courses were held for village chiefs, headmen and headwomen at the Matela Farmers' Training Centre. Attendance was 36 and 31 respectively. In major efforts to assist chiefs to become change agents in the farming systems research thrust, a considerable array of topics formed the curriculae. Leadership styles and communication skills were taught, and the role of farmer contact groups was explained. The intervention of chiefs themselves as promoters of small agricultural groups and of needed change was explored. Government regulations and policies on agricultural research, basic grains, new crops, grazing control, livestock importation, erosion control, and afforestation were discussed by authorized experts. The advantages to be gained through proper stocking rates and rotational grazing were pointed out. Finally, a clear explanation of farming systems research and a description of the role of chiefs in

agricultural development were emphasized. In making chiefs partners in the FSR process, a potential constraint was reduced and a major resource was gained.

6.3 THE RESEARCH PROBLEM

As in the case of farmer contact groups, the research problem became one of determining the potential effects of extension education programmes among these chiefs, headmen and headwomen. It is important to know whether FSR extension has produced perceived changes in the members of this clientele in such important areas as knowledge, attitudes, skills, aspirations, practice change, and end results. Only in that way can programmes be assessed, modified and improved.

6.4 METHODOLOGY

The reflective appraisal of programmes (RAP) methodology, an approach to the study of clientele-perceived results of extension programmes (Bennett, 1983) was again selected as central to this research problem. In that way, the reflective perceptions of the chiefs, headmen and headwomen about the outcomes of the FSR extension education programmes could be ascertained.

The methodology would require responses with respect to KASA (knowledge, attitudes, skills and aspirations) changes, practice change in the manner of conducting chiefs' affairs, and end results. This information would be collected by means of an interview/questionnaire process with the entire population of programme participants, and the data would be analyzed in a subsequent section of this chapter using analytical methods most appropriate to the data.

As has been mentioned before, the RAP methodology is a reflective evidence system of determining perceived results of extension programmes. It does this by using in participant interviews a series of standardized but modifiable questions to gain as much subjective data as possible which can then be appropriately analyzed and presented (Bennett, 1976, pp. 11 - 20).

6.5 DATA COLLECTION

Consistent with the RAP methodology described above, a questionnaire was constructed to be used concurrently with a face to face interview in order to collect from the chiefs, headmen and headwomen their reflective perceptions of FSR extension education programmes at the KASA, practice change, and end results levels. Brief attention was given to the first four evidence levels of inputs, activities, people involvement and reaction since it was felt that those outcomes were generally known and had been adequately reported elsewhere (Sefeane 1983 and Youmans 1985).

Thus, the questionnaire first presented a brief description of the FSR extension education programmes for the participants in question, giving dates, venues and content of the two extension short courses. This description and content was immediately validated with the participants in a second question which verified attendance and recollection of course content. Confirmation of the reactions evidence level was ascertained through a third question. Following was a series of standardized but modifiable questions designed to determine client perceived change due to programmes at the important evidence levels of KASA, practice change and end results. Open end probe questions

ensued at the interviewer's discretion designed to verify, challenge or otherwise clarify simple perceptive responses. The data so gathered are subjective in nature. Finally brief bio-data and recommendations were gathered to lend other dimensions to the study.

The same colleague active in former interviews was selected to assist in the development and administration of the questionnaire. She was asked to translate the questionnaire to Sesotho assisted by professional colleagues and to then compare meanings to the English original. She was by this time thoroughly familiar with the RAP methodology and interview procedures. Again, she was instructed to make a maximum of three attempts to interview personally in Sesotho each programme participant since the exercise was to be a population survey. Responses were to be recorded by the interviewer herself on individual questionnaires in Sesotho, later to be transferred in English to fresh instruments for the benefit of the principal researcher. The research assistant had been involved in the extension education programme events and had personally worked with all chiefs, headmen and headwomen in the programmes. She enjoyed their support and respect. She was asked to consider her first few interviews as field tests and tentative until she could ascertain that questions were clear and responses accurate. No problems were experienced in that regard.

The data collection instrument was administered in the form of the described questionnaire and concurrent personal interviews by the research assistant among a target of 36 chiefs, headmen and headwomen in late 1984 and early 1985. Up to three attempts were made to reach each participant. A total of 20 completed questionnaires were returned to the principal researcher for subsequent presentation and analysis. This represented a 55,6% response.

6.6 PRESENTATION AND ANALYSIS OF DATA

Computer assisted compilation, tabulation, and analysis was systematically executed on 20 completed questionnaires. This represents a 20/36 or a 55,6% response from chiefs, headmen and headwomen.

6.6.1 Biographical data

Three biographical characteristics were considered as relevant for this sample, namely age interval, sex and time as chief, headman, or headwoman.

a. Age interval

Age interval data indicated there were 2 persons in the age 21 - 30 interval, 1 representative in the 31 - 40 age group, 3 respondents in the 41 - 50 age interval, 8 persons in the age 51 - 60 group, 1 in the 61 - 70 group, and 2 in the 81 - 90 age interval. There is considerable age variability in the sample, with a range of 28 years of age. Clearly though, the highest frequency (40%) of these village officials were in the 51 - 60 year age interval.

b. Sex

Of the 20 respondents in the sample, 11 (55%) were male and 9 (45%) were female. It is reasonable to assume that these data extend to rural Lesotho in general. Thus, in the case of chiefs and headpersons as with members of farmer contact groups, women play a major role in Lesotho agriculture and rural development in general.

c. Time as chief or headperson

Of the sample, 10 respondents had served as chief, headman or headwoman between 1 - 10 years, 6 had served from 11 - 20

years, 1 person figured in the 21 - 30 year service interval, 2 had served 31 - 40 years, and 1 respondent had served 51 - 60 years. The range of service was 3 - 60 years. However the greatest frequency (50%) had served ten years or less.

6.6.2 People involvement and validation of course content

Attendance at two of two short courses conducted for this clientele was reported by 14 respondents (70%), while 6 (30%) reported attending one of the two short courses.

Fully 100% (20 persons) reported that the description of the content of the short courses as it appeared on the interview questionnaire was accurate so far as they knew.

6.6.3 Reactions

When asked to respond to what extent the course(s) met the respondents' expectations at the time, again all 20 respondents indicated that it (they) had done so to a great extent. These, along with the comments earlier stated, serve to establish highly positive feelings on extension education programmes for chiefs and headpersons at the first

four evidence levels of inputs, activities, people involvement, and reactions. Investigation into KASA, practice change and end results will show whether or not those levels are sustained.

6.6.4 KASA and practice change

Respondents were asked standardized but modified questions about knowledge, attitudes, skills and aspirations which were acquired, developed or enhanced as a result of their participation in the short course(s) held for their benefit. They were also asked about the levels of subsequent practice change directly associated with the learning attained in KASA. The response scale was again number coded to facilitate tabulation, as follows:

- to a great extent (3)
- to a fair extent (2)
- to a slight extent (1)
- not at all (0)
- don't know/don't recall (X)
- other (Z)

Scores were then compiled and analyzed, and important

findings follow. Since the topic "stocking rates" was repeated on the questionnaire, topic number 8 is eliminated from the data in favour of topic number 13. Likewise, there were no "Z" (other) responses appearing in the data.

a. Extension education programmes

There were nineteen original topics taught to chiefs and headpersons in the short course(s). These are numbered 1 to 19 in the data, minus topic 8 as explained above. These topics constitute the content axis of the data tables and their interpretive legend is as follows:

Topic number:

1. Leadership styles and communications
2. Role of chiefs in agricultural development
3. Role of farmer contact groups
4. Role of chiefs as facilitators of groups
5. Chiefs' attitudes toward agriculture
6. Farming systems research concept
7. Agronomy research in grain and crops
9. Chieftainship Act of 1968
10. Grazing control regulations

11. Rotational grazing
12. Range research in prototype areas
13. Stocking rates
14. Livestock policy and production
15. Importation of livestock
16. The abattoir
17. Animal science in the prototype areas
18. Anti-erosion works regulations
19. Forestry/woodlot policies.

Table 6.1 shows the responses of the 20 persons in the sample to the questions on these topics, and Table 6.2 presents the same data in response percentages.

b. KASA findings

As is clearly seen, the 20 respondents reported high incidences of perceived changes in knowledge, attitudes, skills and aspirations in topics numbered 1 through 10, and 17 through 18. Likewise, number scores of "3" (to a great extent) tended to dominate the frequency distribution. Although topic number 11 shows more variability, favourable KASA scores tend to obtain. Thus, it may be said that chiefs and headmen/headwomen experienced significant learning through FSR extension education programmes about their various roles in the village setting related to agricultural development. They also came to understand the

TABLE 6.1: RESPONSES OF CHIEFS AND HEADMEN/WOMEN TO QUESTIONS ON PERCEIVED KASA AND PRACTICE CHANGE RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985 (RAW SCORES)

TOPIC ** KNOWLEDGE						ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	15	2	1	2	0	17	1	0	2	0	13	4	1	2	0	15	3	0	2	0	3	10	3	2	2
2	18	1	0	1	0	17	2	0	1	0	13	5	1	1	0	16	3	0	1	0	5	7	6	1	1
3	14	3	1	2	0	15	3	0	2	0	8	8	1	3	0	14	4	0	2	0	3	9	4	2	2
4	12	5	0	3	0	12	5	0	3	0	10	6	0	3	1	9	7	0	3	1	3	9	2	3	3
5	16	2	0	2	0	18	0	0	2	0	15	2	1	2	0	17	1	0	2	0	10	6	2	2	0
6	8	6	2	3	1	12	3	2	3	0	5	7	3	4	1	9	5	1	4	1	4	8	2	5	1
7	6	3	4	7	0	9	2	2	7	0	4	2	6	8	0	9	3	1	7	0	2	5	3	8	2
9	18	0	0	2	0	17	1	0	2	0	12	3	2	3	0	16	2	0	2	0	11	4	1	4	0
10	18	2	0	0	0	18	2	0	0	0	13	5	2	0	0	17	2	1	0	0	5	3	4	0	8
11	12	3	1	3	1	13	1	2	3	1	9	4	3	3	1	11	2	3	3	1	2	2	4	3	9
12	2	5	1	11	1	4	3	1	11	1	1	4	3	11	1	7	1	0	11	1	0	1	2	13	4
13	5	3	1	11	0	7	2	0	11	0	4	3	0	10	3	8	1	1	10	0	3	1	2	8	6
14	6	0	1	13	0	6	0	0	14	0	4	2	0	14	0	5	1	0	14	0	2	3	1	14	0
15	6	0	0	14	0	6	0	0	14	0	4	1	0	15	0	3	3	0	14	0	3	2	1	14	0
16	0	3	0	17	0	0	3	0	17	0	0	3	0	17	0	0	3	0	17	0	0	1	0	15	4
17	10	3	1	6	0	12	1	1	6	0	6	4	4	6	0	11	2	1	6	0	8	3	2	6	1
18	14	4	0	2	0	13	3	0	4	0	11	5	2	0	2	16	2	0	2	0	9	4	2	2	3
19	8	4	1	6	1	11	2	0	6	1	5	5	3	6	1	11	2	0	6	1	2	3	4	6	5

* FARMING SYSTEMS RESEARCH

** TOPIC NUMBER SUBJECT EQUIVALENTS ON PAGES 273 AND 274

TABLE 6.2: RESPONSES OF CHIEFS AND HEADMEN/WOMEN TO QUESTIONS ON PERCEIVED KASA AND PRACTICE CHANGE RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985 (PERCENTAGES)

TOPIC**		KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER		3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1		75	10	5	10	0	85	5	0	10	0	65	20	5	10	0	75	15	0	10	0	15	50	15	10	10
2		90	5	0	5	0	85	10	0	5	0	65	25	5	5	0	80	15	0	5	0	25	35	30	5	5
3		70	15	5	10	0	75	15	0	10	0	40	40	5	15	0	70	20	0	10	0	15	45	20	10	10
4		60	25	0	15	0	60	25	0	15	0	50	30	0	15	5	45	35	0	15	5	15	45	10	15	15
5		80	10	0	10	0	90	0	0	10	0	75	10	5	10	0	85	5	0	10	0	50	30	10	10	0
6		40	30	10	15	5	60	15	10	15	0	25	35	15	20	5	45	25	5	20	5	20	40	10	25	5
7		30	15	20	35	0	45	10	10	35	0	20	10	30	40	0	45	15	5	35	0	10	25	15	40	10
9		90	0	0	10	0	85	5	0	10	0	60	15	10	15	0	80	10	0	10	0	55	20	5	20	0
10		90	10	0	0	0	90	10	0	0	0	65	25	10	0	0	85	10	5	0	0	25	15	20	0	40
11		60	15	5	15	5	65	5	10	15	5	45	20	15	15	5	55	10	15	15	5	10	10	20	15	45
12		10	25	5	55	5	20	15	5	55	5	5	20	15	55	5	35	5	0	55	5	0	5	10	65	20
13		25	15	5	55	0	35	10	0	55	0	20	15	0	50	15	40	5	5	50	0	15	5	10	40	30
14		30	0	5	65	0	30	0	0	70	0	20	10	0	70	0	25	5	0	70	0	10	15	5	70	0
15		30	0	0	70	0	30	0	0	70	0	20	5	0	75	0	15	15	0	70	0	15	10	5	70	0
16		0	15	0	85	0	0	15	0	85	0	0	15	0	85	0	0	15	0	85	0	0	5	0	75	20
17		50	15	5	30	0	60	5	5	30	0	30	20	20	30	0	55	10	5	30	0	40	15	10	30	5
18		70	20	0	10	0	65	15	0	20	0	55	25	10	0	10	80	10	0	10	0	45	20	10	10	15
19		40	20	5	30	5	55	10	0	30	5	25	25	15	30	5	55	10	0	30	5	10	15	20	30	25

* FARMING SYSTEMS RESEARCH

** TOPIC NUMBER SUBJECT EQUIVALENTS ON PAGES 273 AND 274

farming systems research concept and FSR field activities in agronomy, rotational grazing, and animal science, with variability of KASA changes increasing considerably in the latter to include some responses demonstrating less than adequate learning. The respondents likewise reported high levels of perceived KASA change in anti-erosion works regulations, forestry/woodlot policies, grazing control regulations and the Chieftainship Act of 1968.

In marked contrast to the above, the data show a rather dramatic incidence of inadequate KASA change and non-recall on topics 12 through 16. These topics about which comparatively little change was achieved and a great deal of non-recall experienced, were range research in the prototype areas, stocking rates, livestock production and policy, importation of livestock, and the abattoir.

c. Practice change

Practice change data tend to show a similar configuration to KASA change data. Albeit with considerably more variability and non-adoption at the practice change level of evidence, the majority of the response scores and percentages are not surprising.

What is potentially disturbing here is that much of the low incidence of practice change (non-adoption) in the realm of topics 12 through 16 seems to be directly related to inadequate learning and low recall about those topics. The topics again are range research in the prototype areas, stocking rates, livestock production and policy, importation of livestock, and the abattoir.

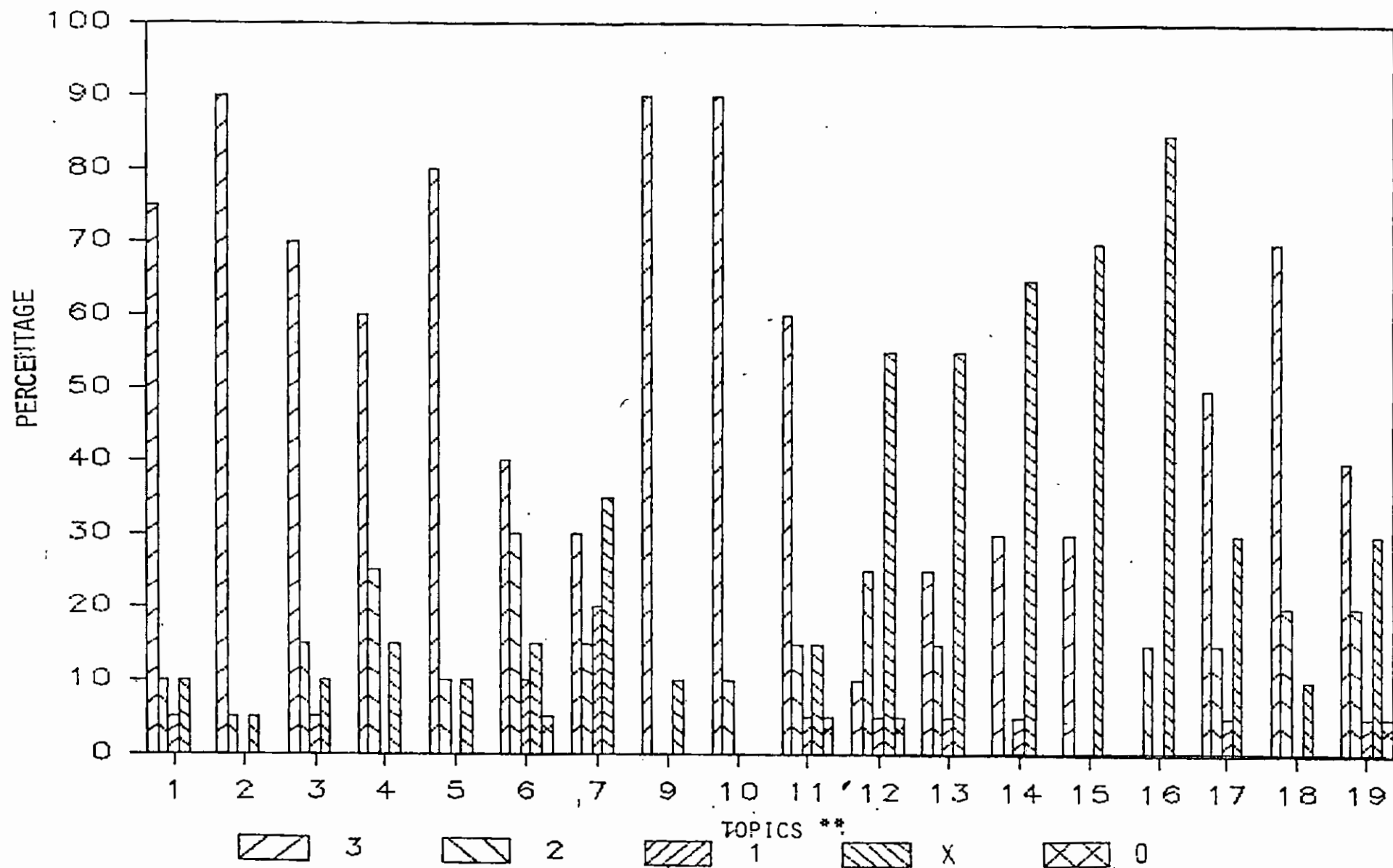
Since these topics account for 27,8% of the extension education programmes among chiefs, headmen and headwomen; the causes behind this shortfall must be subsequently investigated. The response and percentage data just examined may be seen graphically in Figures 6.1 through 6.5.

d. Examples of practice change

Apart from the rather positive but unspecified rate of practice change reported in the data, a number of respondents described examples of practice change which are helpful to this study.

Respondent 6 said he learned more about motivation skills

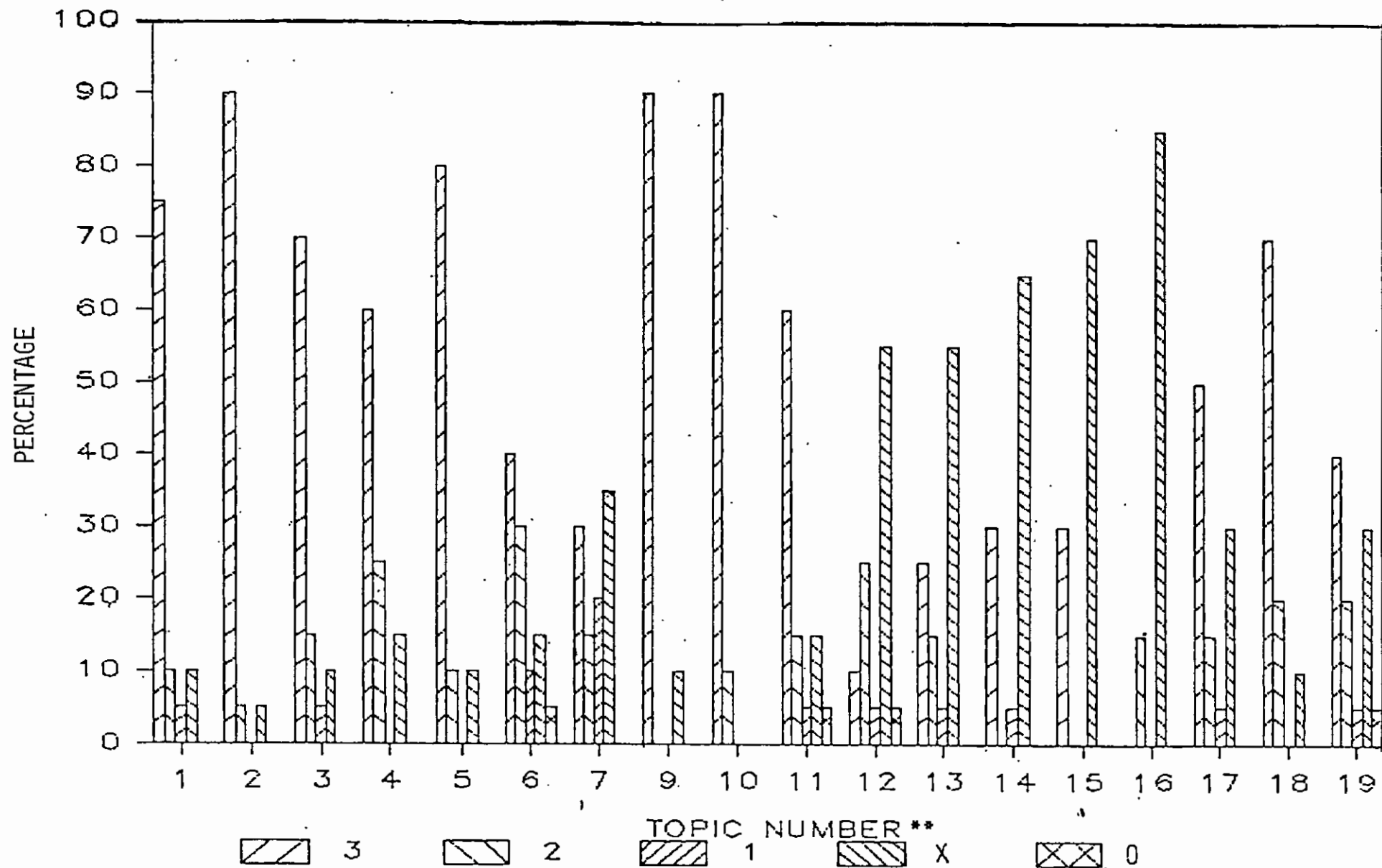
FIGURE 6.1: KNOWLEDGE CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPICS RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** SUBJECT EQUIVALENTS OF TOPICS NUMBERS 1 - 19 ON PAGES 273 AND 274

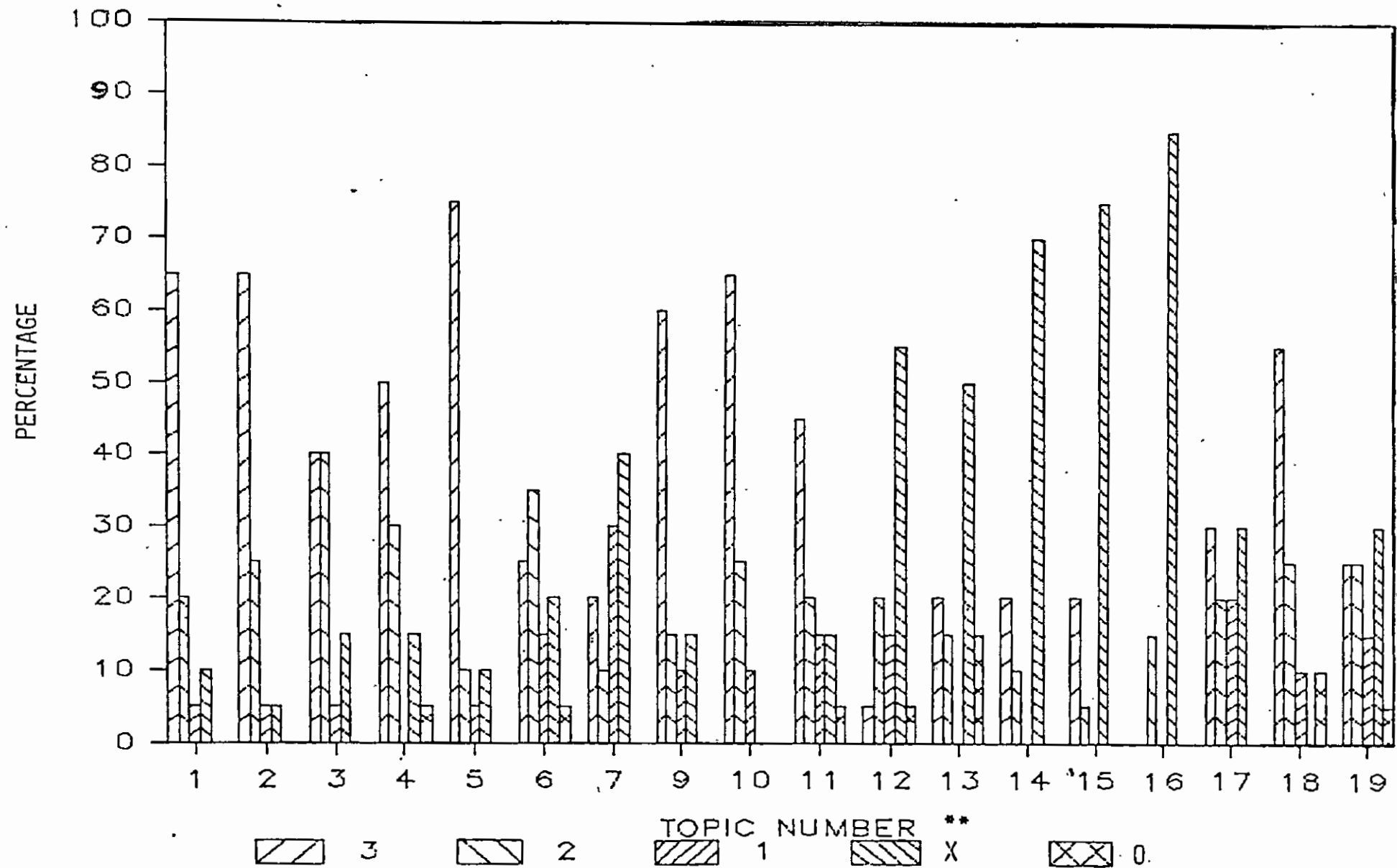
FIGURE 6.2: ATTITUDE CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPIC RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** TOPIC NUMBER SUBJECT EQUIVALENTS ON PAGES 273 AND 274

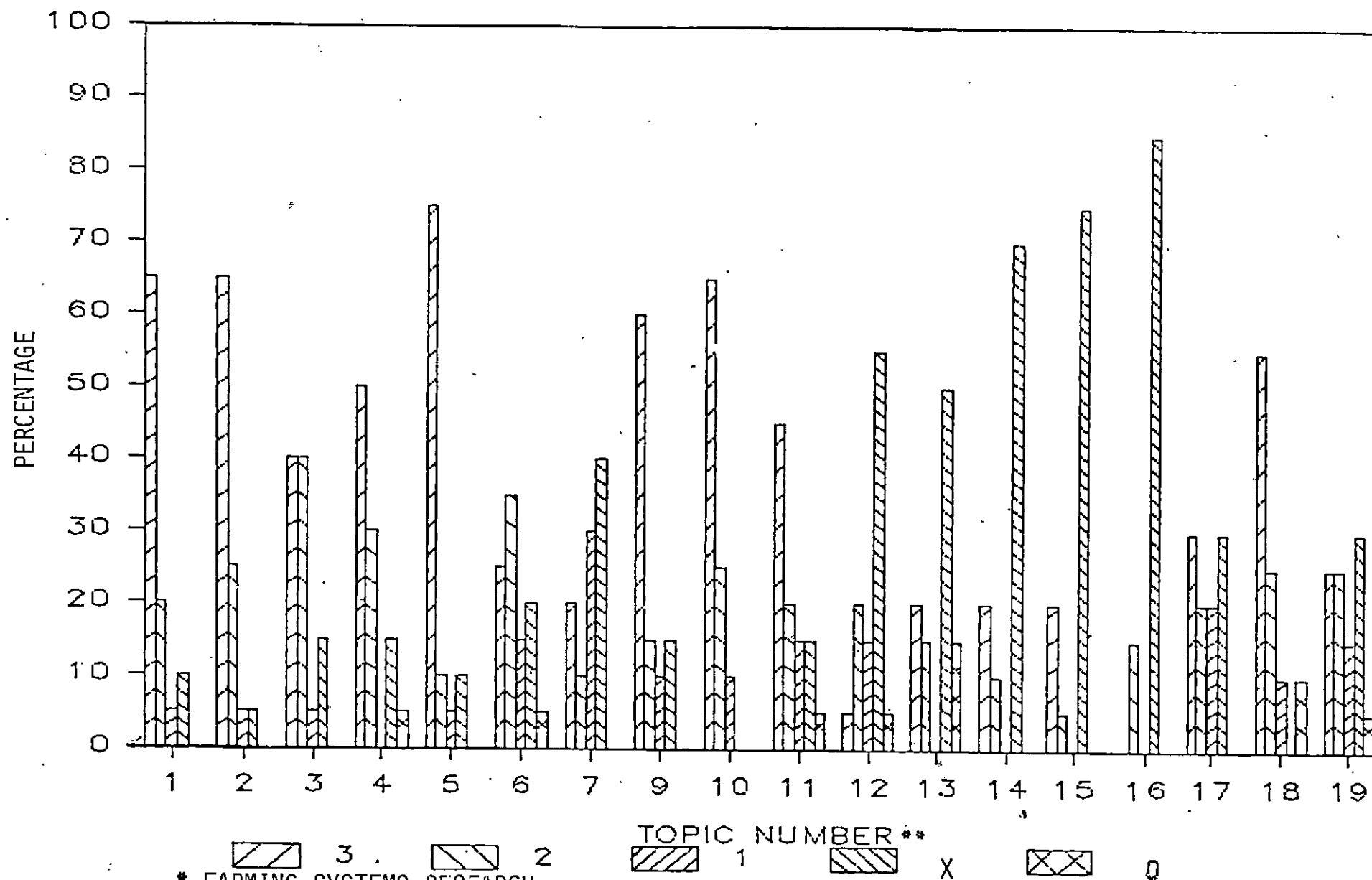
FIGURE 6.3: SKILLS CHANGES IN CHIEFS AND HEADMEN/WOMEN IN TOPICS RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** SUBJECT EQUIVALENTS OF TOPIC NUMBER ON PAGES 273 AND 274

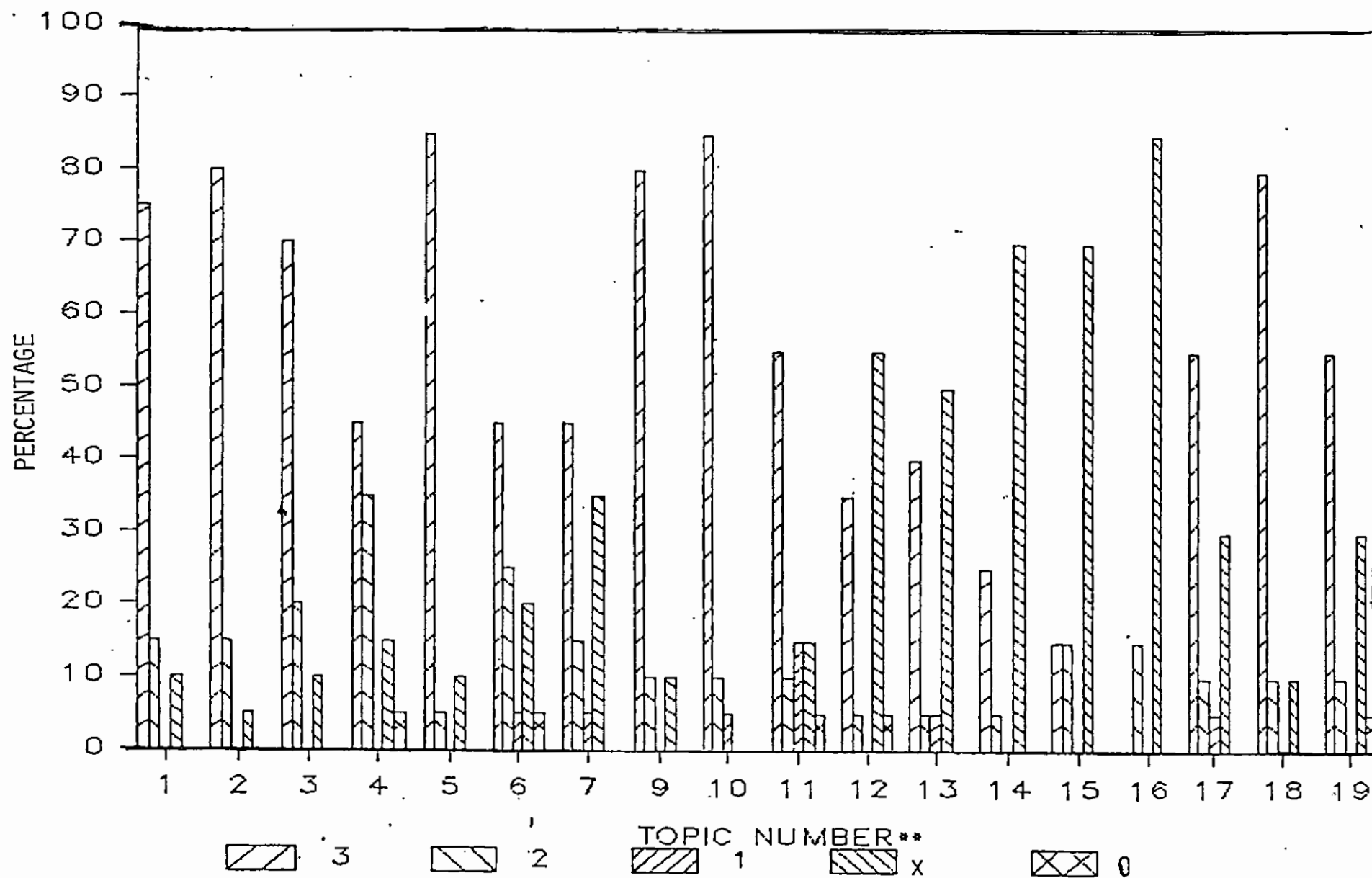
FIGURE 6.4: ASPIRATIONS CHANGES IN CHIEFS AND HEADMEN/WOMEN ABOUT TOPICS RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO, 1985



* FARMING SYSTEMS RESEARCH

** SUBJECT EQUIVALENTS TO TOPIC NUMBERS ON PAGES 273 AND 274

FIGURE 6.5: PRACTICE CHANGES OF CHIEFS AND HEADMEN/WOMEN IN TOPICS RELATED TO FSR* EXTENSION EDUCATION PROGRAMMES, LESOTHO 1985



* FARMING SYSTEMS RESEARCH

** SUBJECT EQUIVALENTS OF TOPIC NUMBERS ON PAGES 273 AND 274

and is motivating his people more effectively. He thinks this has been a great help. He also said that almost everything he learned helped him to apply new methods and approaches to his work which since seems to be going well.

Respondent 7 said he organized group meetings and used the knowledge gained from the courses; thus, his discussions were good. He also taught his people about the importance of fertilizers and encouraged fertilizer use. Some villagers are now doing so.

Respondent 10 said he has seen improvement in his neighbours' cattle. He also reported that his people have constructed many dams.

Respondent 17 said more of her people use fertilizers and certified seed. She likewise reported that the villagers understand and now practice rotational grazing. Finally she indicated that her people have built silt traps in many dongas and have also planted kikuyo grass.

e. Constraints to practice changes

Constraints to practice change were expressed freely by

respondents. Some were related to the non-learning/non-recall phenomenon described above. Others were voiced more in the context of frustration over not being able to apply new capabilities developed in the KASA change process.

Some of the constraints specified included the difficulty of promoting rotational grazing among people who don't understand the concept, young trees being destroyed by herdboys and animals, villagers not understanding grazing control regulations, lack of dissemination of range research results among chiefs, and quarrels among some farmer contact group members.

Yet other constraints were lack of knowledge by chiefs of agronomy research results, lack of knowledge about tree seedling procurement, incomplete understanding of stocking rate concept, inadequate comprehension of farming systems research concept, non-response to chiefs' leadership, frustration over non-function of the abattoir, and non-interest in forestry.

More constraints included the need to know how to care for young trees and incomplete understanding of chief's role in

agricultural development. While most of these constraints were voiced by individual respondents, the constraints to grazing control, stocking rate attainment, and/or rotational grazing were mentioned by 14 (70%) of the respondents.

6.6.5 End results

Of the 20 chiefs and headmen/women who participated in FSR extension education programmes, 19 (95%) are active in decision-making about agriculture. All 20 (100%) said they had benefited from these educational programmes and actively support farming systems research as a development strategy. Reasons stated in support of the latter included its problem-solving achievements, assistance in improving agriculture, interest in agricultural development activities, its extension education programmes, positive research results in the community, an eagerness for agricultural development in the nation, and a willingness to help people.

Other reasons given were the chiefs' interest in the fight against hunger, interest in community progress, greater interest in agriculture, enhancement of knowledge, eagerness to improve agricultural methods, and desire for area improvement.

6.6.6 Recommendations

Only 6 respondents (30%) offered recommendations on the FSR extension education programmes to date. One (1) felt there is a continued need for training on pasture management and improvement of livestock. Another (1) called for more education in forestry. Two (2) persons said that more training is needed on the Chieftainship Act of 1968. And, two (2) others stated an incongruency in extension education programmes for local chiefs and headmen/women and no such programmes for area chiefs.

6.7. SUMMARY

Chiefs and headmen/women from villages in farming systems research prototype areas participated in extension education courses in 1983 and 1984. A sample of 20 of these participants reported having experienced positive KASA changes in several subject matters, and having done so largely to a great extent. The same respondents indicated having also made selective practice changes in the same subject matters (topics) in their role as village leaders,

although there was more variability in the intensity of practice change. The subject matters taught which elicited such positive responses at these higher evidence levels, included leadership styles and communications, role of chiefs in agricultural production, role of farmer contact groups, role of chiefs as facilitators of groups, chiefs' attitudes toward agriculture, farming systems research concept, agronomy research in grain and crops, Chieftainship Act of 1968, grazing control regulations, rotational grazing, animal science in prototype areas, anti-erosion works regulations, and forestry/woodlot policies.

In contrast, consistently more than 50% of the respondents, the percentage sometimes rising to 85%, either failed to learn or could not recall the content of extension education in the topics of range research in prototype areas, stocking rates, livestock policy and production, importation of livestock and the abattoir.

From the data at hand, it is not possible to explain this contrast, and attempts to do so would result in educated guesses at best. Instructional effectiveness, quality of content, participants' interest levels, relevance of material, and participants' comprehension levels are

suggested as possible points of departure for further study of this phenomenon.

Important constraints to practice change were found in the areas of grazing control, stocking rate, and rotational grazing.

Despite the mixed KASA and practice change results, chiefs and headmen/women are active in decision-making about agriculture, benefited positively from FSR extension education programmes and actively support farming systems research as a development strategy. The consensus on these three points was total.

A third important clientele which participated actively in FSR extension programmes in Lesotho is comprised of district-based extension workers and subject matter specialists. The impacts of those programmes will be assessed next.

CHAPTER 7 THE IMPACT OF FSR EXTENSION EDUCATION PROGRAMMES ON DISTRICT-BASED EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS

7.1 EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS

The Lesotho Ministry of Agriculture and Marketing carries out its field operations largely through district-based personnel who work and reside throughout the ten administrative districts of the country. This cadre of agricultural workers, who report to a district agricultural officer, includes extension workers and subject matter specialists. Both of these groups are fundamentally important to agricultural development. Extension workers are engaged in extension education programmes directly with farmers on crop production, animal management, conservation and range issues. Subject matter specialists provide technical expertise and guidance for extension workers who are largely generalists. The latter may call on the subject matter specialist to address farmers directly on specific topics if the situation requires such direct exchange.

Most extension assistants, who are the front line field extension workers, hold the Certificate in Agriculture credential from Lesotho Agricultural College. This represents two years of general agricultural studies with basic instruction in extension methods. Other extension personnel, such as district extension officers may hold

Diplomas in agriculture from Lesotho Agricultural College or similar institutions, or may have simply worked their way up through the system without the benefit of additional formal education. Thus, it can be seen that the people with the least education and the least experience are the same people who are cast into the specific role of educating and advising farmers. As might be expected, this is not the ideal organization for diffusion of agricultural innovations.

Subject matter specialists are largely district-based as well. They bear such titles as district crops officer, district livestock officer, and so on. These officers tend to be more specialized than the extension workers. They may hold diplomas from Lesotho Agricultural College in general or specialized studies, or even the Baccalaureate degree from foreign universities. On the other hand, some may hold the same Certificate in Agriculture as the extension workers they must advise, and have acquired their "expertise" through exposure, experience or short-term participant training. Their principal role is to advise and train extension workers in technical subject matter. Their responsibility is to maintain professional currency in their respective disciplines.

In Lesotho an extension worker at the village level may be expected to provide education programmes for as many as 250

farm families. A subject matter specialist may expect to advise approximately 30 extension workers. These complementary efforts form the fabric of the principal diffusion network in Lesotho for agricultural innovation and development.

7.2 EXTENSION EDUCATION PROGRAMMES

The extension education programmes provided by farming systems research and extension personnel of the Research Division for extension workers fit that type described by Harbison (1973, p. 5) as "activities oriented primarily to develop the skill and knowledge of members of the labour force who are already employed".

In extension lexicon, such activities are variously known as continuing education, staff development, professional improvement, or in-service education programmes. By whatever name, the extension education opportunities provided for this clientele during 1982 through 1984 were based on systematic needs assessments and were designed to strengthen the professional currency of field officers through education in extension methods and technical agriculture.

This continuing education programme for district-based extension workers and subject matter specialists became an acquired role for farming systems research personnel because

of three prevailing conditions. First, the terms of reference for the principal researcher, who arrived in Lesotho in October 1981, specifically mandated the provision of "training and guidance to field extension staff in principles and methods of extension education to facilitate the transfer of research findings to village farmers, and to offer in-service training, as needed, to extension field staff ... who would benefit from an improved understanding of group processes, leadership techniques and communications. Presentation of project-provided information might also be included" (Bath, 1980, pp. 1 - 2). The second condition was the challenge tendered by the Principal Secretary of Agriculture in 1981 to extend the training and education capabilities of farming system research and the Research Division beyond the boundaries of the prototype areas. And, the third prevailing condition lay in the attachment of experienced and knowledgeable research and extension personnel, national and expatriate to the Research Division. These conditions provided for what was seen by the leadership of the Extension Division* of the Ministry of Agriculture as a valuable training and education resource within the ministry. It followed that joint conferences and planning sessions were held among members of the Research Division, the Extension Division and Agricultural Information Services in order to activate that resource.

* Before decentralization of this division

7.2.1 "Extension for improvement of farming systems"
course

(a) Introduction

In October 1981, the Principal Secretary for Agriculture and Marketing in Lesotho invited Farming Systems Research Project to extend its training capability beyond its prototype activities and beyond the confines of Research Division*. In terms of extension training and staff development, it became quickly apparent that the most fertile ground for sharing extension methods, techniques and skills adapted to the world of developing agriculture in Lesotho was to be found among the extension personnel already in the countryside. These personnel numbered 142 and were widely deployed throughout the ten administrative districts nationwide. Professional levels at MOA Headquarters included director, advisor, chief extension officer and senior extension officer. In the field, the professional levels were district extension officer, area extension officer and extension assistant. They were all supported by subject matter specialists who were then members of other MOA technical divisions.

(b) Development

The development phase of the proposed training involved two basic and very complex activities. Since all but six

* For Ministry of Agriculture personnel only, as stated in Chapter I.

members of the prospective trainees were employees of Extension Division and thus not under Research Division's jurisdiction, the director of extension, the chief training officer, and relevant MOA staff were consulted frequently during the development phase. Based on information on file elaborated by BASP and USAID advisors to extension*, augmented by the knowledge of research extension group members, a course syllabus was elaborated. This course syllabus was guided through all channels concerned by the research extension officer and the principal researcher. Concurrence on course content was secured from Research Division, farming systems research, chief training officer, Extension Division, director of technical services and the Principal Secretary.

Concurrence achieved, the commitment toward recruitment of trainees commenced. This was accomplished in five ways. The director of research communicated Research Division's invitation to the districts. The director of extension issued instructions to the districts for trainee selection.

It was jointly proposed by the principal researcher on assignment in Lesotho and the research extension officer that an extension training course be developed on a 15-day schedule for mid-level extension workers, namely area

* Needs assessments.

extension officers and research extension assistants. The proposal was approved by Research Division and supported by the FSR project director then on visitation in Lesotho. The proposal gained strong support of the directors of technical services and Extension Division as well as the chief training officer. The DAO's* likewise indicated support for procedures. Farming systems research agreed to sustain the costs of instruction. Research extension personnel travelled to each and every district securing commitments of DAO's and DEO's** to the process of trainee selection. Agricultural Information Service cooperated with local press and radio propaganda about the event, which was matched by Radio South Africa. Finally, thirty-one top candidates were designated as trainees.

The Mazenod conference centre, administered by the Roman Catholic Church, was selected as a training site. Well endowed with lecture hall, group discussion rooms, libraries, dormitories and mess hall and secluded in an attractive location miles from downtown Maseru, it proved to be an excellent choice.

* District agricultural officers.

** District extension officers.

The next task was to assign units of subject matter course content to the best resource people available. All members of the research extension and rural sociology groups agreed to teach. Assignments were likewise accepted by other research officers and all FSR team members. Further invitations to teach were extended to key officers in the Extension Division and to selected resource persons from the National University of Lesotho, Agricultural Information Service, and Conservation and Range Development Project, Conservation Division, FAO, Woodlot Project, BASP*, Renewable Energy Project, nutrition department and World Bank. All invitations were accepted without exception. The final syllabus was then duplicated and distributed, and periodic follow-up was done.

(c) Implementation

For eleven days in February 1982, thirty-one area extension officers and research extension assistants received instruction in extension for the improvement of farming systems. The course was opened by the director of technical services on behalf of the Principal Secretary for Agriculture. Instruction exceeded 80 hours and included such units as extension in Lesotho, understanding your

* Basic agricultural services programme.

organization, cultural implications for extension, lay leadership, communications skills, motivation, extension methods, teaching agriculture effectively, soils, animal science, agronomy, forestry, extension demonstration, field trip, programme development cycle, writing extension objectives, programme evaluation, appropriate technology in extension, farming systems concepts, roles of village agricultural committees, marketing, range management and farm management.

Course direction was provided by the research extension officer and the FSR extension specialist (principal researcher). Coordination and logistics were carried out by the research extension technical officer and the research extension assistant. Support and analysis were assisted by the research rural sociologist and assistant. The course was officially closed on February 26, 1982 by the Maseru district coordinator.

(d) Evaluation

A comprehensive evaluation instrument was devised and administered on the final day of the course. The participants themselves agreed to share their impressions

and assign values to the many components and aspects of the training.

Personal and group progress, as well as learning acquired, was rated medium to high. The trainers, along with training aids and techniques, were judged medium to high as well. Comparison to other training received was high.

Comments on course content were favourable but pointed out a need for more practicals to balance out theoretical instruction and mentioned the time constraint. It was generally felt trainers were helpful, but called on them to be more practical and allow themselves more time on each topic. The way trainers organized, planned and conducted the course made participants feel happy, satisfied and motivated.

Participants learned most from group discussions and from the farm machinery officer. Most felt they got from the course all they had expected. However, some wanted more horticulture and general practicals. Most popular topics varied widely, but communications skills was most popular followed by farm machinery. Least popular were once again scattered, but food preservation was least popular followed

by forestry. Learning preferences for the future seem to have a practical subject matter trend, mentioning such topics as ox-drawn farm machinery repair, farm machinery practicals, agronomy and soil sampling practicals. A like number, however, felt the current balance in course content to be satisfactory (Youmans and Sefeane, 1982, pp. 1 - 5). This initial extension education programme for district-based personnel was thus executed and evaluated through the first four evidence levels of inputs, activities, people involvement, and reactions as in Bennett (1980, pp. 4 - 13).

7.2.2 "Professional improvement in agricultural extension" course

(a) Introduction

The training of district extension officers in extension methods and techniques appropriate to developing agriculture and in up-dated technical agriculture subject matter was established as a priority need in 1981. While this need* was largely ascribed it was derived from a set of priorities developed earlier by the Extension Division itself in consultation with members of its several employee levels. Further, the nature of the need was refined by members of

*This need has as its basis the low productivity of Lesotho's farmers in both crops and livestock, along with related concerns.

the research extension component, in visitation to districts, with district personnel.

During the training course at Mazenod in February 1982 in "Extension for the Improvement of Farming Systems", research extension was encouraged by the director of extension services to include subject matter specialists in the July training on the rationale that at the district level, the work of the SMS* is extensional in nature while those same SMS's have not received training in extension skills and techniques. The combined rationale joined together the needs of DEO's** and SMS's and scheduled one week of intensive training in extension and a second week of technical agriculture instruction for a joint projected audience of 10 DEO's and 20 SMS's.

The objective for the course, then, was to enhance the extension skills and agricultural knowledge of DEO's and SMS's toward higher rural productivity in Lesotho.

* Subject matter specialist.

** District extension officers.

(b) Development

Development of the course was once again somewhat complex since it involved an audience other than the Research Division and clearances for released time had to be secured. The director of research was influential in that task. Additionally, as is the policy of Research Division, top quality lecturers were invited in order to augment the capability of research personnel. Course development ultimately included the consulting role and instructional expertise of a Washington State University consultant and the associated communications and travel arrangements required to integrate his contribution into course development and implementation. Logistics were problematic in terms of meeting place, timing and funding in that the pressure for released time for MOA personnel increased with the advent of other course offerings, and scheduling became very tight. Again, the director of research played an important supportive role in that connection. Double-booking at Mazenod required that the Research Division procure other conference facilities, in short supply in the Maseru area. The choice of Airport Hotel increased the training costs considerably, a consideration which had to be reconciled with Farming System Research Project budget capabilities.

The end of the development stage found the two-week course structured around a week of extension training and a second week of technical agriculture instruction at Airport Hotel conference facility for district extension officers and subject matter specialists. A variety of guest lecturers were invited to complement the resources of Research Division*.

(c) Implementation

An instructional course on "Professional Improvement in Agricultural Extension" started on July 12th and was terminated on July 24th. Five district extension officers and twenty-five subject matter specialists from all ten districts attended. The course was opened by the chief extension officer on behalf of the director of the Extension Division. The introductions were made by the director of research.

Basic extension instruction included the following units: philosophy of extension, programme development cycle, your agricultural career, effective listening, communication

* Professionals of the highest quality were enlisted from the the Lesotho Ministry of Agriculture, Washington State University. Land Conservation and Range Development Project and National University of Lesotho.

skills, extension management, the farming systems approach, cultural implications for extension, culture and values, needs assessment, writing extension objectives, demonstrations and field trips, motivation skills, lay leadership, training and visit system, interrelationship in agriculture, organising effective pitsos, the role of village agricultural committees and programme evaluation. Technical agriculture units included were: farm machinery, marketing, forestry, agronomy, plant protection, horticulture, soil conservation, animal science and range science (Matobo et al 1982, pp. 1 - 4).

(d) Evaluation

An evaluation of the workshop was planned and carried out since the organizers and coordinators of the workshop were interested in evaluating a number of key factors. These factors were:

- (1) overall quality of the workshop;
- (2) importance of workshop material to the participants;
- (3) usefulness of workshop material to participants;

- (4) overall effectiveness of the lectures;
- (5) effectiveness of teaching techniques;
- (6) lecturer effectiveness in helping participants learn;
- (7) effectiveness of small group activities;
- (8) effectiveness of visual aids;
- (9) effectiveness of handouts; and
- (10) participants' perceptions of the benefit of such training to other extension workers.

In addition, participants were asked to identify the three most useful topics from both the extension and subject matter training. A comparison of the above listed factors was made between week 1 and week 2 of the workshop.

Participants were asked to give their perceptions in terms of a rating for each factor. Data was aggregated for analysis.

Conference organizers fixed the criterion for success for each factor studied at 70 percent. In other words, if 70 percent of the responses fell at or above the satisfactory level, then the criterion for success had been met. For example, in question 1, 100 percent of the participants

rated the overall quality of the workshop for week 1 as satisfactory or higher. Thus the criterion for success was met.

The results of the ratings for the major factors comparing week 1 - extension training, and week 2 - agricultural subject matter are presented in abbreviated form.

1. Overall quality of the workshop - week 1 and 2

One hundred (100) percent of the participants rated both weeks as satisfactory or higher. Approximately 75 percent of the respondents evaluated the quality of both week 1 and 2 as excellent or outstanding.

2. Importance of workshop materials to the participants' jobs

One hundred (100) percent of the respondents rated this factor as important or higher for week 1 and 96 percent as important or higher for week 2. A total of 94 percent of the participants rated week 1 as critical or very critical and 73 percent rated week 2 at that level. More DEO's and SMS's appeared to feel that the extension training was more critical for their jobs.

3. Usefulness of materials to participants when they return home

Ninety (90) percent of the respondents indicated the usefulness of the extension materials covered as very useful and 80 percent indicated the agricultural subject matter material as very useful. Comments indicated materials related to job related needs of the extension staff and those of farmers in their areas.

4. Effectiveness of the lectures

Approximately 75 percent of the participants rated the lecturers for both weeks training as very effective. Participants reported that horticulture lecturers should stress the backyard and middle farmer rather than commercial farmers.

5. Effectiveness of teaching techniques

Approximately 70 percent of the respondents indicated the effectiveness for both weeks as very effective. However, 18 percent of the extension workers indicated teaching techniques for week 2 as not effective as opposed to only 5 percent for week 1. A number of participants indicated that more demonstrations, field visitations, and visual aids should be used.

6. Lecturer effectiveness in helping participants learn new skills and ideas

This question is closely related to number 4. The difference relates to the lecturers' ability to help participants learn new ideas and skills. A total of 97 percent of the respondents indicated the lecturers from week 1 as being effective or very effective in helping them learn new ideas and skills. This contrasted to 89 percent who indicated lecturers from week 2 as being effective or very effective.

7. Effectiveness of small group activities in helping participants learn new skills and ideas

There were more small group activities used during extension training. Eighty-seven percent of the participants rated the effectiveness of small group activities during week 1 as very effective as contrasted to 79 percent for week 2.

8. Effectiveness of visual aids in helping participants learn new knowledge

Ninety-one (91) percent rated the effectiveness of visual aids used during week 1 as effective or higher as contrasted to 93 percent for week 2.

9. Effectiveness of handouts in helping participants learn new information

Eighty-seven (87) percent of the extension workers reported the handouts used in week 1 as being very effective in helping the participants learn new information. This compared with 80 percent for week 2.

10. Participants' perceptions of the benefit of the training for other extension workers

All the participants felt that the extension and agricultural subject matter training would be beneficial to other extension workers.

11. Three most helpful topics identified by the participants

Each extension worker was asked to name the three most useful extension and agricultural subject matter topics covered in the course. Extension topics most frequently mentioned were:

motivation skills (19), communications skills (17), programme development (15), extension management (11), and philosophy of extension (9). Agricultural topics most frequently mentioned were: animal science (16), plant protection (12), range management (11), marketing (11), and

farm machinery (11). Respondents indicated helpfulness was defined as new information relating to their professional needs. Briefly, the criterion of 70 percent to judge the success of the workshop was met and exceeded in all cases. Based on this evidence one can make the judgement that both the extension and agricultural subject matter segments of the workshop were successful.

A second part of the evaluation was to assess a number of other factors involved in the workshop. Participants were asked to evaluate the overall effectiveness of the two week educational endeavour.

1. Participants' assessment of the organization of the workshop

Seventy-three (73) percent of the participants felt that the organization the workshop was outstanding.

2. Participants' assessment of conference facilities

Thirty-seven (37) percent rated the facilities as outstanding and sixty-three (63) percent as satisfactory.

3. Teaching effectiveness of the lecturers

This was a question double checking participant perceptions

of teaching effectiveness in week 1 and 2. A total of seventy-four (74) percent of the extension workers rated lecturer effectiveness as very effective. Some participants indicated some lecturers could use better techniques.

4. Participants' assessment of the value of information, ideas, and skills learned during the workshop

Ninety - one (91) percent of all participants reported receiving some assistance or great assistance in terms of this factor.

5. Participants' assessment of personal progress toward learning new ideas and skills during training

Seventy-seven (77) percent of the participants indicated making good or excellent progress toward learning new ideas and skills during the training.

6. Participants' assessment of knowledge and skills gained during the workshop compared to previous knowledge and skill base

The results from this question were consistent with participant ratings of personal progress in the workshop. All participants reportedly gained knowledge and skills.

By any standards, the course was a success as judged by the participants in terms of all the significant factors. There was relatively little difference between the factors studied in terms of the extension and agricultural subject matter

training. A slightly higher percentage of the respondents gave an edge to week 1 in terms of: (1) importance of workshop materials to the participants' jobs (2) effectiveness of teaching techniques and (3) effectiveness of small group discussions.

This type of evaluation is limited to determining participant perceptions. These perceptions are mainly reactions to factors addressed in the questionnaire. Some assessment of participant attitudes is covered, primarily in a quantitative manner. Some qualitative data is provided via comments. Some evaluative feedback in terms of self-perception of knowledge and skills is also gained.

Conference coordinators observed that the participants practiced some skills and application of principles during small group discussions. This was specifically observed as part of the programme planning session where participants in teams of six developed a plan of work following the seven basic steps of the programme development cycle.

General recommendations from the participants for future courses included:

- (1) Include district extension personnel in an assessment of their training needs as a prelude to developing

course content;

- (2) Provide training to lecturers to improve their techniques and use of visuals;
- (3) provide more opportunity for participants to have "hands-on" experiences, field trips to relevant projects, opportunities to practice skills, and become involved in more active participatory work;
- (4) Schedule workshops of this type on an annual basis;
- (5) Consider training on a district or multi-district level, and
- (6) Provide similar training for other MOA officers (Matobo et al, 1982, pp. 4 - 12)*.

* A more in-depth evaluation of this course was prepared immediately following its closure (Matobo and Trail, 1982).

Evaluative data supplied by Matobo et al 1982 used by permission of co-authors.

7.2.3 "Plant and soil science subject matter specialists' training" course

(a) Background

In July of 1982, twenty-six subject matter specialists were brought together in Maseru for a two-week training course denominated "Professional Improvement in Agricultural Extension". Subject matter specialists are those district-based staff of the Lesotho Ministry of Agriculture who frequently hold the Diploma in Agriculture from Lesotho Agricultural College, who have specialized in a given technical agriculture field and who provide subject matter support to extension personnel in the field. The instruction given in 1982 was thoroughly evaluated not only in terms of course content and impact but also with respect to perceived and continuing education needs (Matobo and Trail, 1982).

Much deliberation was given over to those studies during the ensuing months and the outcomes were reflected in the research extension section's work plans for 1983 - 1984. In the meantime the Extension Division of MOA performed both formal and informal field-based assessments of productivity

of field workers and their needs. Coming together at year's end, personnel from both Research Division and Extension Division of the Ministry of Agriculture and Marketing began to jointly plan continuing education and training events which would address the needs of subject matter specialists, and they did so on a national basis.

The FAO support staff for forestry in Lesotho and the Land Conservation and Range Development Project, along with their counterparts in MOA, pursued parallel plans to educate subject matter specialists in their respective subject matters. Much interdisciplinary work, formal and informal, resulted in FAO's jointly-sponsored forestry course, LCRD's* decision to proceed with a range and livestock course and Research Division's determination to give a mid-1983 short course for plant and soil science subject matter specialists. The research extension section provided the leadership and organizational expertise for this effort in cooperation with Extension, Conservation and Crops Divisions with logistical support from LAC.**.

* Land Conservation and Range Development.

** Lesotho Agricultural College.

(b) Implementation

The week of August 1 - 5, 1983 was selected as the most appropriate time for the course as it is after vacations, during the annual break at LAC and just prior to planting season. LAC was selected as the venue because of its proximity to Research Division, its relative economy, and its mandated role in the continuing education of agricultural professionals. Also, LAC is able to provide dormitory and dining services in addition to instructional facilities and farm equipment. Extension Division personnel continued to assist research extension people in the design of course and instructional strategies. Research Division was called on to provide most of the instructional faculty, although both Crops and Conservation accepted and delivered two key lecturers. The faculty was composed of both national and expatriate professionals.

(c) Participants

Twenty-seven (27) subject matter specialists attended the course during the entire week. They were representative of all ten districts in Lesotho and of the several field disciplines related to plant and soil science. Most were holders of the Diploma in Agriculture, although a few were Certificate people. Twenty-three (23) participants were

men, and four (4) were women. Most made use of the facilities at LAC including the dormitories and dining rooms, while a few lodged with relatives in Maseru. All transportation, food and lodging was financed by Farming Systems Research Project. Participants enjoyed the lecture hall facility at LAC for course opening and closing ceremonies, but elected to attend the majority of instructional events at the Research Division conference room.

(d) Curriculum

A representative of Crops Division was invited to open the course while the director of research gave the orientation. Agronomy research lectured on soil fertility and fertilizer calculations while the deputy director of research delivered material on recommended agronomy varieties of maize, sorghum, wheat, beans and lentils for the mountains, foothills and lowlands of Lesotho. Horticulture research lectured on the recommended varieties of winter and summer cabbages for the lowland, foothills and mountains and shared information about cultural operations for the recommended varieties of tomatoes. The director of research gave a three part lecture and one field demonstration on potato production.

Extension research lectured on continuing education for agricultural professionals and education formulae for solution of farmers' problems. Crops Division gave a day-long presentation on farm machinery, both in the classroom and on the land. Extension spoke about administrative matters in MOA and extension workers as facilitators. Extension research instructed on group dynamics and group process.

Conservation delivered a comprehensive presentation on soil characteristics. Soil research shared responsibility for information on soils and soil sampling techniques. Extension research lectured on organizational and maintenance of farmer contact groups. Agronomy research contributed valuable information on weed control, utilizing herbicides as well as manual and mechanical control measures. Farm management research spoke on tree fruit budgets and marketing research addressed marketing of vegetable crops.

(e) Evaluation

Extension research administered an evaluative instrument designed by that section which also compiled and analyzed the

data. The evaluative outcomes follow.

Respecting the strengths of the course, 17 participants found the lectures good, 19 felt that the discussion periods were most valuable, and 14 judged the instruction (in whatever form) excellent. There seem to be no really significant differences in these responses other than to take the signal to provide more and longer discussion periods in future courses.

Participants expressed their evaluations of topics taught. Horticulture (19) and soil fertility (17) were clearly favourites, while extension (11) and agronomy (11) were also favourably received. Soil conservation (6) and weed control (6) drew good response, and farm machinery (5), marketing (5) and farm management (5) sustained mild interest.

Reviewing what participants saw as course weaknesses, a few expressed no weaknesses. This sort of response was interpreted as a gesture of kindness to course organizers. Some singled out certain lectures as not well prepared. This may be true or may have reflected a discomfort with a questioning type of lecture delivery where part of the responsibility of the learning experience was placed with

the participant. Many participants felt the time was too short. This is likely a valid point since so many deliveries were cut short and/or time for discussion was not available. Certainly subsequent short courses for SMS's should be two weeks long or shorter courses should be district based.

Some participants said they were not given hand-outs, lecturers were not punctual, and lecture preparation was poor. Mention was made of lecturers losing tempers when questioned. While all of these may be valid observations, they represent individual and not collective commentary.

So far as suggested improvements are concerned, most participants felt that an SMS course must be of two week duration, with practicals.

Respecting knowledges yet required at the end of the course (which might guide subsequent course content), participants expressed a continuing need on a declining scale as follows: agronomy (8), soil fertility (8), horticulture (5), extension (4), farm machinery (4), soil conservation (3), weed control (2), marketing (2), fodder production (2) and farm management (1).

Some participants wanted similar training to be conducted on a district level and others wanted to learn methods of approaching the extension assistants with SMS assistance.

On balance, the course seems to have demonstrated strength of both content and delivery. There were some weaknesses to be corrected or avoided. There was a clear indication of materials to be included in subsequent courses along with some good suggestions on instructional strategy (Youmans 1983, pp. 2 - 6).

7.2.4 "The Extension Challenge": A course in extension methodology for district extension workers and subject matter specialists

(a) Introduction

After considerable reflection on the evaluative outcomes of earlier extension and subject matter specialist training, a field-based needs assessment was carried out country-wide between August 29 and September 28, 1983 in order to determine the extent and legitimacy of the oft-repeated request for district-based training in extension methods and practitioner skills. That needs assessment was also useful in determining the concise areas in extension methodology of

greatest concern to field-based extension workers and subject matter specialists. Comprehensive responses were collected from Maseru, Mohale's Hoek, Berea, Butha Buthe, Qacha's Nek, Thaba Tseka and Leribe districts.

Extension Division personnel, along with representatives from Agricultural Information Services, were invited to screen the results of the needs assessment, help decide if country-wide training was in order, and assist in curriculum development.

The assessment was clearly positive and it was decided that Research Division farming systems research would undertake such training on a national scale*. The scheme was presented to MOA and approved by the director of technical services. It was then forwarded to all district agricultural officers for indication of their willingness to provide the required venue, administrative support and released time in their respective districts. Ultimately, all ten districts responded positively, and the following schedule was released:

* It was determined that the need for extension training based on the urgency to improve national farm productivity was not being met, and FSR/E and Research Division Colleagues were called upon to conduct the training nationwide.

November 28 - December 2, 1983	... Qacha's Nek
December 6 - 9, 1983	... Mokhotlong
January 24 - 27, 1984	... Thaba Tseka
January 30 - February 2, 1984	... Maseru
February 27 - 29, 1984	... Berea
March 14 - 16, 1984	... Butha Buthe
March 19 - 21, 1984	... Mafeteng
March 27 - 30, 1984	... Leribe
April 3 - 6, 1984	... Mohale's Hoek
April 25 - 27, 1984	... Quthing

(b) Logistics

The logistical arrangements involved RD/FSR's* willingness to provide the instruction, pay the travelling costs of RD/FSR faculty and reimburse the R3 subsistence cost per day per out-of-district-seat participant. The districts agreed to provide a classroom at each site and to facilitate maximum participation by field-based personnel.

(c) Instruction

RD/FSR formed the travelling faculty to include the director of research, deputy director of research, research extension

* Research Division/Farming Systems Research.

officer, expatriate extension specialist, research extension technical officer, research extension assistant and research livestock officer. Two officers from Agricultural Information Services were invited to participate at their own expense. The curriculum was developed to contain instruction on:

1. relation of research to extension,
2. needs assessment techniques,
3. group process and dynamics,
4. organization and maintenance of farmer contact groups,
5. communication skills,
6. extension teaching methods,
7. visual aids,
8. motivation, and,
9. evaluation.

Evaluative instruments were developed in order to determine accomplishments.

(d) Implementation

In November, the schools were launched and, by April, had been conducted in all ten districts in Lesotho, the first nationwide programme of its kind. A total of 272 extension workers and subject matter specialists were trained, and the research extension section gained national acclaim for this singular effort. They then conducted an eleventh school for National Family Planning, with 20 students in attendance, at which were addressed the issues of:

1. group process and dynamics,
2. role of the field educator,
3. the communications process, and
4. the important of reporting,.

(e) Evaluation

The effectiveness of the schools as perceived by the field extension workers was determined by asking them to identify the strengths and weaknesses of the school, if subject

matter was relevant, and how future schools could be improved.

The schools' strengths that were identified by the participants are shown in Table 7.1. These show a strong interest by the extension field workers in becoming more effective in meeting the needs of their clientele. The five strengths of the school most often cited dealt directly with improving personal capabilities and programmes. In contrast, only 4% considered the segment on the relation of research to extension a strong point of the schools. The fact that 90% of all participants completed a list of strengths is an indication of the high level of interest.

The weakness that was identified by 30% of the extension workers was that the schools' duration was too short. Thirty-one (31) percent indicated the school had no weakness. Lectures being too long was cited as a weakness by 6.0% of the participants. No other particular weakness was cited by more than 2,5% of the extension workers.

One-hundred-thirty-seven (137) responses (48,4%) indicated that the school addressed matters of real concern to them and their programme. Four (1,4%) indicated it did not contain relevant material.

TABLE 7.1** STRENGTHS OF EXTENSION SCHOOLS,
LESOTHO, 1985

Strength	Response Percentage*
Needs assessment techniques	28
Extension teaching methods	26
Communications skills	23
Motivation skills	22
Group process and dynamics	18
Effective listening techniques	12
Contact groups	11
Audio/visual aids	11
Relation of research to extension	4

* Percentage shown is based on number of responses (283).
Each participant was allowed to identify more than one
strength.

** Table reproduced by permission of authors
Youmans, Ramakhula and Lee (1985)

Lengthening the duration of the schools was the most often recommended method of improving the instruction (17,3%) and including the same course twice a year was second (9,2%). Having a follow-up course and holding the course in Farmer Training Centres were two suggested improvements identified in 5% of the responses, although most courses were held at FTC's.

A second phase of the evaluation was designed to determine what extension methods field workers preferred in working with people in their districts. This was done by having them select in order of preference 5 of 21 extension methods. The results are shown in Table 7.2.

Participating extension workers chose farm and home visits as their favourite method of transferring information. It was ranked in the top 5 of 21 choices by 91% of the agents and 62% placed it in 1st place. It was the only individual contact method that was highly regarded. The second choice in that category, informal contacts, was placed in the top 5 by 13% of the respondents.

Overall, group contacts were preferred to either individual or mass media approaches. The six methods classified in

this category received 47,2% of the possible choices compared to 25,2% for the 5 individual contact methods (18,2% was for farm and home visits), and 27,6% for the 10 mass methods.

Use of demonstration was the most popular group contact method with 70% of the participants ranking it in the top 5, and 55% placing it in the top 3.

TABLE 7.2***: SUMMARY OF RESPONDENTS' PREFERENCE OF EXTENSION METHODS IN PERCENTAGES*, LESOTHO, 1985

Methods	RANKING				
	1	2	3	4	5
(Individual)					
Farm and home visits	62	9	9	6	5
Office calls	0	5	1	3	3
Telephone calls	0	0	1	0	0
Personal letters	**	3	3	1	2
Informal contacts	1	4	1	4	3
(Group)					
Meetings	14	22	8	6	4
Demonstrations	9	22	24	9	6
Tours, field trips	2	4	9	11	8
Group discussions	3	14	11	11	6
Extension schools	**	4	2	5	6
Farmer training centres	0	1	3	7	5
(Mass)					
Posters	1	4	7	5	7
Exhibits	1	1	4	7	11
Newspapers	0	1	2	2	4
Wall newspapers	**	**	0	2	2
Folders, leaflets, pamphlets	0	0	1	2	1
Fact sheets	0	0	1	**	1
Projected visuals	1	**	0	**	3
Radio	4	6	9	12	17
Television	**	0	0	1	0
Campaigns	0	**	5	5	8

* Percentage based on total number of respondents, 272.

** Less than 0,5% (1 person) preferred this method.

*** Table reproduced by permission of authors Youmans, Ramakhula and Lee (1985).

The use of meetings as a teaching method was placed in the top 5 categories by 54% of the extension workers, group discussions by 45%, and tours and field trips by 4%.

The use of radio was the most popular choice of the 10 mass methods with 48% of the respondents placing it in the top 5. The use of posters and exhibits were both ranked in the top 5 by 24% of the participants. These three methods were in the top 5 choices because of the number of persons that ranked them in 3rd, 4th or 5th place.

To determine if geographical location influenced preference of methods, an analysis was made of how extension workers from each of the ten (10) districts ranked the 6 most popular methods. The number of respondents who ranked farm and home visits, demonstrations, meetings, group discussions, tours and field trips, and radio in their top 3 choices was calculated. This represented 80,7% of possible choices for 1st, 2nd, or 3rd rankings. Results of this analysis are shown in Table 7.3.

There were no differences found that could be attributed to geographical location. Most of the districts followed the overall pattern, farm and home visits in first place,

demonstrations and meetings a close 2nd and 3rd, and group discussions, radio, tours and field trips in 4th, 5th and 6th place, respectively.

TABLE 7.3**: PREFERENCE OF SELECTED EXTENSION METHODS BY DISTRICTS, LESOTHO, 1985

District	Methods *					
	F & H Visits	Demo	Meetings	Group Disc	Tours	Radio
Maseru	68	58	48	6	16	29
T Y	88	61	27	39	19	21
Leribe	91	51	42	27	12	6
Butha Buthe	93	55	35	55	17	10
Mafeteng	67	56	72	17	17	22
Mohale's Hoek	65	85	40	10	20	10
Quthing	57	57	38	29	19	29
Qacha's Nek	91	39	57	35	4	30
Thaba Tseka	78	46	49	22	11	22
Mokhotlong	87	67	53	7	27	13

* Values listed represent the percentages of respondents in each district that ranked these 6 methods in their first 3 choices.

** Table reproduced by permission of authors Youmans Ramakhula and Lee (1985).

Exceptions were Butha-Buthe and T Y that preferred group discussion to meeting. Also two districts in the southern part of the country, Mafeteng and Mohale's Hoek, ranked farm and home visits lower than the average and demonstration or meetings considerably higher than the average. The extension agents at Quthing as a group gave farm and home visits the lowest ranking of any district (57%). Reasons for the difference among districts could not be determined from available information, however, it is very likely previous experience of extension workers influenced their choice of methods.

(f) Conclusions

Reflections on both process and evaluation elucidated a number of brief conclusions. Extension and other district-based personnel of Lesotho's Ministry of Agriculture needed and responded positively to a programme of continuing education. High levels of attendance and evaluative response were experienced. The similarity of evaluative responses from all districts regardless of population or location was notable.

The schools seem to have been valuable in terms of overall

continuing education needs of the ministry as borne out by the comments respecting improvements for the programme. Those constructively critical remarks provided a valuable information base for planning subsequent educational experiences (Youmans, Ramakhula and Lee, 1985).

7.2.5 Continuing programmes

The 1984 - 1985 programme year saw an on-going programme of ten agricultural schools organized by extension research/FSR personnel in cooperation with Research, Range, Conservation and Livestock Divisions plus the Land Use Planning Section of the Ministry of Agriculture (Sefeane and Ramakhula, 1985). The outcomes of this programme do not fall within the scope of this study.

The above represents a detailed report of the extension education programmes executed by the Research Division in the FSR context in response to the continuing education needs of district-based extension workers and subject matter specialists. These programmes have been adequately evaluated through the first four evidence levels of inputs, activities, people involvement and reactions as per Bennett (1980).

7.3 THE RESEARCH PROBLEM

Regardless of the information known and documented above, the Research Division and the FSR project need to further ascertain the impacts of these extension education programmes at the upper three evidence levels. Otherwise stated there is a need to know the perceived changes in the KASA realm (knowledge, attitudes, skills and aspirations) in professional practice, and in end results which have occurred among extension workers and subject matter specialists as a result of having participating in the FSR extension education programmes.

7.4 METHODOLOGY

Again the reflective appraisal of programme (RAP) methodology will be used to accomplish this investigation as described by Bennett (1982). As has been seen this approach to the study of clientele-perceived results of extension programmes is a state-of-the-art methodology which employs an interview/questionnaire based on standardized but modifiable questions designed to elicit reflective perceptions from people about extension programmes in which

they have participated. Building on works about analysis of impacts (Bennett, 1976) and evidence levels (Bennett, 1980), RAP seeks subjective evidence about extension programme outcomes which may be quantified and analyzed like any other data. Far from being apologetic about the subjectivity of the raw data, proponents of RAP argue that all learning is perception and the most common way to find out what people have learned and how they have changed as a result of having participated in extension programmes is to ask them.

RAP enables extension practitioners to evaluate their own programmes by means of reflective perception determinations. It recognizes the danger of bias in subjective evaluative methods and seeks to prevent and/or reduce the sources of same by careful selection and training of evaluators, restricting the scope of RAP studies, expanding the standardized core of the RAP methodology as required to add substance to the data, use of probe questions to clarify or verify standard answers, and encouraging balanced presentation of negative as well as positive probe responses.

RAP allows for the use of interviews, review and analysis of documents, observation, and expert opinion, as well as

questionnaire data, in the interpretation of findings. All these alternative methods will be amply used in this study.

The steps in the RAP process include developing a rationale for evaluating extension education outcomes, selecting a programme for study, identifying the consumers and users of a RAP study, defining the scope of the study, identifying the interviewers, preparing the data collection instrument, interviewing the participants, analyzing and presenting the findings, making conclusions and recommendations, and communicating the findings.

Any number of the data interpretation procedures are available to the RAP researcher. Bennett, (1976) speaks of proxy measures, field experiments, matched set designs, time-trend studies*, before-after studies, surveys, and case studies. These are, of course, complemented by several graphic techniques (Yang, 1955) and many statistical and computer-assisted techniques (Leedy, 1974). The choice of specific presentation techniques to be used in this chapter is associated directly with the characteristics of the data involved. They are described fully in section 7.6.

* Bennett earlier suggested ways of dealing with data collected on the same evidence levels used in RAP.

7.5 DATA COLLECTION

Central and critical to the RAP methodology and to this study is data collection and the design and use of the data collection instrument. Consistent with methodological guidelines by Bennett (1982), four questionnaires were developed in order to secure data at KASA (knowledge, attitudes, skills and aspirations), practice change and end results evidence levels, as per Bennett (1980), from participants in all four courses for extension workers and subject matter specialists described under 7.2. These were the Mazenod course, the Airport course, the RD/LAC course, and the ten district based extension schools.

On each questionnaire, the programme to be evaluated was briefly described and the purpose of the interview explained. A set of biographical data was collected. Inputs and people involvement were briefly reviewed. The content of each course was included to refresh recall and a validation of content included. A reaction question was asked along with a methods preference question. Essentially, this initial part of the questionnaire was designed to verify, validate and reconfirm information generally known about the extension education programmes.

Standardized but modifiable questions were asked on the content of each programme in order to determine changes in knowledge, attitudes, skills and aspirations (KASA), practice and end results perceived by participants as outcomes of the programmes. In all cases standardized responses were followed up by probe questions designed to clarify, verify or challenge the initial responses. Finally, recommendations for the improvement of the programmes were asked of each respondent. The instrument was developed in English and was tested with three participants and modified with respect to some biographical questions before its use in the field.

The principal researcher (white male expatriate FSR extension specialist) and the research assistant (a Mosotho female research assistant^{*}) conducted personal interviews and recorded all data on the questionnaire forms except the recommendations, which were written by the respondents themselves. The interviews were conducted in English between November 1984 and March 1985 concurrently with extension agricultural schools in the ten districts. The entire populations of the participants in the Mazenod, Airport, and RD/LAC courses were targeted for interviews

* Described earlier.

along with a sample of 67 persons of the 272 recorded full-time participants in the district-based extension schools. This sample was determined by selecting every fourth name on the full-name attendance lists. It was felt that there was essentially no difference between the expatriate male and the national female interviewer in terms of vested interest in programme outcomes, that the balance achieved between difference in sex, race, and culture was favourable and that responses to interviews were generally congenial and open.

By April 1985, completed questionnaires were in the hands of the principal researcher for presentation and further analysis. Of the 31 participants in the Mazenod course, 21 returned completed questionnaires. The 30 participants in the Airport course produced 20 respondents. A response of 18 was procured among the 27 full-time participants in the RD/LAC course. And of the target sample of 67 of the 272 full-time participants in the district-based schools, 47 rendered completed questionnaires.

7.6 PRESENTATION AND ANALYSIS OF DATA

In order to determine the impacts of FSR extension education

programmes on district based extension workers and subject matter specialists, the outcomes of the four separate courses described earlier in this chapter are assessed both individually and collectively. Biographical data are examined collectively to render a general profile of field staff. Information at the inputs, people involvement, and reactions levels is also seen collectively to draw some general deductions from that exercise. The activities themselves are analyzed separately for KASA and practice change findings since the audiences, course content, and expected outcomes are different. Examples of practice change and recommendations are again grouped since variability is not expected among the outcomes of the four courses. End results are neither compiled nor analyzed since end results of practice change implemented by extension workers and subject matter specialists can only become manifest in induced change among farmers and home managers. While there is some early evidence of such induced change in this chapter, the data are not conclusive.

7.6.1 Biographical data

Of the fifteen questions asked respondents in this general

category, just four were selected for further description. They are sex, age, length of ministry service and level of formal agricultural education. While some respondents are known to have attended more than one course, and may have thus rendered more than one completed questionnaire, their personal data is thought not to be significantly different from a like number of field workers who attended no course at all. Thus, no differentiation was attempted. Findings follow.

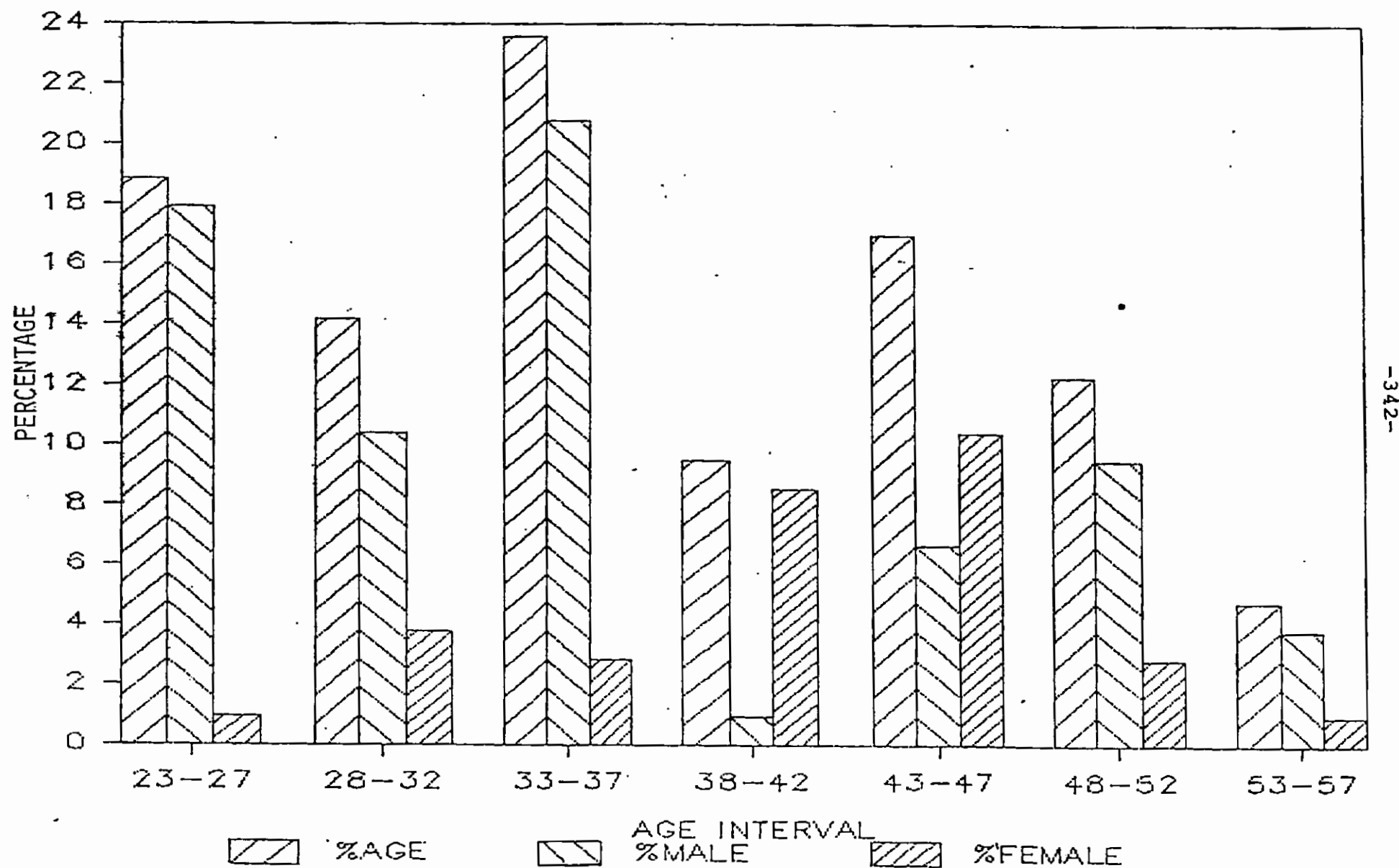
a. Sex

Of the 106 respondents, representative of participants in all four courses, 74 (70%) were men and 32 (30%) were women.

b. Age

The mean age for male participants was 40, while the mean age for females attending all courses was 31. The mean age of the total sample was 37. The most prominent age interval for all participants as well as men was 33 - 37. While the highest frequency among women was in the 43 - 47 interval. These data can be seen in Figure 7.1.

FIGURE 7.1: AGE CHARACTERISTICS OF EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS ATTENDING EXTENSION EDUCATION COURSES, LESOTHO, 1985



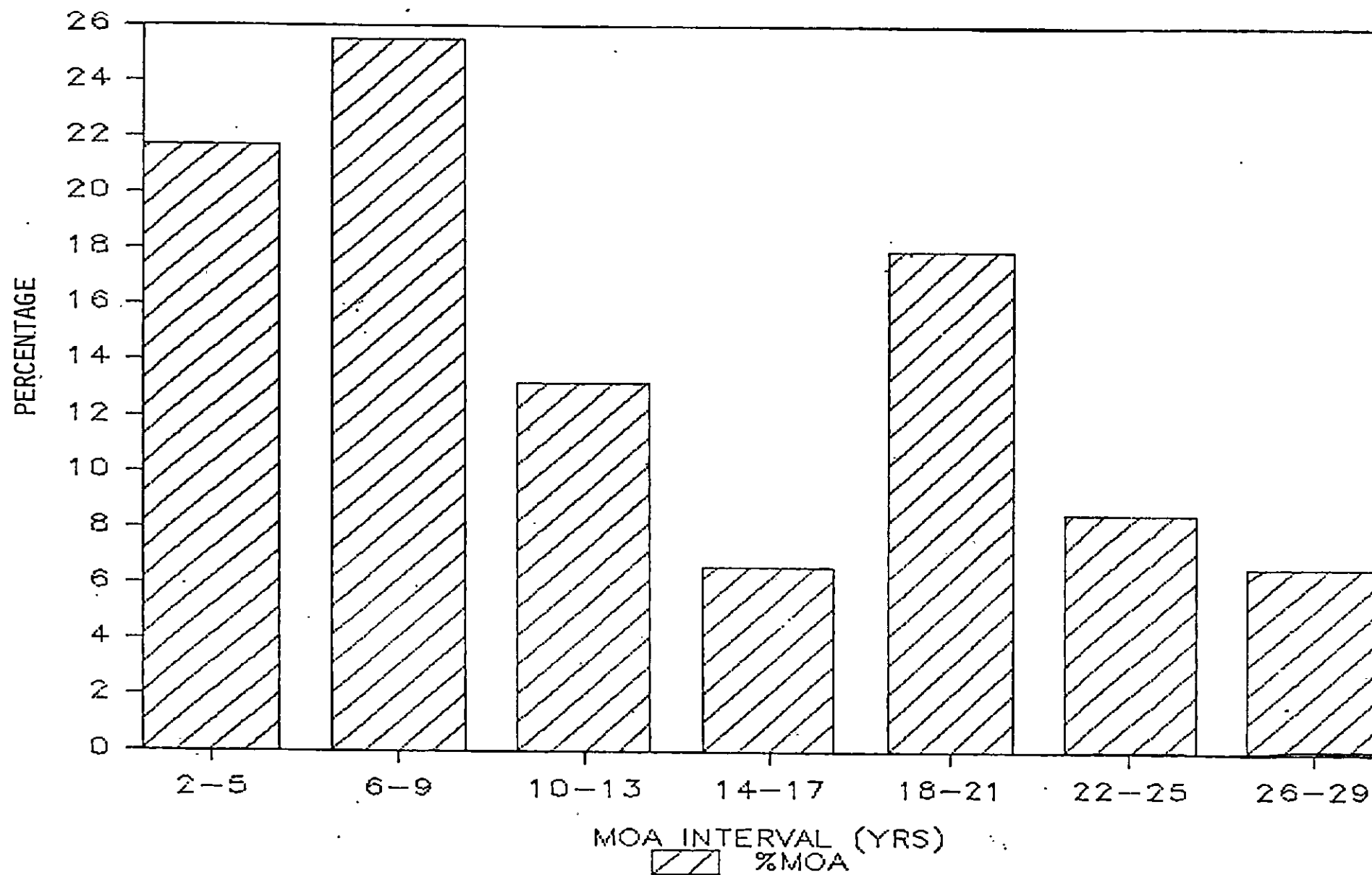
c. Years of service

Responding to a question in years of service with the Ministry of Agriculture, male participants reported a mean of 14,7 years, while females accounted for a mean of 7,2 years. Mean years of service for the total sample was 12 years. When MOA experience for all respondents is expressed in graphic percentages (Figure 7.2), it can be seen that most fall into the 6 - 9 year experience frequency with the 2 - 5 year frequency a close second. It is suspected that the high incidence of respondents in those frequencies is related to newly appointed extension assistants, among them many women. Interestingly, the third most populous frequency is that of 18 - 21 years of MOA service. Why it should exceed the 10 - 13 year interval, and dramatically surpass the 14 - 17 year interval, is not evident from the data at hand. Employment cycles by government in general and child rearing by women may have some influence on this configuration.

d. Formal agricultural education

Of the 106 respondents in the four samples 71 (67%) hold the

FIGURE 7.2: YEARS OF SERVICE WITH MINISTRY OF AGRICULTURE OF PARTICIPANTS IN EXTENSION CONTINUING EDUCATION COURSES, LESOTHO, 1985



Certificate in Agriculture credential and 33 (31%) have the Diploma in Agriculture (or in a specialized field). The two (2) others (2%) who hold neither of these credentials were older men who had begun their government service on the strength of secondary school qualifications. The vast majority of the credentials reported were from Lesotho Agricultural College.

7.6.2 Validation of course(s) content

Among the 106 total respondents, 54 (51%) said that according to their recollection of the course(s), the course content as described in the questionnaire(s) was accurate so far as they knew. Another 47 persons (44%) said the course content as described was reasonably accurate. Course content was not remembered by 4 respondents (4%).

7.6.3 Reaction level(s)

The sample was asked to what extent the course(s) met their expectations at the time. A majority of 69 respondents (65%) said the course(s) had met their expectations to a great extent. A second group of 28 persons (26%) reported that they had done so to a fair extent. Yet a third

sub-sample of 6 persons (6%) said their expectations had been met to a slight extent, while 2 persons (2%) didn't know.

7.6.4 Extension education methods

The 47 respondents to the district-based "The Extension Challenge" course (44%) were not asked to rate extension continuing education methods since their course employed but a single method, the illustrated lecture. However, the other 59 respondents were asked to rate their personal preferences among illustrated lectures, demonstrations, field trips, group discussions and audio-visual aids as instructional methods as applied to their own continuing education. The illustrated lecture was the preference of 26 respondents (44%), demonstrations were preferred by 14 (24%), field trips were the first choice of 13 people (22%), four (4) respondents (7%) chose audio-visual aids and a single (1) respondent (2%) preferred group discussions.

7.6.5 KASA and practice change for the Mazenod course

In order to interpret the KASA and practice change information in Table 7.4 and in Figures 7.3 - 7.6, the following keys are necessary.

a. Key to topics

1. Extension in Lesotho
2. Your organization
3. Cultural constraints
4. Lay leadership
5. Motivation
6. Programme evaluation
7. Appropriate technology
8. Agronomy
9. Soils
10. Forestry
11. Communications skills
12. Programme development cycle
13. Teaching agriculture
14. Village agricultural committees
15. Farming systems research methods
16. Farm management
17. Marketing
18. Range ecology

b. Key to responses

- | | |
|---------------------------|-----|
| - to a great extent | (3) |
| - to a fair extent | (2) |
| - to a slight extent | (1) |
| - don't know/don't recall | (X) |
| - not at all | (0) |

Response scores and their corresponding percentage values can be seen in Table 7.4.

TABLE 7.4: KASA AND PRACTICE CHANGE SCORES FOR EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS IN RAW RESPONSES FOR THE MAZENOD COURSE, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	12	7	1	1	0	10	9	1	1	0	9	8	3	1	0	12	8	0	1	0	7	10	3	1	0
2	9	6	4	2	0	6	11	2	2	0	7	9	3	1	1	13	3	3	1	1	4	13	1	1	2
3	10	7	2	2	0	5	10	3	2	1	6	9	4	2	0	7	9	3	2	0	8	8	3	2	0
4	10	9	1	1	0	11	9	0	1	0	7	11	2	1	0	12	7	1	1	0	8	10	2	1	0
5	14	4	1	2	0	13	6	0	2	0	12	6	1	2	0	15	2	2	2	0	9	7	3	0	2
6	8	8	4	1	0	9	9	2	1	0	5	11	4	1	0	13	5	2	1	0	5	9	5	1	1
7	7	8	2	4	0	7	8	2	4	0	2	10	5	4	0	7	6	3	4	1	2	9	4	1	5
8	10	8	0	3	0	11	7	0	3	0	9	7	2	3	0	11	7	0	3	0	8	10	0	1	2
9	7	6	7	1	0	8	7	4	1	1	7	5	7	1	1	8	6	5	1	1	5	4	7	2	3
10	6	6	8	1	0	7	8	4	2	0	6	8	4	1	2	8	6	3	2	2	6	5	4	2	4
11	17	4	0	0	0	17	4	0	0	0	17	3	1	0	0	15	5	1	0	0	13	6	1	0	1
12	5	5	4	7	0	6	8	0	7	0	5	7	2	7	0	4	8	2	7	0	4	5	5	3	4
13	11	6	1	3	0	13	4	1	3	0	10	8	0	3	0	14	3	1	3	0	9	8	1	2	1
14	12	6	1	2	0	13	5	1	2	0	11	8	0	2	0	12	6	1	2	0	7	10	1	1	2
15	10	6	2	3	0	11	5	2	3	0	10	6	2	3	0	11	6	1	3	0	6	7	5	2	1
16	4	10	4	3	0	7	8	3	3	0	6	9	3	3	0	8	6	4	3	0	4	8	5	2	2
17	6	5	6	4	0	4	7	5	5	0	3	7	7	4	0	4	6	6	4	1	3	5	5	2	6
18	8	5	5	1	2	11	4	3	2	1	4	8	6	1	2	5	8	5	1	2	2	8	7	1	3

TABLE 7.4: (CONT'D): KASA AND PRACTICE CHANGE SCORES FOR EXTENSION WORKERS AND SUBJECT MATTER SPECIALISTS IN PERCENTAGES FOR THE MAZENOD COURSE, LESOTHO, 1985

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	57	33	5	5	0	48	43	5	5	0	43	38	14	5	0	57	38	0	5	0	33	48	14	5	0
2	43	29	19	10	0	29	52	10	10	0	33	43	14	5	5	62	14	14	5	5	19	62	5	5	10
3	48	33	10	10	0	24	48	14	10	5	29	43	19	10	0	33	43	14	10	0	38	38	14	10	0
4	48	43	5	5	0	52	43	0	5	0	33	52	10	5	0	57	33	5	5	0	38	48	10	5	0
5	67	19	5	10	0	62	29	0	10	0	57	29	5	10	0	71	10	10	10	0	43	33	14	0	10
6	38	38	19	5	0	43	43	10	5	0	24	52	19	5	0	62	24	10	5	0	24	43	24	5	5
7	33	38	10	19	0	33	38	10	19	0	10	48	24	19	0	33	29	14	19	5	10	43	19	5	24
8	48	38	0	14	0	52	33	0	14	0	43	33	10	14	0	52	33	0	14	0	38	48	0	5	10
9	33	29	33	5	0	38	33	19	5	5	33	24	33	5	5	38	29	24	5	5	24	19	33	10	14
10	29	29	38	5	0	33	38	19	10	0	29	38	19	5	10	38	29	14	10	10	29	24	19	10	19
11	81	19	0	0	0	81	19	0	0	0	81	14	5	0	0	71	24	5	0	0	62	29	5	0	5
12	24	24	19	33	0	29	38	0	33	0	24	33	10	33	0	19	38	10	33	0	19	24	24	14	19
13	52	29	5	14	0	62	19	5	14	0	48	38	0	14	0	67	14	5	14	0	43	38	5	10	5
14	57	29	5	10	0	62	24	5	10	0	52	38	0	10	0	57	29	5	10	0	33	48	5	5	10
15	48	29	10	14	0	52	24	10	14	0	48	29	10	14	0	52	29	5	14	0	29	33	24	10	5
16	19	48	19	14	0	33	38	14	14	0	29	43	14	14	0	38	29	19	14	0	19	38	24	10	10
17	29	24	29	19	0	19	33	24	24	0	14	33	33	19	0	19	29	29	19	5	14	24	24	10	29
18	38	24	24	5	10	52	19	14	10	5	19	38	29	5	10	24	38	24	5	10	10	38	33	5	14

c. KASA change

It is clear that there is a great deal of variability in the KASA responses of this sample, indicating a more discriminating and demanding clientele. Scores still tended toward the "3" response level for most topics taught, although "2" responses appear in significant frequencies. There are also modest "1", "X" and "0" responses. The scores indicate generally that most respondents reported KASA gains to a great or fair extent. However, moderate numbers indicated slight or no gains with a few respondents claiming negligible recall.

The data indicate that very high KASA responses were reported by the Mazenod course clientele in such subject matters as communications skills, motivation, extension in Lesotho, village agricultural committees and teaching agriculture, while relatively few high responses were recorded for such instructional areas as farm management, programme development cycle and marketing. Moderately high responses were seen for a wide variety of topics to include cultural constraints, lay leadership, agronomy, farming systems research and the extension organization.

It is to be remembered that these scores relate to the

relative perceived gains made by participants in their knowledge, attitudes, skills and aspirations in the eighteen topics taught. The data can be seen graphically in Figures 7.3 - 7.6.

d. Practice change

Practice change scores for this same group can also be seen on Table 7.4. There is much more general variability in reports of practice change as compared to KASA change, with respondents indicating "fair" amounts of change in the greater number of cases. Practice changes reported as "great" were less frequent and moderate levels of "slight", "don't know" and "none" responses were seen. This is the expected configuration since practice change is known to be more difficult to achieve than are, for example, gains in knowledge and skills. Likewise, practice change among extension workers to a considerable extent, depends on the cooperation of their respective farmer clienteles. Practice change for subject matter specialists, similarly, depends on the receptiveness of extension workers.

The configuration again shows positive practice change in communications skills and extension organization, moderate change in extension, lay leadership, agronomy, teaching

FIGURE 7.3: KNOWLEDGE CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985

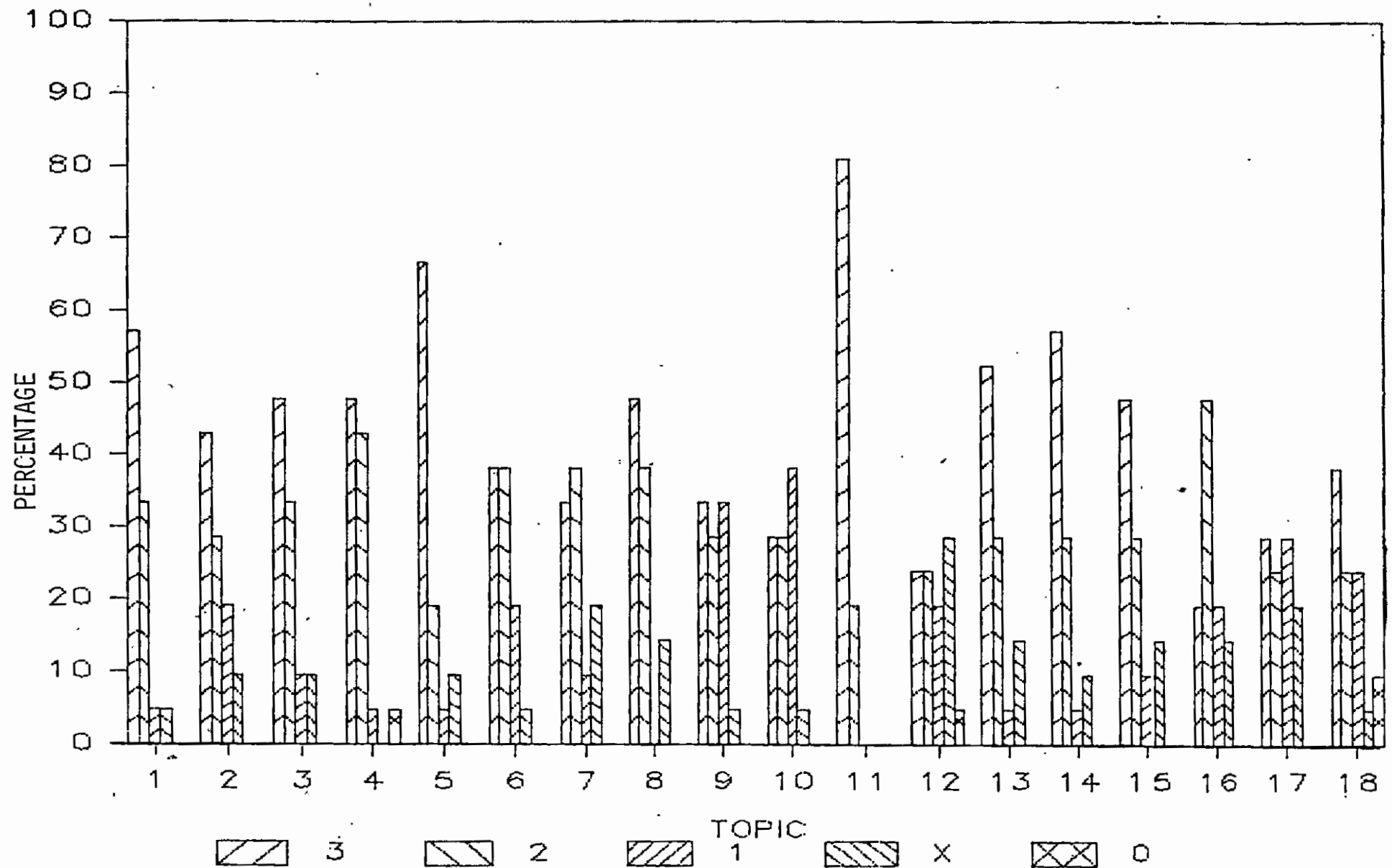


FIGURE 7.4: ATTITUDE CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985

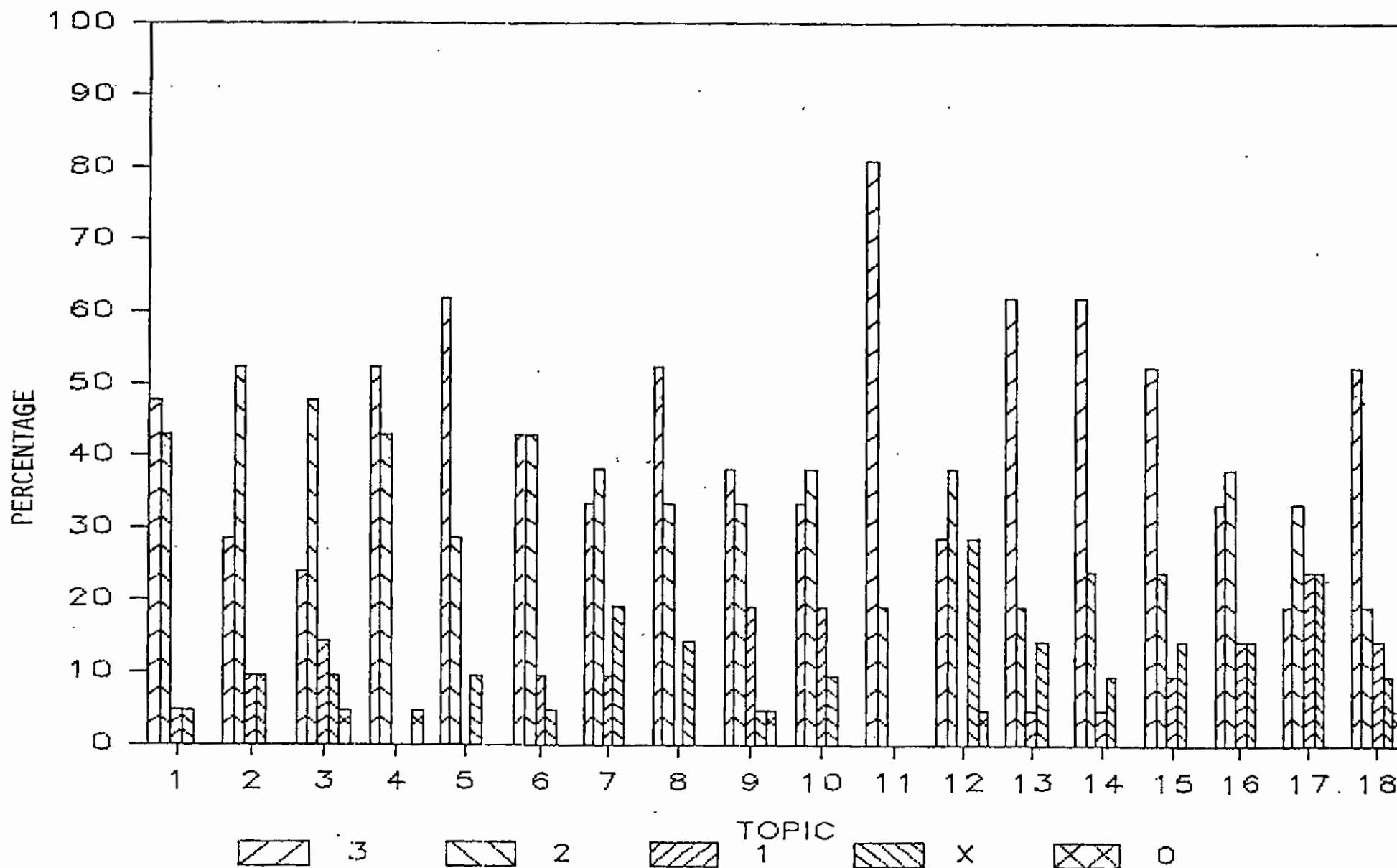


FIGURE 7.5: SKILLS CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985

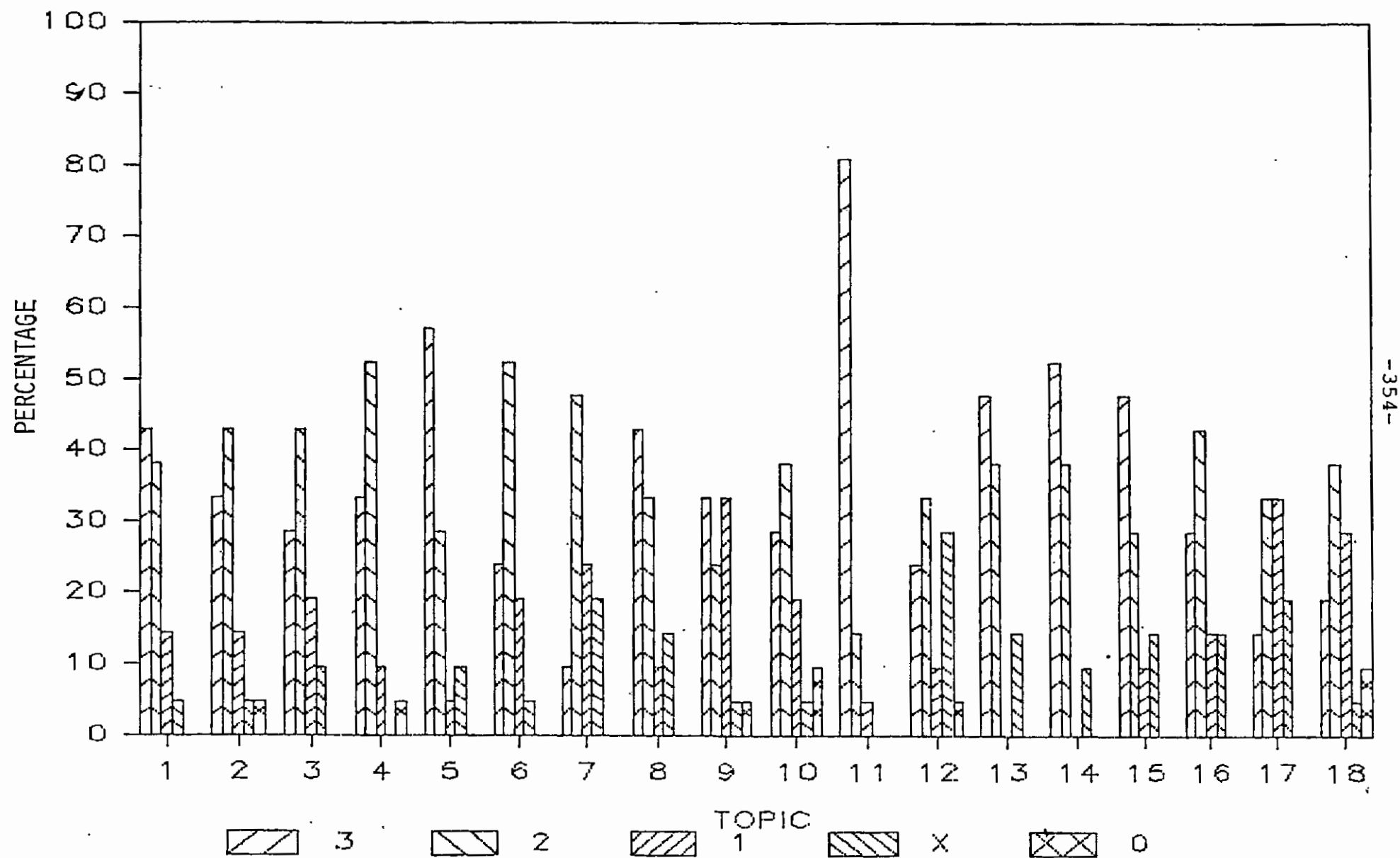
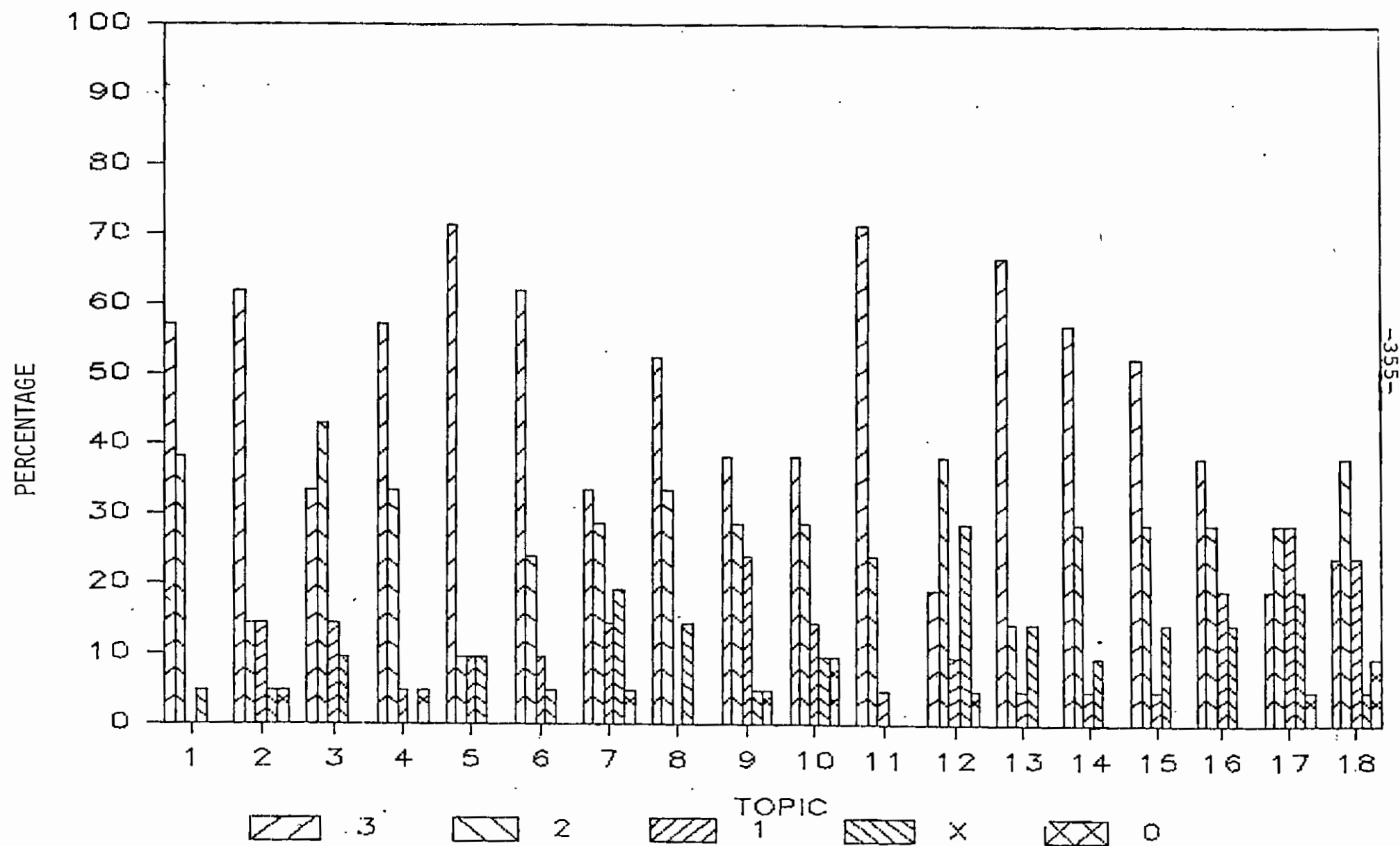


FIGURE 7.6: ASPIRATIONS CHANGE IN PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985



agriculture, and village agricultural committee work, and low change levels in forestry, programme development, and marketing. This configuration is seen on Figure 7.7.

7.6.6 KASA and practice change for the Airport
Hotel course

Again keys are required to interpret the data presented in Tables 7.5, 7.6 and 7.7 and Appendices B.10 - B.19.

a. Key to subject matters

1. Philosophy of extension
2. Agronomy in Lesotho
3. Effective listening
4. Extension management
5. Cultural implications
6. Writing extension objectives
7. Motivation skills
8. Training and visit system
9. Village agricultural committees
10. Interrelationships in agriculture
11. Farm machinery
12. Forestry
13. Plant protection
14. Animal science
15. Horticulture

16. Programme development cycle
17. Your agricultural career
18. Communications skills
19. Farming systems research
20. Needs assessment
21. Demonstrations and field trips
22. Lay leadership
23. Effective pitsos
24. Logistics in extension
25. Programme evaluation
26. Marketing
27. Agronomy
28. Soils and conservation
29. Range science
30. Animal diseases

b. Key to responses

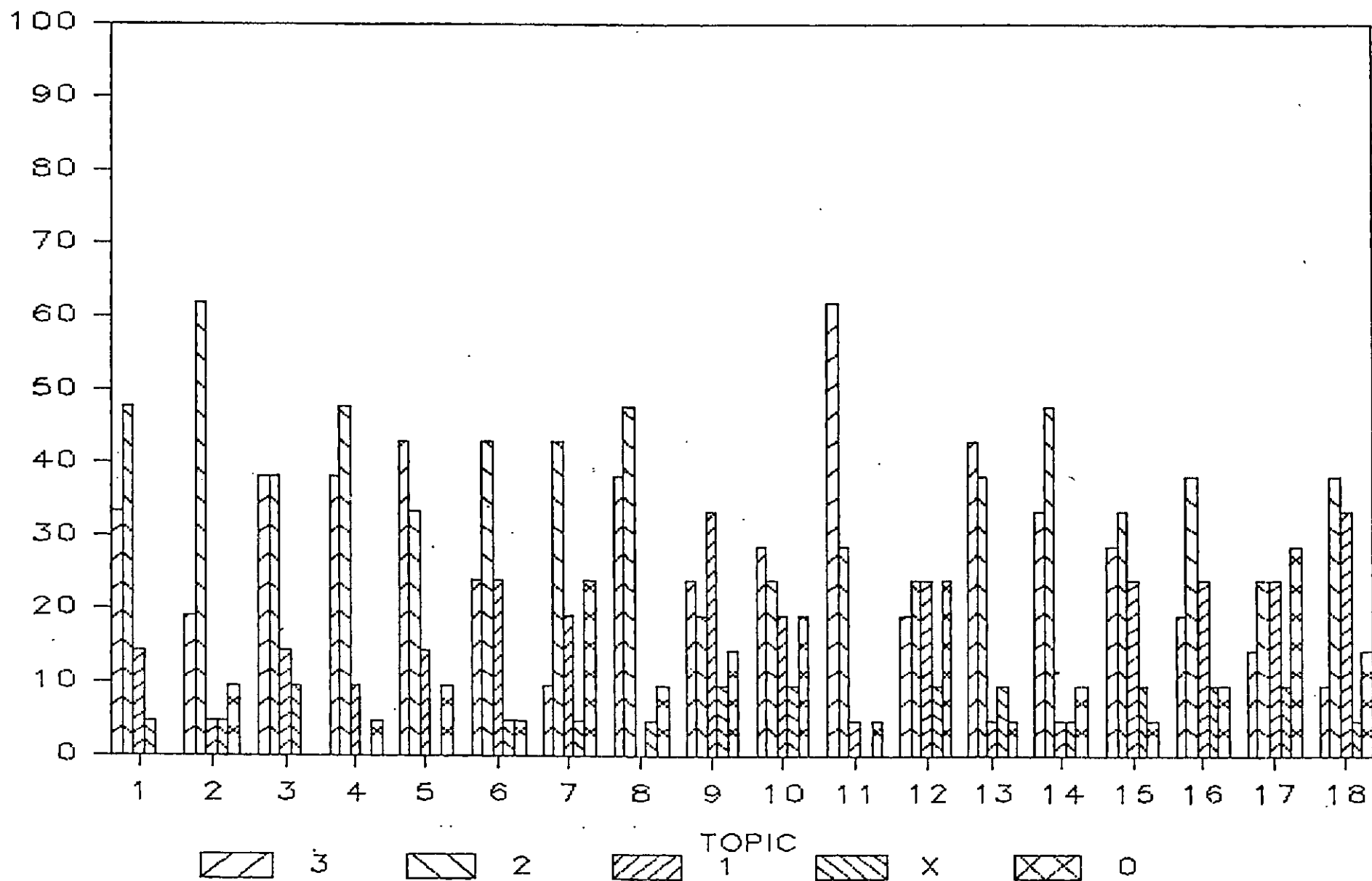
- | | |
|---------------------------|-----|
| - to a great extent | (3) |
| - to a fair extent | (2) |
| - to a slight extent | (1) |
| - don't know/don't recall | (X) |
| - not at all | (0) |

c. KASA change

The KASA data configuration for all responses to all subject matters in raw scores are seen in Table 7.5. The same data in percentages with ordered subject matter are seen in Table 7.6. Finally, the data in percentages with agricultural topics and extension topics coded and segregated are seen in Table 7.7.

There was considerable variability in KASA change responses to agricultural subject matter, with reports of "fair" levels of change being frequent. The highest percentage of "3" scores were recorded for farm machinery, farming systems research, range science and marketing. The bulk of the "2" scores were related to animal science, horticulture, agronomy, plant protection and animal diseases. Consistent "1" scores were registered for agronomy, farm machinery, forestry, plant protection, soils and conservation and range science. There was slight "X" (no recall) scoring in all subject matters. The highest levels of negligible KASA change in agricultural subject matters were seen in farm machinery, forestry, soils, range and animal diseases. Those levels, however, were low in comparison to positive change reported in the same fields.

FIGURE 7.7: PRACTICE CHANGE FOR PARTICIPANTS IN THE MAZENOD EXTENSION EDUCATION COURSE, LESOTHO, 1985



KASA change scores for extension subject matter were also variable with "fair" responses again being quite frequent. Topics such as motivation, communication skills, effective pitso, demonstrations and field trips, and programme evaluation seemed to account consistently for high marks, while topics such philosophy of extension and agricultural careers scored many "2" or fair responses. Variability is such that a rather normal array of KASA change levels can be deduced. No recall seemed to be a modest but persistent problem with instruction in extension management and logistics in extension.

d. Practice change*

The data on practice change for the Airport Hotel Course are likewise seen on Tables 7.5, 7.6 and 7.7.

* It is to be remembered that practice change is also influenced by economic and environmental factors. Traditional African values are also important.

TABLE 7.5: TOTAL KASA AND PRACTICE CHANGE RESPONSES FOR ALL TOPICS BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, LESOTHO, 1985.

	TOPIC		KNOWLEDGE		ATTITUDE		SKILLS		ASPIRATIONS		PRAC. CHANGE										
	NUMBERS	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0					
E	1	30	50	10	10	0	35	55	0	16	0	0	65	20	15	0	20	45	25	5	5
A	2	25	35	25	5	10	30	40	20	0	10	10	55	15	10	10	10	45	30	5	10
E	3	35	65	0	0	0	55	35	10	0	0	40	45	15	0	0	65	10	0	0	0
E	4	35	35	10	20	0	30	50	0	15	5	20	45	15	20	0	25	55	0	15	5
E	5	15	30	45	10	0	20	25	45	10	0	10	25	55	10	0	15	20	30	15	10
E	6	50	30	15	0	5	50	30	20	0	0	30	50	20	0	0	45	25	25	0	5
E	7	65	10	25	0	0	55	25	20	0	0	35	25	35	5	0	40	40	25	0	0
E	8	35	20	25	5	15	40	15	25	5	15	35	15	25	5	20	40	25	20	5	25
E	9	40	35	25	0	0	55	25	15	5	0	45	35	15	5	0	35	15	20	5	0
E	10	25	45	10	15	5	25	35	20	15	5	20	35	20	15	10	30	25	30	10	10
A	11	45	10	25	0	20	35	25	20	0	20	30	30	25	0	15	25	20	25	0	30
A	12	20	20	30	10	0	30	10	30	10	20	25	15	30	10	20	25	20	10	30	30
A	13	25	40	30	0	5	30	50	15	0	5	25	15	30	0	10	25	25	25	5	20
A	14	15	55	15	0	15	40	30	20	0	10	15	40	25	0	10	10	35	20	5	30
A	15	35	50	10	0	5	30	55	10	0	5	35	40	20	0	5	35	35	20	0	10
E	16	40	35	15	10	0	40	20	25	15	0	25	30	30	15	0	20	40	10	20	10
E	17	35	35	10	15	5	55	30	5	5	5	30	40	10	15	5	30	35	15	15	5
E	18	70	25	5	0	0	60	35	5	0	0	40	45	15	0	0	45	10	0	0	0
E	19	45	35	15	5	0	45	50	0	5	0	30	45	15	5	5	30	40	15	10	5
E	20	50	25	15	10	0	40	30	20	10	0	35	30	25	10	0	50	15	35	5	5
E	21	50	30	15	0	5	65	20	15	0	0	45	30	15	0	10	25	25	10	5	10
E	22	25	35	20	15	5	20	30	25	15	10	20	35	15	15	0	40	35	15	0	10
E	23	65	20	10	5	0	50	25	15	0	10	45	35	15	5	5	25	20	30	10	15
E	24	25	40	15	20	0	25	30	15	20	0	20	40	15	20	0	40	15	15	0	10
E	25	55	35	10	0	0	45	45	5	0	5	40	50	10	0	0	55	35	10	0	0
A	26	35	25	15	15	10	25	30	10	20	15	20	20	30	20	10	15	20	20	20	25
A	27	30	30	15	10	15	25	40	10	5	20	20	40	20	5	25	30	20	30	5	25
A	28	30	25	25	5	15	25	30	20	10	20	20	40	20	10	20	10	20	30	10	30
A	29	40	10	25	10	15	40	15	25	10	15	10	40	20	15	20	30	20	20	5	25
A	30	30	30	15	5	20	35	20	10	15	20	30	15	30	15	20	40	15	20	10	35

TABLE 7.6: TOTAL KASA AND PRACTICE CHANGE RESPONSES IN PERCENTAGES BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, TOPICS IN ORDER OF PRESENTATION, LESOTHO, 1985.

	TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
	NUMBERS	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
E	1	6	10	2	2	0	7	11	0	2	0	0	13	4	3	0	4	12	1	3	0	4	9	5	1	1
A	2	5	7	5	1	2	6	8	4	0	2	2	11	3	2	2	3	12	3	0	2	2	9	6	1	2
E	3	7	13	0	0	0	11	7	2	0	0	8	9	3	0	0	5	13	2	0	0	7	8	5	0	0
E	4	7	7	2	4	0	6	10	0	3	1	4	9	3	4	0	5	11	0	3	1	2	10	4	3	1
E	5	3	6	9	2	0	4	5	9	2	0	2	5	11	2	0	3	4	10	2	1	2	6	7	3	2
E	6	10	6	3	0	1	10	6	4	0	0	6	10	4	0	0	6	10	4	0	0	9	5	5	0	1
E	7	13	2	5	0	0	11	5	4	0	0	7	5	7	1	0	9	8	3	0	0	7	8	5	0	0
E	8	7	4	5	1	3	8	3	5	1	3	7	3	5	1	4	8	5	4	1	2	7	3	4	1	5
E	9	8	7	5	0	0	11	5	3	1	0	9	7	3	1	0	7	8	4	1	0	10	4	5	1	0
E	10	5	9	2	3	1	5	7	4	3	1	4	7	4	3	2	6	5	4	3	2	1	7	6	4	2
A	11	9	2	5	0	4	7	5	4	0	4	6	6	5	0	3	6	6	4	0	4	5	4	5	0	6
A	12	4	4	6	2	4	6	2	6	2	4	5	3	6	2	4	5	4	4	2	5	5	3	4	2	6
A	13	5	8	6	0	1	6	10	3	0	1	5	6	6	0	3	5	9	4	0	2	5	5	5	1	4
A	14	3	11	3	0	3	8	6	4	0	2	3	8	5	0	4	6	7	5	0	2	2	7	4	1	6
A	15	7	10	2	0	1	6	11	2	0	1	7	8	4	0	1	7	9	3	0	1	7	7	4	0	2
E	16	8	7	3	2	0	8	4	5	3	0	5	6	6	3	0	6	6	4	4	0	4	8	2	4	2
E	17	7	7	2	3	1	11	6	1	1	1	6	8	2	3	1	6	10	2	1	1	6	7	3	3	1
E	18	14	5	1	0	0	12	7	1	0	0	8	9	3	0	0	9	9	2	0	0	10	7	3	0	0
A	19	9	7	3	1	0	9	10	0	1	0	6	9	3	1	1	6	8	4	1	1	6	8	3	2	1
E	20	10	5	3	2	0	8	6	4	2	0	7	6	5	2	0	10	3	5	2	0	9	2	7	1	1
E	21	10	6	3	0	1	13	4	3	0	0	9	6	3	0	2	10	5	2	0	1	8	7	3	0	2
E	22	5	7	4	3	1	4	6	5	3	2	4	7	4	3	2	4	5	7	3	1	5	4	6	2	3
E	23	13	4	2	1	0	10	5	3	0	2	9	7	3	1	0	8	8	3	0	1	8	7	3	0	2
E	24	5	8	3	4	0	5	6	3	4	2	4	8	3	4	1	5	7	3	4	1	4	8	3	3	2
E	25	11	7	2	0	0	9	9	1	0	1	8	10	2	0	0	11	7	2	0	0	6	9	4	0	0
A	26	7	5	3	3	2	5	6	2	4	0	4	4	6	4	2	5	1	7	4	3	3	4	5	4	5
A	27	6	6	3	2	3	5	8	2	1	4	4	6	4	1	5	5	6	3	1	5	4	4	6	1	5
A	28	6	5	5	1	3	5	6	4	2	3	2	8	4	2	4	3	7	4	2	4	2	4	6	2	6
A	29	8	2	5	2	3	8	3	5	1	3	6	3	6	1	4	6	5	5	1	3	3	7	4	1	5
A	30	6	6	3	1	4	7	4	2	1	3	4	6	3	3	4	4	8	3	1	4	3	5	3	2	7

TABLE 7.7: TOTAL KASA AND PRACTICE CHANGE RESPONSES IN PERCENTAGES BY PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION COURSE, TOPICS SEGREGATED INTO AGRICULTURE AND EXTENSION, LESOTHO, 1985.

	TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
	NUMBERS	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
A	26	7	5	3	3	2	5	6	2	4	3	4	4	6	4	2	5	1	7	4	3	3	4	5	4	5
A	19	9	7	3	1	0	9	10	0	1	0	6	9	3	1	1	6	8	4	1	1	6	8	3	2	1
A	2	5	7	5	1	2	6	8	4	0	2	2	11	3	2	2	3	12	3	0	2	2	9	6	1	2
A	15	7	10	2	0	1	6	11	2	0	1	7	8	4	0	1	7	9	3	0	1	7	7	4	0	2
A	29	8	2	5	2	3	8	3	5	1	3	6	3	6	1	4	6	5	5	1	3	3	7	4	1	5
A	14	3	11	3	0	3	8	6	4	0	2	3	8	5	0	4	6	7	5	0	2	2	7	4	1	6
A	27	6	6	3	2	3	5	8	2	1	4	4	6	4	1	5	5	6	3	1	5	4	4	6	1	5
A	11	9	2	5	0	4	7	5	4	0	4	6	6	5	0	3	6	6	4	0	4	5	4	5	0	6
A	30	6	6	3	1	4	7	4	2	1	3	4	6	3	3	4	4	8	3	1	4	3	5	3	2	7
A	13	5	8	6	0	1	6	10	3	0	1	5	6	6	0	3	5	9	4	0	2	5	5	5	1	4
A	28	6	5	5	1	3	5	6	4	2	3	2	8	4	2	4	3	7	4	2	4	2	4	6	2	6
A	12	4	4	6	2	4	6	2	6	2	4	5	3	6	2	4	5	4	4	2	5	5	3	4	2	6
E	16	8	7	3	2	0	8	4	5	3	0	5	6	6	3	0	6	6	4	4	0	4	6	2	4	2
E	22	5	7	4	3	1	4	6	5	3	2	4	7	4	3	2	4	5	7	3	1	5	4	6	2	3
E	23	13	4	2	1	0	10	5	3	0	2	9	7	3	1	0	8	8	3	0	1	8	7	3	0	2
E	9	8	7	5	0	0	11	5	3	1	0	9	7	3	1	0	7	8	4	1	0	10	4	5	1	0
E	24	5	8	3	4	0	5	6	3	4	2	4	8	3	4	1	5	7	3	4	1	4	8	3	3	2
E	17	7	7	2	3	1	11	6	1	1	1	6	8	2	3	1	6	10	2	1	1	6	7	3	3	1
E	25	11	7	2	0	0	9	9	1	0	1	8	10	2	0	0	11	7	2	0	0	6	9	4	0	0
E	8	7	4	5	1	3	8	3	5	1	3	7	3	5	1	4	8	5	4	1	2	7	3	4	1	5
E	7	13	2	5	0	0	11	5	4	0	0	7	5	7	1	0	9	8	3	0	0	7	8	5	0	0
E	21	10	6	3	0	1	13	4	3	0	0	9	6	3	0	2	10	5	2	0	1	8	7	3	0	2
E	6	10	6	3	0	1	10	6	4	0	0	6	10	4	0	0	6	10	4	0	0	9	5	5	0	1
E	1	6	10	2	2	0	7	11	0	2	0	6	13	4	3	0	4	12	1	3	0	4	9	5	1	1
E	5	3	6	9	2	0	4	5	9	2	0	2	5	11	2	0	3	4	10	2	1	2	6	7	3	2
E	20	10	5	3	2	0	8	6	4	2	0	7	6	5	2	0	10	3	5	2	0	9	2	7	1	1
E	18	14	5	1	0	0	12	7	1	0	0	8	9	3	0	0	9	9	2	0	0	10	7	3	0	0
E	10	5	9	2	3	1	5	7	4	3	1	4	7	4	3	2	6	5	4	3	2	1	7	6	4	2
E	4	7	7	2	4	0	6	10	0	3	1	4	9	3	4	0	5	11	0	3	1	2	10	4	3	1
E	3	7	13	0	0	0	11	7	2	0	0	8	9	3	0	0	5	13	2	0	0	7	8	5	0	0

There was vast variability in practice change in agriculture ensuing from the Airport Hotel extension education course. The highest level of "great" practice change was in horticulture. This was overshadowed by reports of "fair" practice change accruing to agronomy, animal science, horticulture, farming systems research, and range science. Significant "slight" levels of practice change were seen in agronomy, farm machinery, plant protection, marketing, and soils and conservation. The highest levels of no recall were found in marketing and range science, and rather high levels of negligible practice change were seen in animal diseases, soils and conservation, range science, and marketing.

With respect to practice change in extension topics there again was considerable variability in responses though "3" and "2" scores seemed to prevail in most subjects taught. Practice change to a great extent, was the trend in such areas as writing extension objectives, training and visit system, village agricultural committees, communication skills, needs assessment, demonstrations and field trips, and effective pitso. Practice change to a fair extent, was seen subsequent to instruction in philosophy of extension, effective listening, extension management, motivation skills, interrelationships in agriculture, programme

development cycle, agricultural careers, logistics in extension, and programme evaluation. Slight practice change was 'frequent' for cultural implications, interrelationship in agriculture, needs assessment, and lay leadership. Modest no recall was seen for interrelationships in agriculture and programme development cycle, while no practice change was only significant in the training and visit system.

The above data may be seen graphically in Appendices B.10 - B.19.

7.6.7 KASA and practice change for Research Division course

Keys for the interpretation of data in Table 7.8 and Figures 7.8 - 7.12 follow:

a. Key to subject matter

1. Agronomy
2. Potato production
3. Soil/Conservation
4. Weed control
5. Farm management
6. Extension methods
7. Horticulture

8. Farm machinery
9. Soil sampling
10. Fodder production
11. Marketing
12. Communications

b. Key to responses

- to a great extent (3)
- to a fair extent (2)
- to a slight extent (1)
- don't know/don't recall (X)
- not at all (0)

c. KASA change

KASA changes reported by plant and soil science subject matter specialists subsequent to instruction in mainly agricultural subjects, were positive with "3" scores predominating in such subjects as potato production, weed control, extension methods, horticulture, farm machinery, soil sampling techniques, marketing and communications. Fair KASA change "2" scores prevailed in agronomy and farm management. Slight change "1" scores dominated only in soil conservation, while the only significant no recall was in farm management. Very

slight negligible KASA change was seen for fodder production. These data are seen on Table 7.8 and Figures 7.8 - 7.11.

d. Practice change

Practice change related to the same course was likewise quite positive. Between 40% and 60% of the respondents reported a great extent of practice change in agronomy, potato production, weed control, extension methods, horticulture, and communications. Fair practice change was reported by 50% in extension methods. Slight practice change was significant only in soil conservation, while the largest no recall score was in farm management (27%). Negligible practice change predominated for soil sampling techniques and was also significant in weed control and soil conservation. The configuration of this data is seen in Figure 7.12.

7.6.8 KASA and practice change for District-Based Course

The data contained in Table 7.9 and Figures 7.13 - 7.17 can be interpreted through use of the following keys.

a. Key for subject matter

1. Relation of research to extension
2. Needs assessment
3. Group formation and dynamics
4. Communication skills
5. Extension teaching methods
6. Visual aids

b. Key to responses

- to a great extent (3)
- to a fair extent (2)
- to a slight extent (1)
- don't know/don't recall (X)
- not at all (0)

c. KASA change

KASA change reported by these district-based extension workers and subject matter specialists in relation to the instruction in extension methods given in all ten districts of Lesotho was notable. The data can be seen in Table 7.9 and Figures 7.13 - 7.16. Scores of "3" indicating KASA

TABLE 7.8: KASA AND PRACTICE CHANGE RAW SCORES FOR PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985.

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	7	8	2	0	1	11	6	0	0	1	5	6	4	0	3	9	6	2	0	1	10	3	3	0	2
2	11	4	3	0	0	13	4	1	0	0	9	6	2	1	0	12	6	0	0	0	11	3	3	0	1
3	4	4	6	3	1	7	4	4	3	0	3	5	5	3	2	6	5	5	2	0	3	5	4	2	4
4	12	3	2	1	0	17	1	0	0	0	10	6	1	1	0	13	3	1	1	0	8	3	1	1	5
5	4	6	2	5	1	5	5	2	5	1	3	7	2	5	1	5	7	1	4	1	4	4	3	5	2
6	11	7	0	0	0	11	6	0	0	1	11	7	0	0	0	10	6	1	0	1	8	9	1	0	0
7	14	3	1	0	0	13	4	0	0	1	13	2	2	1	0	13	5	0	0	0	10	5	2	0	1
8	9	3	5	1	0	8	6	3	1	0	8	3	5	1	1	9	4	3	1	1	8	3	4	1	2
9	10	5	2	1	0	11	5	1	1	0	7	5	4	1	1	11	4	2	1	0	5	3	0	1	9
10	5	3	5	3	2	7	6	1	3	1	5	6	1	3	3	6	5	3	3	1	6	4	2	3	3
11	7	4	4	3	0	8	3	4	3	0	6	5	4	3	0	5	5	5	3	0	4	5	3	3	3
12	13	5	0	0	0	13	5	0	0	0	11	4	3	0	0	11	4	2	0	1	10	5	3	0	0

KASA AND PRACTICE CHANGE IN PERCENTAGES FOR PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985.

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	39	44	11	0	6	61	33	0	0	6	28	33	22	0	17	50	33	11	0	6	56	17	17	0	11
2	61	22	17	0	0	72	22	6	0	0	50	33	11	6	0	67	33	0	0	0	61	17	17	0	6
3	22	22	33	17	6	39	22	22	17	0	17	28	28	17	11	33	28	28	11	0	17	28	22	11	22
4	67	17	11	6	0	94	6	0	0	0	56	33	6	6	0	72	17	6	6	0	44	17	6	6	28
5	22	33	11	28	6	28	28	11	28	6	17	39	11	28	6	28	39	6	22	6	22	22	17	28	11
6	61	39	0	0	0	61	33	0	0	6	61	39	0	0	0	56	33	6	0	6	44	50	6	0	0
7	78	17	6	0	0	72	22	0	0	6	72	11	11	6	0	72	28	0	0	0	56	28	11	0	6
8	50	17	28	6	0	44	33	17	6	0	44	17	28	6	6	50	22	17	6	6	44	17	22	6	11
9	56	28	11	6	0	61	28	6	6	0	39	28	22	6	6	61	22	11	6	0	28	17	0	6	50
10	28	17	28	17	11	39	33	6	17	6	28	33	6	17	17	33	28	17	17	6	33	22	11	17	17
11	39	22	22	17	0	44	17	22	17	0	33	28	22	17	0	28	28	28	17	0	22	28	17	17	17
12	72	28	0	0	0	72	28	0	0	0	61	22	17	0	0	61	22	11	0	6	56	28	17	0	0

FIGURE 7.8: KNOWLEDGE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION
EDUCATION COURSE, LESOTHO, 1985

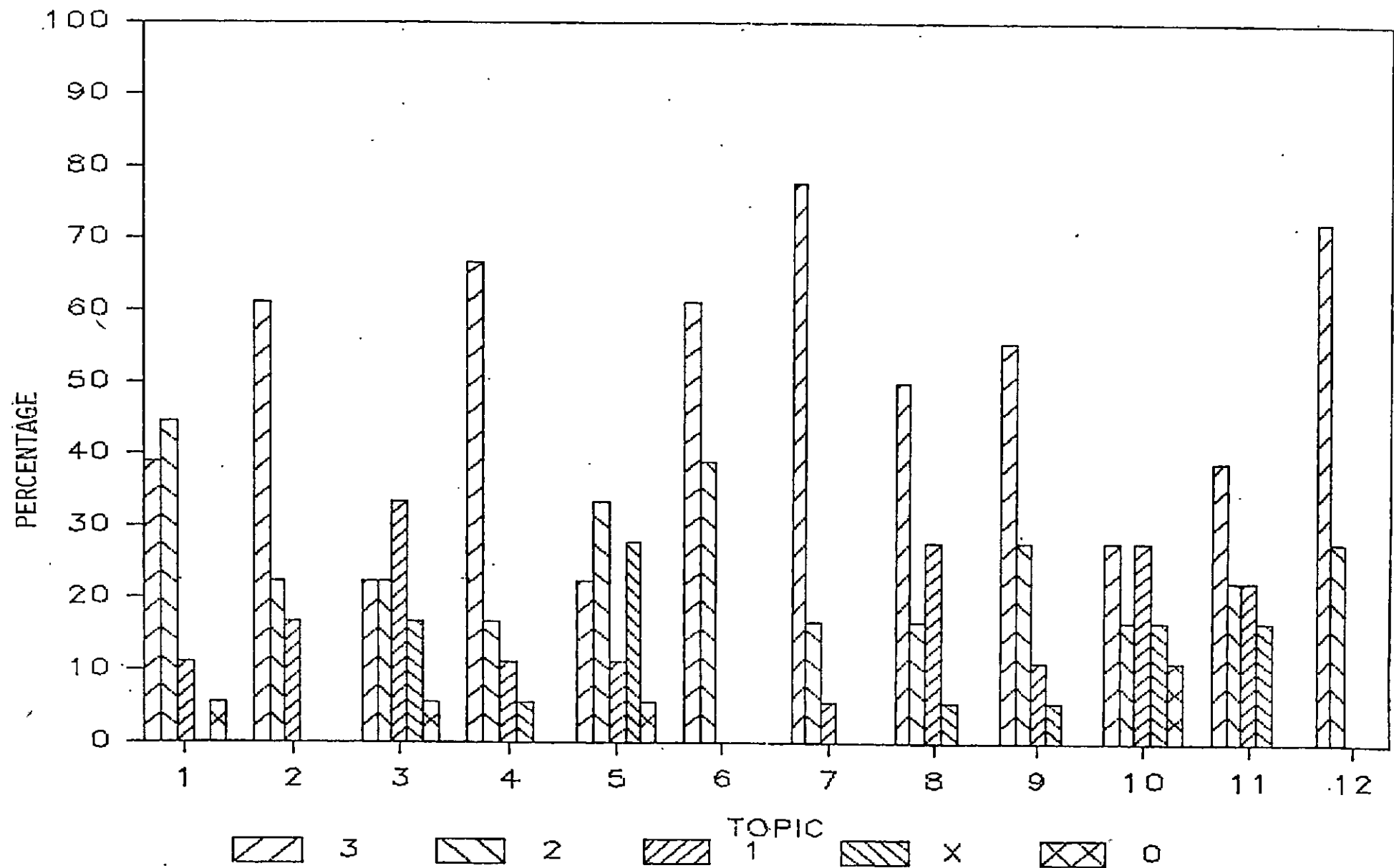


FIGURE 7.9: ATTITUDE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

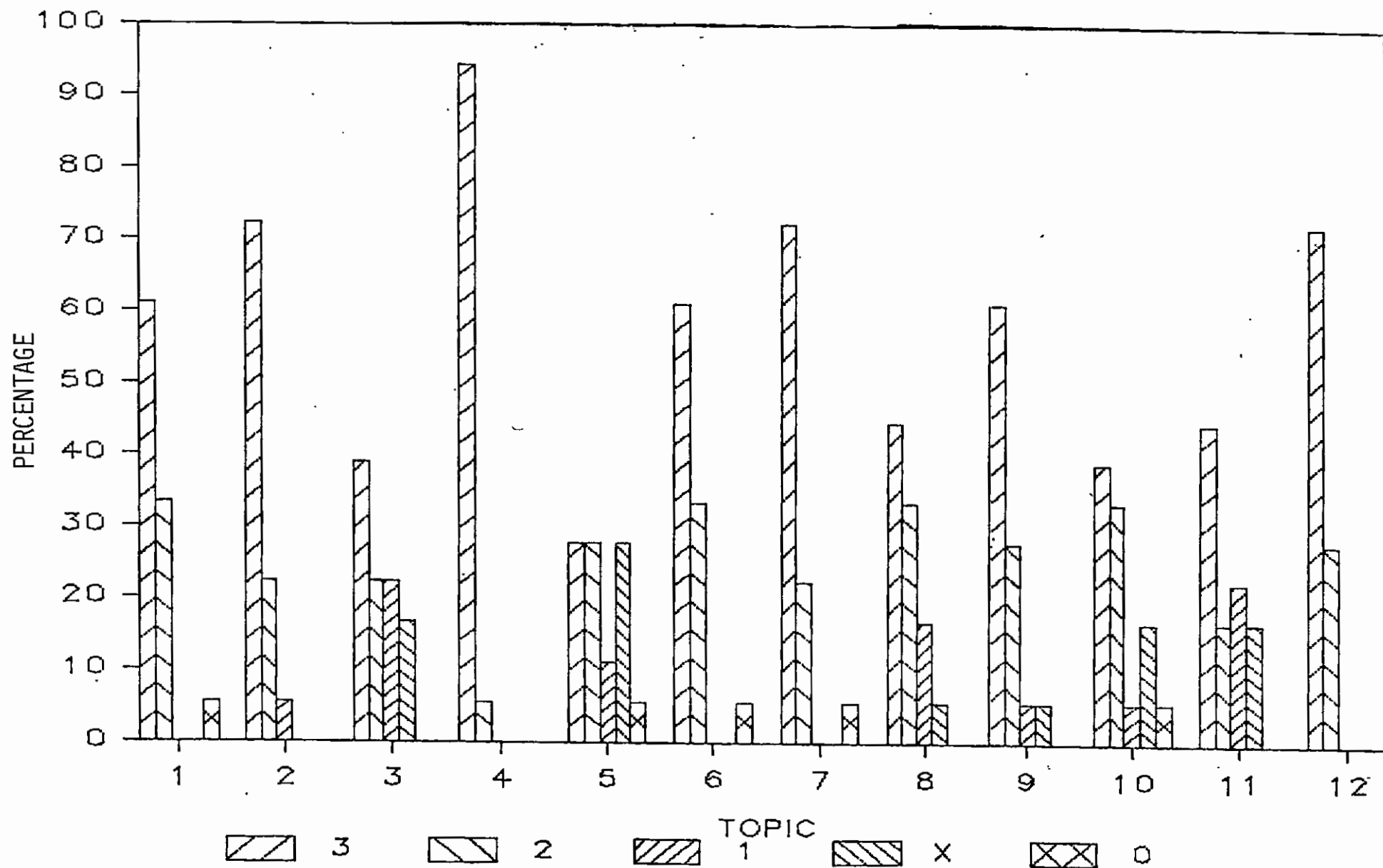


FIGURE 7.10. SKILLS CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

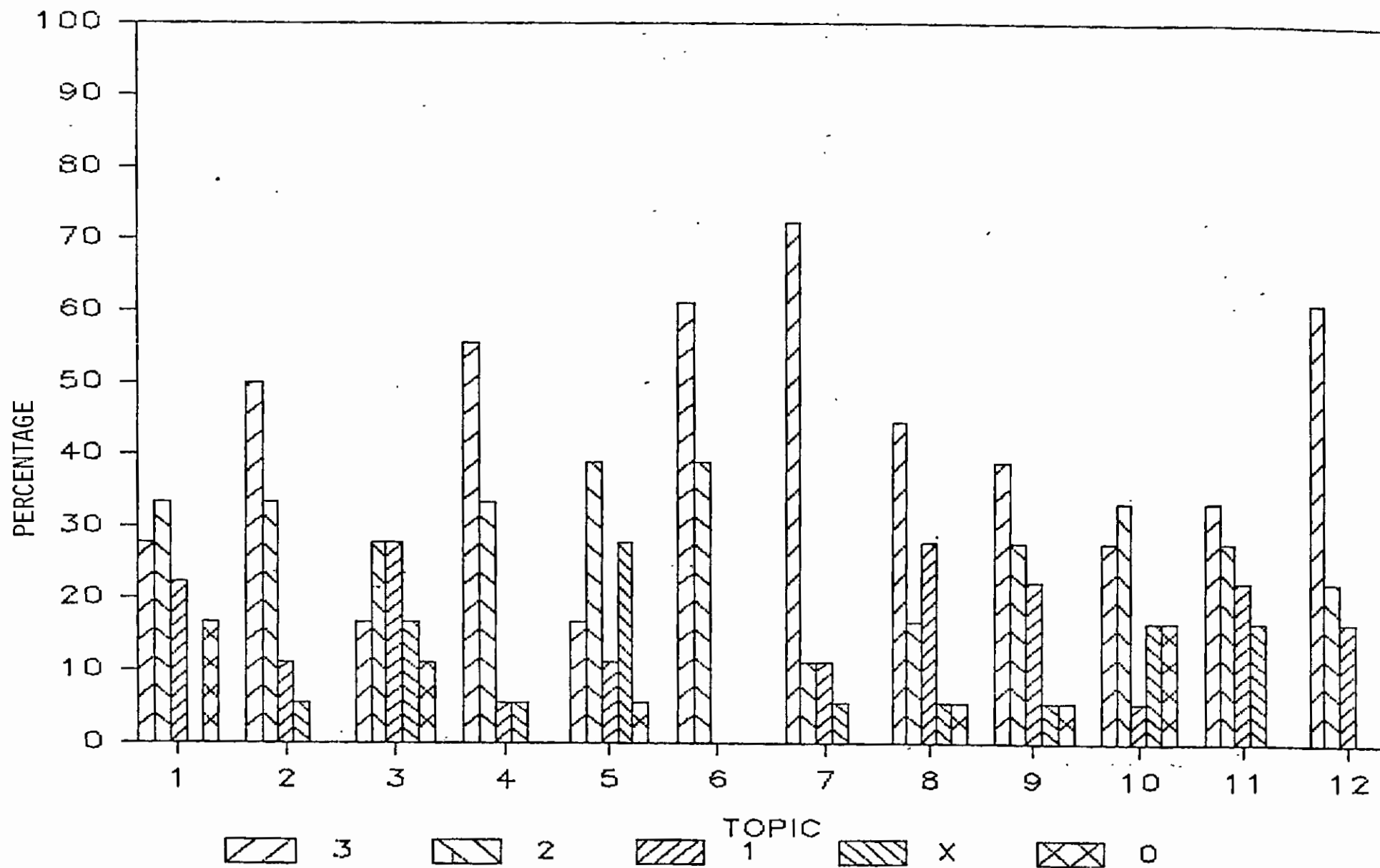


FIGURE 7.11: ASPIRATIONS CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

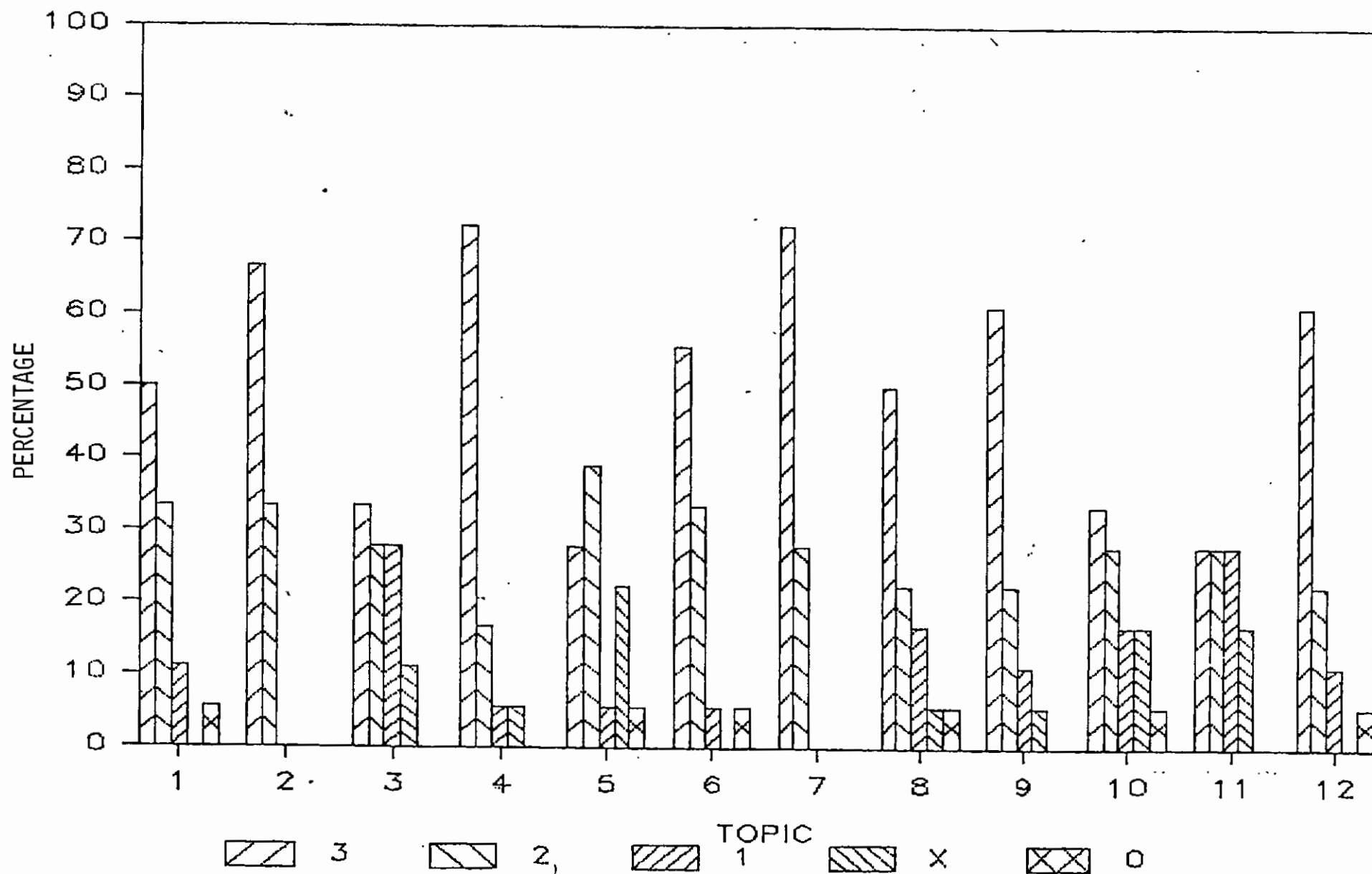


FIGURE 7.12: PRACTICE CHANGE AMONG PARTICIPANTS IN THE RESEARCH DIVISION EXTENSION EDUCATION COURSE, LESOTHO, 1985

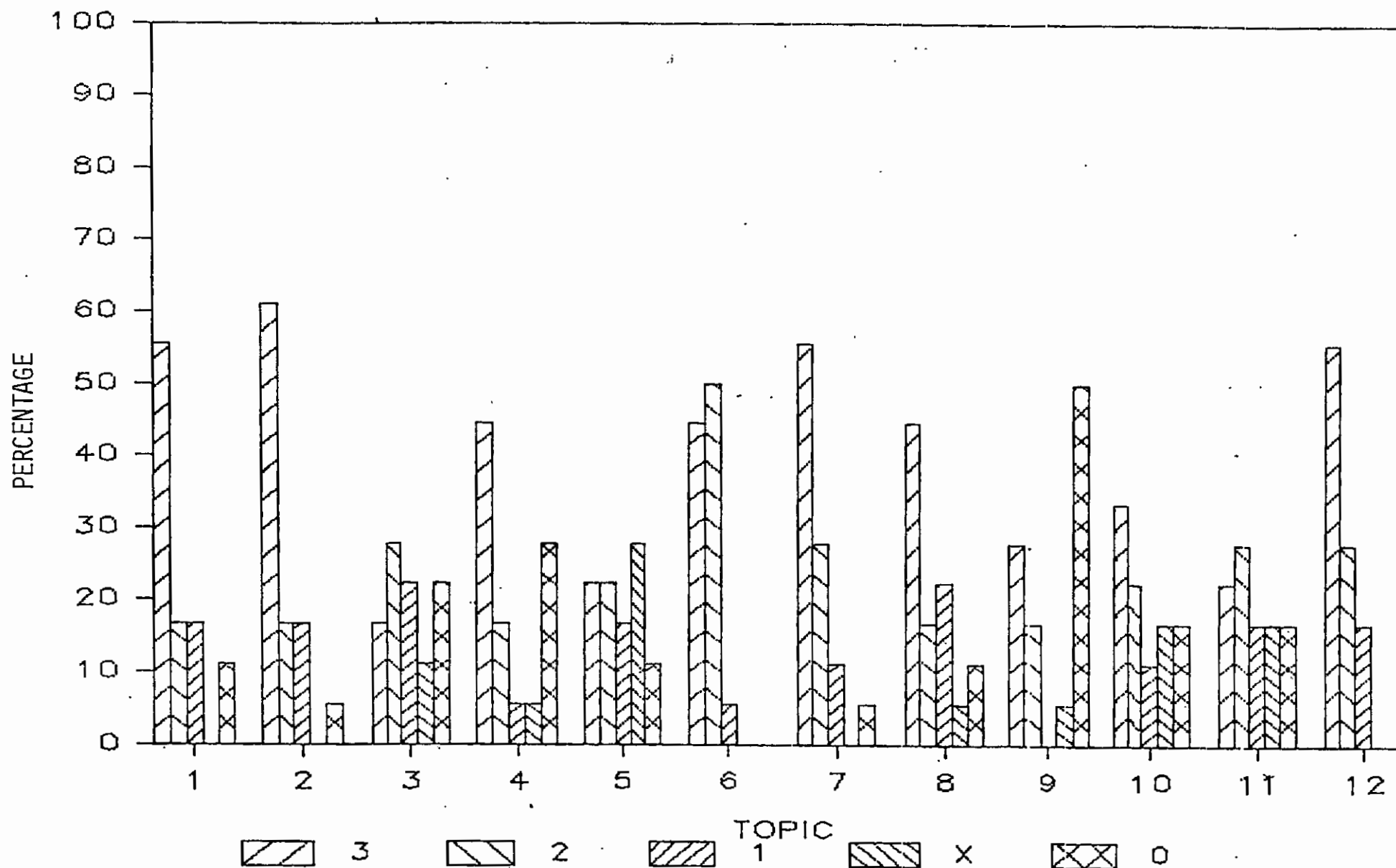


TABLE 7.9: KASA AND PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE IN RAW SCORES, LESOTHO, 1985.

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	18	18	6	5	0	22	16	4	5	0	17	15	10	5	0	17	11	12	6	1	7	18	9	4	9
2	18	15	7	7	0	21	15	3	7	1	18	18	3	7	1	21	12	6	7	1	10	19	11	3	4
3	22	15	6	4	0	27	13	2	5	0	18	17	5	5	2	21	19	1	5	1	11	22	7	3	4
4	30	12	3	1	1	30	10	6	1	0	23	18	5	1	0	23	16	7	1	0	20	14	9	0	4
5	26	7	9	5	0	27	7	7	3	3	16	15	10	3	3	22	8	10	3	4	10	13	8	1	15
6	27	17	1	2	0	28	16	1	2	0	23	15	7	2	0	21	14	10	2	0	18	13	12	1	3

KASA AND PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE IN PERCENTAGES, LESOTHO, 1985.

TOPIC	KNOWLEDGE					ATTITUDE					SKILLS					ASPIRATIONS					PRAC. CHANGE				
NUMBER	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0	3	2	1	X	0
1	38	38	13	11	0	47	34	9	11	0	36	32	21	11	0	36	23	26	13	2	15	38	19	9	19
2	38	32	15	15	0	45	32	6	15	2	38	38	6	15	2	45	26	13	15	2	21	40	23	6	9
3	47	32	13	9	0	57	28	4	11	0	38	36	11	11	4	45	40	2	11	2	23	47	15	6	9
4	64	26	6	2	2	64	21	13	2	0	49	38	11	2	0	49	34	15	2	0	43	30	19	0	9
5	55	15	19	11	0	57	15	15	6	6	34	32	21	6	6	47	17	21	6	9	21	28	17	2	32
6	57	36	2	4	0	60	34	2	4	0	49	32	15	4	0	45	30	21	4	0	38	28	26	2	6

FIGURE 7.13: KNOWLEDGE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985

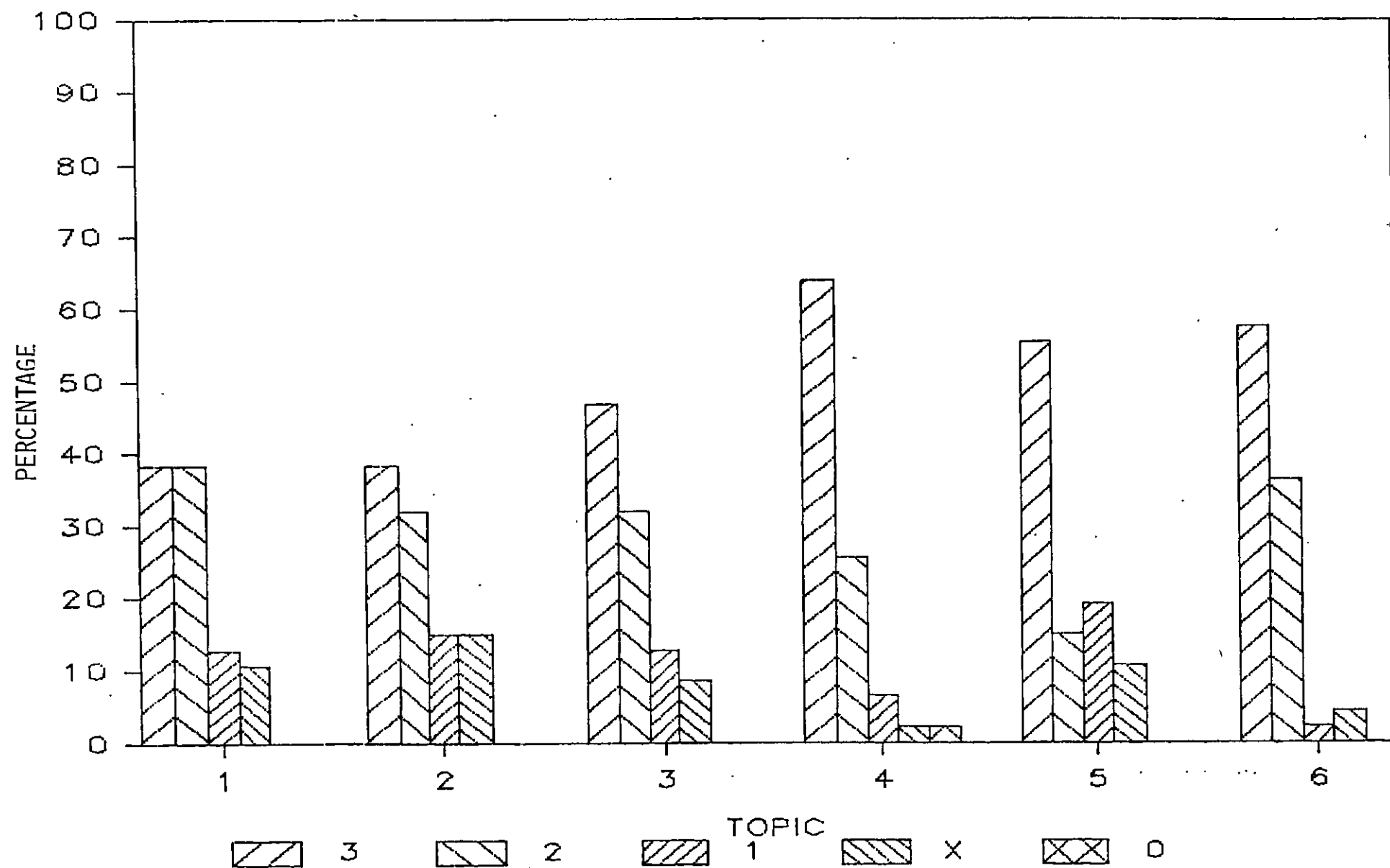


FIGURE 7.14: ATTITUDE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985

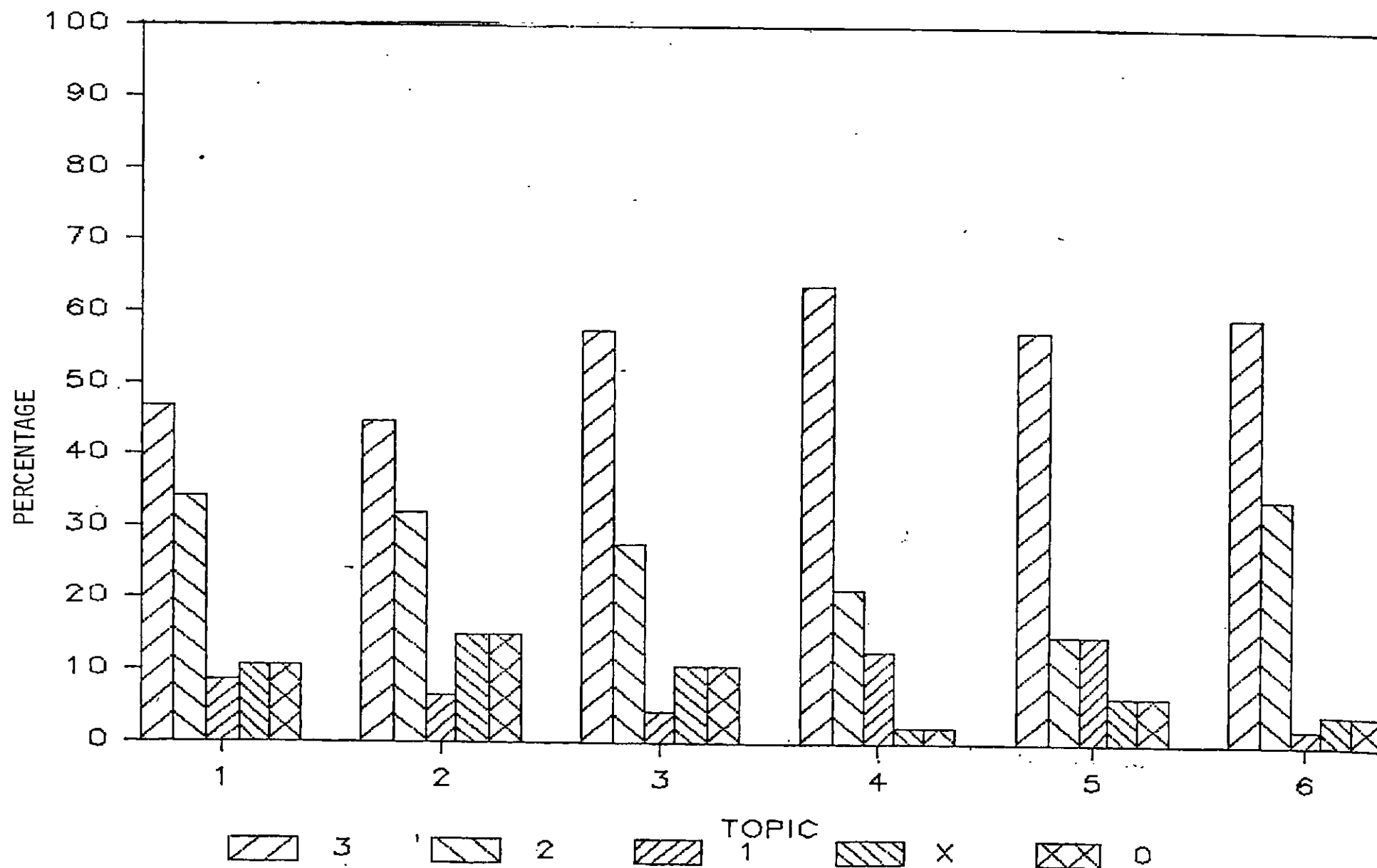


FIGURE 7.15: SKILLS CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985

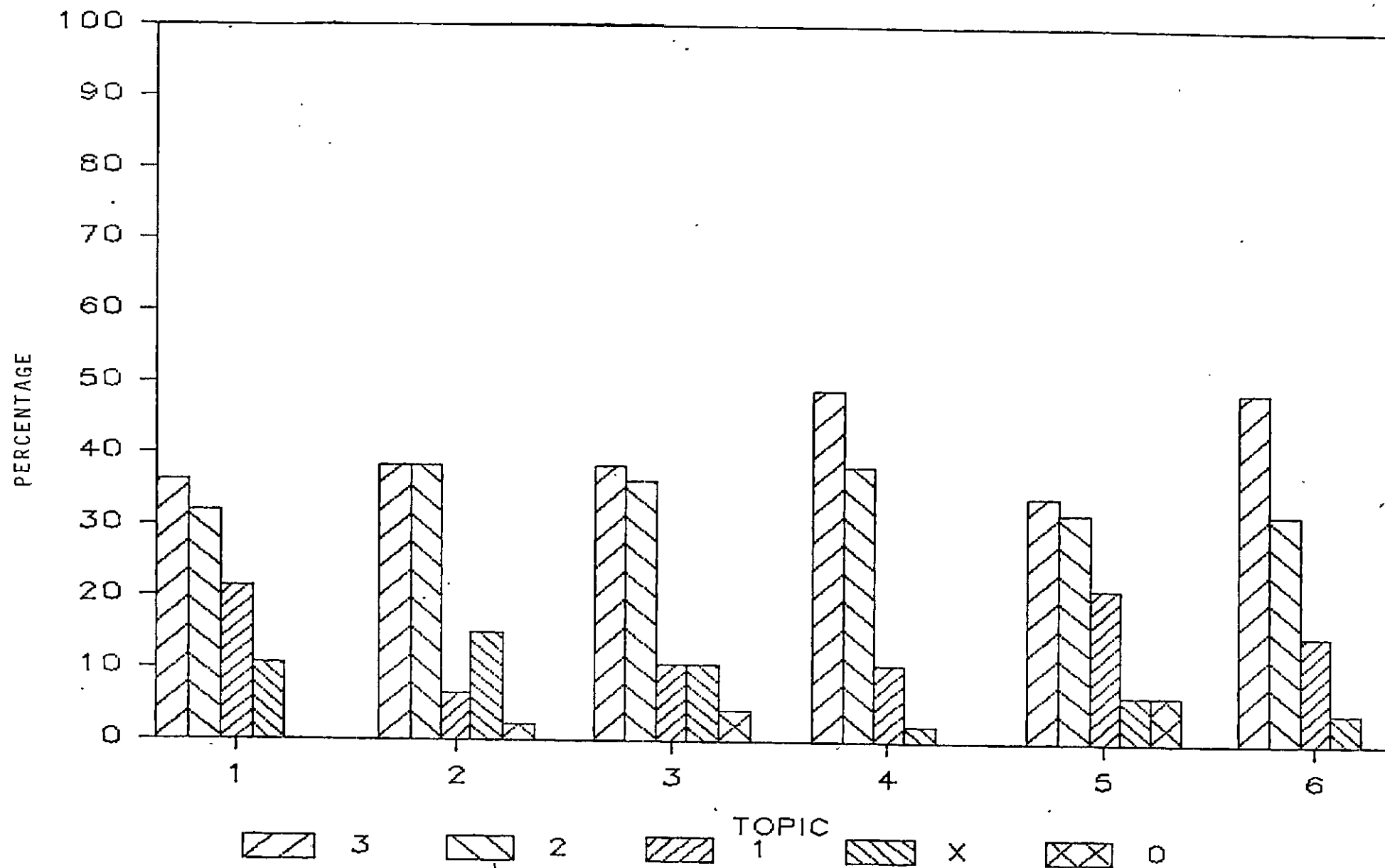
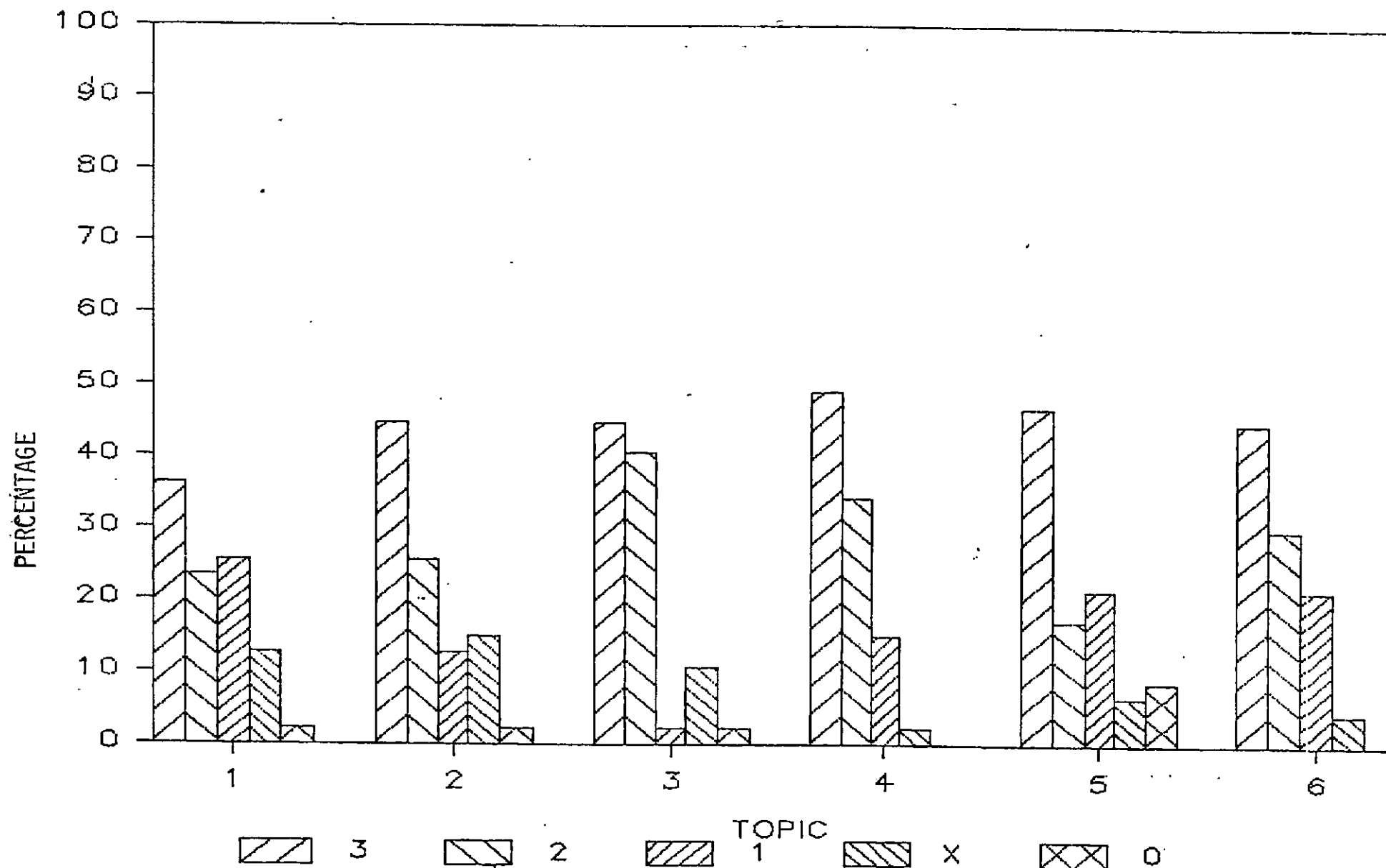


FIGURE 7.16: ASPIRATION CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION
EDUCATION COURSE, LESOTHO, 1985



change to a great extent dominated in all components of KASA and for all subject matters. KASA change to a fair extent, was also significant for all subject matters. Slight KASA change was also seen in relation of research to extension and visual aids in the skills and aspirations components, while no recall was significant only for needs assessment. Negligible KASA change was insignificant.

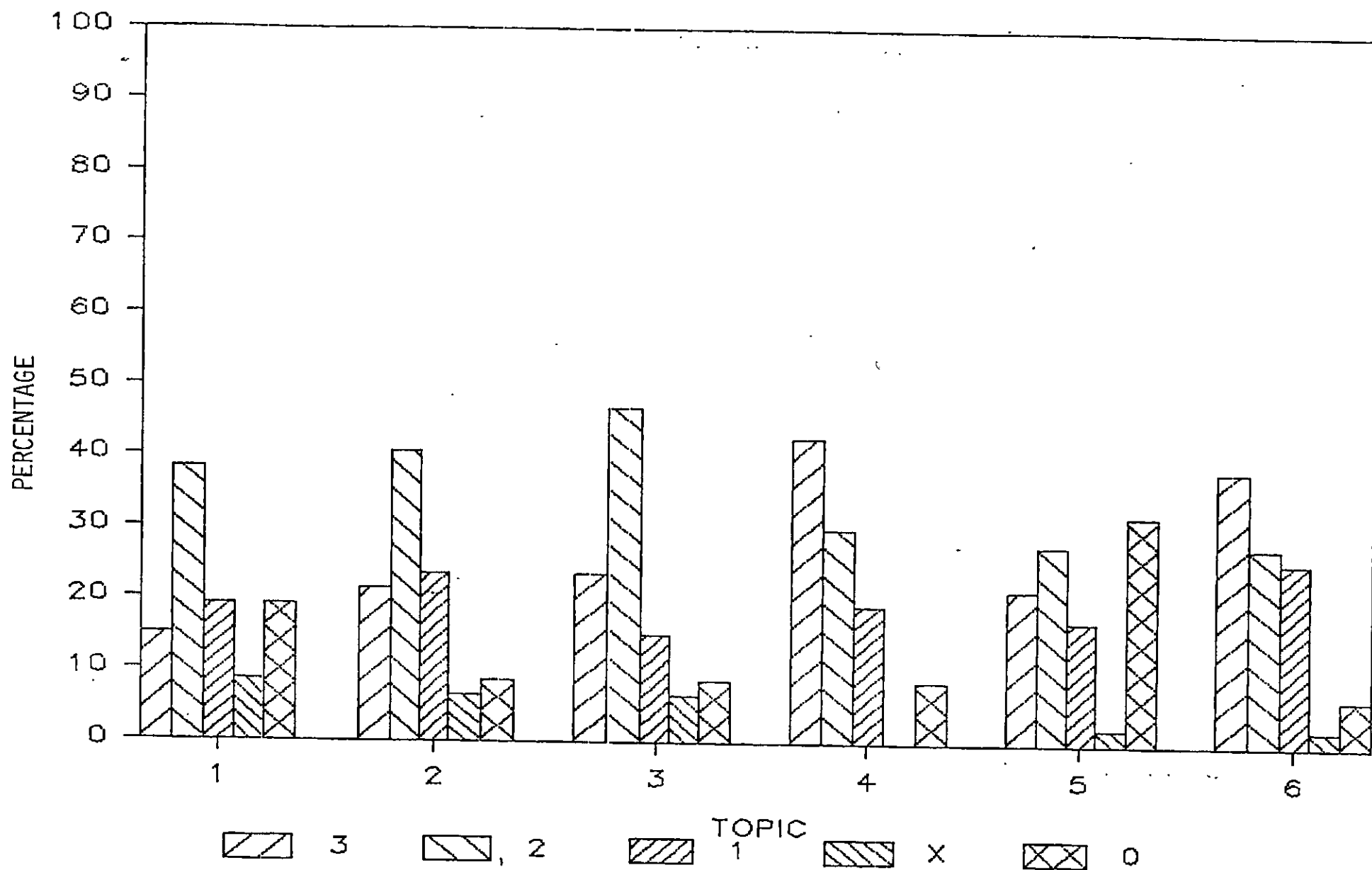
d. Practice change

Practice change reported by this group differed slightly from KASA scores in that fair change tended to predominate in needs assessment, relation of research to extension, group formation and dynamics, and extension teaching methods. Practice change to a great extent, prevailed in communications skills and visual aids, while slight change was significant in needs assessment and visual aids. Negligible practice change was insignificant while a significant no recall response was seen for extension teaching methods.

7.6.9 Examples of practice change

In order to ascertain the nature of reported practice change related to the extension education courses conducted

FIGURE 7.17: PRACTICE CHANGE AMONG PARTICIPANTS IN THE DISTRICT-BASED EXTENSION EDUCATION COURSE, LESOTHO, 1985



for district-based extension workers and subject matter specialists, open end probe questions were asked of respondents permitting them the opportunity to expand on their responses. Examples of practice change thus described follow.^{*}

Respondent DB-4 formed a farmers' association of 35 members in order to purchase inputs on credit and contract for tractors, to which over half contributed financial quotas. Respondent DB-5 surveyed sites and gathered farmer opinion on location of irrigation sites, organized crop production associations, and conducted monthly training for district staff employing improved extension methods. Respondent DB-7 made his own visual aids. Respondent DB-8 organized ox-drawn implement groups, involving 90 farmers, for plowing and planting operations. Respondent DB-15 began to make farm and home visits to her women's groups after attending the course. Respondent DB-17 used posters to demonstrate proper weeding. Respondent DB-26 said his improved communication skills and extension techniques were used in his work with TOU farmers. Respondent DB-29 sent soil samples to the research laboratory, and practiced group techniques among his farmers. Respondent DB-30 used the village agricultural committee method with good results. Respondent DB-33 used charts and posters in nutrition

* Many of these represent important breakthroughs and advances in extension methodology in Lesotho which were not happening prior to FSR/E.

education and measuring tapes for determination of field size. Respondent DB-34 taught animal nutrition to his farmers. Respondent DB-37 organized a Merino association of 17 farmers who have purchased 350 improved ewes and 10 rams and a Brown Swiss association of 35 farmers who intend to work toward improved animal quality. Respondent DB-38 used visual aids in demonstrating functional poultry houses to farmers who are now building their own. Respondent DB-40 taught farmers about the advantages of using cow manure and also demonstrated inter-row cropping using beans and peas with maize. Respondent DB-41 read research circulars which were helpful to his work. Respondent DB-44 said she formed a village agricultural committee, and is using posters in her extension programmes. Respondent DB-46 conducted planting demonstration on cabbage for members of young farmers' clubs, took them on farm walks, and used visual aids to show breed characteristics of swine and dairy cows. Finally, Respondent DB-47 developed charts and posters about food groups and breast-feeding. Respondent RD-2 used cultivars applicable to his region and conducted some market research. Respondent RD-3 did some physical and chemical weed control. Respondent RD-4 made use of the farm machinery mobile unit in her area. Respondent RD-5 planted grass for donga control. Respondent RD-6 implemented an apple tree programme with 95 farmers. Respondent RD-7

conducted short courses on the calibration of ox-drawn machinery. Respondent RD-11 taught farmers how to mulch and encouraged them to plant trees. Respondent RD-13 devised farm management instruction for an illiterate farmer group. Respondent RD-14 encouraged farmers to grow fodder on marginal lands. Respondent RD-15 ordered FAO-funded weeding machinery for farmers.

Respondent M-2 organized pitsos for instruction in sorghum production. Respondent M-7 mounted agricultural campaigns using farmers as deliverers of the campaign messages, he also planted pine and poplar trees. Respondent M-8 tried to improve maize production through on-farm trials. Respondent M-9 taught farmers about hybrid seed. Respondent M-10 planted a woodlot with villagers over a two-week period. Respondent M-11 facilitated market contracts for farmers among both villagers and traders. Respondent M-12 conducted wheat variety trials with four different farmers on the high veld. Respondent M-19 implemented a rotational grazing programme in his area.

Respondent AH-2 was able to recognize animal diseases and relate them to appropriate treatments. Respondent AH-3 conducted programme evaluations. Respondent AH-4 staked tomatoes with maize. Respondent AH-6 promoted supplementary

feeding of livestock. Respondent AH-7 formed wool and mohair growers groups. Respondent AH-14 adopted methods taught about organizing effective pitsos with good results. Respondent AH-15 organized in-service training for subordinates around discussion groups. Respondent AH-17 did research in afforestation in the mountain area. Respondent AH-18 helped extension assistants use short format to plan annual work programme. Respondent AH-19 motivated farmers to improve indigenous cattle.

This review of examples of practice change reflects the substantial array of subject matter contained in the extension education programmes conducted for this clientele, indicates its practical nature and demonstrates the manner in which innovations learned are put into practice by agricultural professionals in the field.

Of course, there are inhibiting factors to practice change in every environment. Many were voiced by the participants which were not unlike those found by Bembridge, Steyn and Williams (1983, pp. 88 - 84) in KwaZulu. Things such as lack of transport and lack of materials for visual aids appeared frequently. Insensitivity of superiors and non-availability of inputs were registered infrequently. No place for planting trees, lack of farmer cooperation and

inadequate marketing infrastructure were also mentioned. However, since there is ample evidence above that many field workers have surmounted these inhibitors and have mounted successful programmes implementing positive practice change, it may be suggested that the concerns identified represent inconveniences and complaints and that they are not real constraints to effective extension education programmes.

7.6.10 Recommendations by participants

In order to elicit maximum feedback from field-based personnel toward making future instruction more effective, all respondents were asked what suggestions they had for the improvement of the Research Division's continuing education programmes.

There were many recommendations stated by individual respondents which, while interesting, represented personal concerns. Others were voiced by small groups with special concerns. However, those representing relatively wide sentiment were nine.

That the extension continuing education courses be held with greater frequency was recommended by 38 persons (36%). That

more practicals become part of the instruction was felt by 29 individuals (27%). Some 24 respondents (23%) called for more follow-up by research personnel after courses. A group of 19 participants (18%) said courses should be longer, most calling for two week-courses as opposed to those given for a single week. Field trips were deemed necessary by 14 respondents (13%). Lecturers must be more knowledgeable and more audio-visual aids should be used in the instruction according to 11 people (10%) for each of those recommendations. Finally, 10 persons (9%) each called for more time per topic and nutrition education as a subject matter to be included.

7.7 SUMMARY

The impacts of farming systems research extension continuing education programmes perceived by field based extension workers and subject matter specialists, were both positive and significant. It seems to have been a valuable decision to take those programmes, earlier restricted to a selected few, to the districts in order to reach more field people and to get closer to field problems.

Instruction in extension education methods seemed to

strengthen the professional versatility of persons earlier trained in technical subject matter, while instruction in agriculture enhanced the knowledge and skills of general extension workers. In both cases, the "up-date" nature of the programmes was most appropriate.

KASA change related to the programmes, while indicative, was seen as positive. Though there was considerable variability in responses, change to a great or fair extent, was most frequently reported. Change to a slight extent, was also seen. No recall and no learning was isolated to infrequent instances of but a very few subject matters.

Practice change responses were likewise variable but positive. Many responses reported fair practice change in a number of subject matters with frequent accounts of change to a great extent, in areas of specialization or particular appropriateness. Again, no practice change and no recall were less frequent and seemed to be related to subject matters not relevant to the respondent's principal assignment or simply of little interest to him/her.

Examples of practice change were encouraging in that they represented living testimony, as it were, to the feasibility of sound extension education events under conditions of

limited resources. Under those circumstances, associated reports of inhibiting factors seemed to articulate complaints rather than constraints. Important recommendations were compiled by participants which tended to support and improve the current trend of extension continuing education programmes.

CHAPTER 8 CONCLUSIONS

Extension education programmes in Lesotho, carried out from 1979 through 1984 in conjunction with a farming systems research development strategy, had tentative but indicative impacts on three key target groups in that country's agriculture. These were farmer contact groups, chiefs, headmen and headwomen, and district-based extension workers and subject matter specialists.

The research which produced this conclusion, separately addressed and provisionally fulfilled the several components of the purpose of this study. The role of nonformal education in meeting the needs of the rural poor was investigated through the works and pronouncements of major scholars in the development education community and was seen to be both central and critical to new and dynamic interdisciplinary approaches to integrated development.

Extension education was studied as that form of nonformal education developed within and specifically for the agricultural environment. Scholarship into the findings of principal extension administrators and practitioners documented the vital and dynamic role of extension

education in the agriculture of the developing world.

A contemporary school of thought has produced a body of literature about farming systems research as an integrative strategy designed to make the farmer a proactive partner in agricultural development. Research into the works of principal proponents of the farming systems research strategy established that there is no stage in which extension education is not ideally involved if desired change is to take place and endure. The active role extension education has played in the Lesotho farming systems research intervention confirms that relationship.

The impact of extension education programmes on members of farmer contact groups in the farming systems research prototype areas in Lesotho became clearer in self perceived changes among members in their knowledge, attitudes, skills and aspirations levels in the subject matter areas taught. Further, indication of positive impact was seen in reported practice change in such areas as agronomy, horticulture, pest control, farm machinery and rural leadership. This trend was shown to be even more promising in terms of the real benefits of farming systems research through extension education as perceived by the same clientele. Prominent



among those benefits were such developments as better meals for farm families, higher yields, more income from farming and the ability to acquire better farm inputs.

The effectiveness of farmer contact groups as an innovations diffusion network and as disseminators of agricultural information was discovered to be quite positive, the data demonstrating an approximate nine-fold multiplier effect for three diffusion modes studied.

Basotho chiefs and village headmen and headwomen likewise perceived generally enhanced KASA change levels in several subject matters taught in extension short courses as well as a similar reflective profile for changes in their practices as village leaders. However, for other subject matters this clientele reported high rates of non-learning and/or no recall resulting in negligible practice change. The data at hand do not suggest the underlying causes of this phenomenon. Because the ownership of cattle and use of the public range are strongly cultural among Basotho society, it is quite possible that accurate responses about such matters are not freely given. At the same time, these same traditional leaders benefited positively from the extension education programmes in question and were

unanimous in their support for farming systems research as a development strategy.

District-based extension workers and subject matter specialists in Lesotho also reported a widespread positive impact of farming systems research extension education programmes in the many subject matters taught. As might be expected among a more educated and discriminating group, there was higher variability in perceived levels of attainment in the subject matters in question. The group was likewise variable in the practice change that ensued in professional life, which might be related to the extension education programmes under study. However, examples described represented real breakthroughs in the demonstrated expertise of those involved.

Other findings were discovered or formulated during the study which are relevant to the development and improvement of future farming systems research and extension education programmes.

Farming systems research is a useful strategy in that it is interdisciplinary, and it engages the farmer directly in the dynamics. It is, however, not a panacea for low

agricultural productivity nor should it be considered as a "blueprint for Africa". The paradigm, as developed by the principal proponents (mainly agricultural economists) seems to have assumed too much with regard to the homogeneity of small farmers, their access to resources, their likemindedness, and their propensity toward adoption of "packages" or integrated farming schemes. The Lesotho experience indicates quite something else. Farmers are heterogenous with respect to access to resources and propensity toward change. They do adopt innovations but they do not voluntarily adopt packages. They pick and choose bits and pieces of a wide array of recommendations; prompted by such factors as affordability, family priority, personal resources, cultural or traditional values, risks involved and personal inclination. There seems to be little behavioural uniformity among the farm clientele. Adoption takes place through selective individual decision making. Yet, cumulative or collective practice change or adoption of innovations may still be significant over time.

Extension education is a necessary component in the agricultural development formula. Much literature evolving from the frustrations of failed development efforts lays blame for the infrequency of success at the doorstep of

ineffective extension systems. However, pretending that extension education is not necessary is to "pretend away" a vital link in the agricultural innovation continuum. Rather, extension education must be flexible, modifiable and adaptable to local resource levels in order to be successful. The Lesotho experience is a testimony to this.

Extension education is an art. As other arts respond to, and are influenced by, their times and environments; so too is extension education. Successful extension education depends on a subtle and delicate relationship between educator and student in which both learn from each other. The relationship is never static. Voiced constraints to extension successes frequently dwell on insufficiencies in materials, support and rewards for extension educators. As there is no environment so severe as to stifle art, there is likewise no environment so improverished as to prevent useful learning. Extension education can happen anywhere if it is scaled to the resource availability of both extension workers and farmers.

The Lesotho study suggests the existence of an "extension effect", a dynamic in which gains in the enhancement of knowledge, attitudes, skills, aspirations,

practice change and real benefits related to any agricultural innovation rise in direct proportion to the intensity and frequency of extension education programmes.

The position, so frequent in the literature, that extension education programmes in the developing world are designed for and directed at men is not corroborated by the Lesotho farming systems research and extension education experience. To the contrary, women farmers constituted nearly 75% of the farmer contact group membership and were responsible for most of the documented innovation. Women held 45% of the chiefs and headwomen positions and were among the more proactive in post-educational rural leadership. Women accounted for 30% of the district-based corps of agricultural professionals who participated in extension continuing education programmes, not only in domestic economics roles but also in agricultural responsibilities. The extension education programmes assessed in this study were not only designed to recognise a strong female presence but also reaped the rewards represented by that dynamic human resource.

It is significant that, in this study, Claude Bennett's (1982) reflective appraisal of programmes (RAP) evaluative

methodology was tested in a developing world setting, specifically a rural African setting. The methodology was adapted as necessary for the Lesotho milieu. It was felt that the response scores were uniformly quite high, higher than would have been seen in the American or European setting. They were highest among farmers, tending toward greater variability among chiefs and even more so among professional agriculturalists. This could be interpreted by some as bias or unsubstantiated optimism. It is interpreted in this research as something else. The opportunities for direct participation in extension education programmes for farmers in rural Lesotho are infrequent, while other factors of the daily environment are grossly routine. Thus, when a team of extension educators arrive in the area to conduct a course, the event, as well as the content represents a unique departure from the routine. Thus, the things that are learned, be they knowledge or skills, are magnified in the mind's eye and become reflected in subsequent perceptions. It is such that those same perceptions are reported with more enthusiasm and optimism than is the case among chiefs and more so among extension workers who are exposed to greater numbers of change agents and who have a wider range of educational opportunities. So, it seems that the RAP methodology, can be influenced by the environment in which

it is used. That does not, however, alter the idea that perceptions are being reported personally as the participant sees them and feels them. The more educated and more exposed the clientele, the more moderate and variable will be the responses. But, if learning is perception, then the RAP methodology retains its legitimacy in the field of extension programme evaluation.

A final conclusion is that more research into extension education in the developing world is desperately needed. The literature is rife with agricultural research findings, economic concepts, and unsubstantiated and uncorroborated pronouncements about the worth of extension education in the development formula. There are reports of extension education successes and there are reports of extension education failures. Unfortunately, not enough is known about either.

As the world approaches the millennium, humankind's supremacy as steward of the resource base will come under very severe pressure. Surely, its survival will depend in large part on its enlightenment as well as its ability to cope. It is certainly reasonable to suggest that the evolving field of extension education can contribute importantly to both.

APPENDIX A.1

INTERVIEW QUESTIONNAIRE (FCG)

Reflective Appraisal of Nonformal (Extension) Education Programmes Among Members of Farmer Contact Groups in Three Prototype Areas in Lesotho, 1981 - 1984.

1. Description of Programme

(Read this information to interviewee). Since 1981, the Research Division of the Ministry of Agriculture, through its Farming Systems Research Project, has brought educational programmes to you, the members of Village Agricultural Committees and Farmers Cooperatives, first at Farmers Training Centres and then at the Field Research Centers in the prototype areas. There have also been farmers field days in each area and radio programmes on farming matters broadcast each Saturday morning.

You have been chosen for interview because you were a participant in one or more of these educational activities. In this way you may share your responses with the division and assist directly in evaluating past experiences and improving future ones.

2. Biographical Data

(Read to interviewee, ask questions, and record the data) So that your needs and those of other farmers like you can best be served, the division would be pleased to know more about you. Please be so kind to share such information with your interviewer. The facts you share will not be linked to your name in any way, but will simply assist the division to better know the characteristics of the people it serves.

Age: _____ Sex: _____ Single: _____

Married: _____ Other: _____

Number of children: _____ Other _____ Ages: _____

Village or town: _____

Prototype area: _____

How long have you farmed? _____

Did you attend school? _____ Highest form completed: _____

Have you worked in the RSA? _____

If so, in what kind of work? _____

Do members of your immediate family now work in the RSA ? _____

How many? _____ In what kind of work? _____

Of which VAC or Farmers Coop are you a member? _____

Total length of VAC/FC membership: _____ As a VAC or FC

member, how many non-members have you told about new
agricultural information or practices? _____

How many have you "showed how" to farm in better ways? _____

How many do you think have learned better farming methods by
"observing" what you do on your farm? _____ How, or from
whom, do you learn most new farming information? _____

3. Inputs and People Involvement

(Read relevant section only) You will recall that the Agricultural Research Division conducted a series of courses for members of its VAC's and Farmers Coops since 1981 as follows:

1981 VAC short course at Mokhotlong FTC _____
1982 VAC short course at Mokhotlong FTC _____
1983 VAC short course at Mokhotlong FTC _____
1984 Farmers Coop short course at Molumong FRC _____

1981 VAC short course at Matela FTC _____
1982 VAC short course at Matela FTC _____
1983 VAC short course at Nyakosoba FRC _____
1984 Farmers Coop short course at Nyakosoba FRC _____

1981 VAC short course at Mohale's Hoek FTC _____
1982 VAC short course at Mohale's Hoek FTC _____
1983 VAC short course at Siloe FRC _____
1984 VAC short course at Siloe FRC _____

You were one of more than 194 participants who attended one or more of these courses. Please check which courses you attended.
Total: _____

The content of the courses consisted in: (Read slowly and/or hand interviewee a description of content in Sesotho).

- Agronomy
- seedbed preparation, seeds, manures, commercial fertilizers, winter fallowing, weed control, seed storage, time of planting, recommended varieties, crop culture on main crops.

- Horticulture
- seedbed preparation for vegetables, early production of cabbage, potato production, direct sowing of vegetables seeds, compost heap/pit, pruning of fruit trees, planting of young trees, vegetable types and varieties, fertilizers and manures, time of planting.
- Plant Protection
- control of smut in wheat and maize, control of aphids in cabbage,, stalk borer treatment, cutworm control, rodent control, common pests in the mountains, disease prevention and control.
- Farm Machinery
- calibration of ox-drawn planters, plow, and other equipment, yokes, harrows, demonstration of Areana equipment, modification of Safim equipment.
- Animal Management and the Range
- feeding of a dairy cow, grazing control regulations, rotational grazing, livestock and feeding of roughage (maize stover, wheat chaff, beans, peas, chaff, barley, cured oats), concentrates (grains, licks), starting a poultry flock, animal disease control (sheep scab, black quarter, blue tongue, pulpy kidney), animal management, breeding, culling nonproducers, proper stocking rates on the range, fodders, livestock importation policies.

Also in 1983-1984, farmers field days were held in Siloe (livestock), Nyakosoba (crops), and Molumong (crops). Altogether, 140 farmers attended these field days where more of the above subjects were seen and discussed. Did you attend one of these field days?_____

Radio programmes about these topics and others have been regularly broadcast for farmers over Radio Lesotho each Saturday morning. Do you own a working radio?_____ Do you listen to these programmes?_____ How often?_____ Do you learn well by radio?_____

4. Validation

(Read to interviewee and record response) According to your recollection of the course(s) you attended, the field day you may have attended, and the radio programmes you may have heard, is the above description of the Research Division's educational programmes (check one).

- _____ accurate so far as you know?
- _____ reasonably accurate?
- _____ not accurate?
- _____ don't know/don't recall.

5. Reaction

(Read to interviewee and record response) To what extent did these activities meet your expectations at the time? (check one)-

- _____ to a great extent
- _____ to a fair extent
- _____ to a slight extent
- _____ not at all
- _____ don't know/don't recall

6. Methods

(Read to interviewee and record response) In the short courses and field days described, a number of extension teaching methods were used. Which one do you prefer? (check one) -

- ☐ Illustrated talk
- ☐ Demonstration
- ☐ Field trip/field day
- ☐ Combination of above

Which venue did you like better for the short courses? (check one) -

- ☐ Farmers Training Centers
- ☐ Field Research Centers

Why? _____

7. Reflection

(Read to interviewee and allow prescribed time for reflection) Please take 10 minutes to think back on the content of the educational activities in which you participated and on what it has meant to you in your farming activities. Your interviewer will assist you at your request.

8. Responses, KASA and Practice Change

(Read questions from RAP and record responses). This part of the interview will determine certain results of these educational programmes as you, a farmer, perceive them. Your interviewer will ask you some questions and record numbers which correspond to your answers.

Example: (for interviewer)

To what extent did you learn more about farm machinery?

- _____ to a great extent (3)
- _____ to a fair extent (2)
- _____ to a slight extent (1)
- _____ not at all (0)
- _____ other (Z)

Interviewer: Please use the following matrix to record numbers which corresponds to interviewee's responses.

	A	B	C	D	E
Content	Knowledge	Attitude	Skills	Aspirations	Practice Change
1. Agronomy					
2. Horticulture					
3. Plant Protection					
4. Farm Machinery					
5. Animal Mgt/Range					

Your responses have been most helpful.

.

(Read to your interviewee and write out responses). Some of your responses are very interesting. Please be so kind to discuss or explain them further. Perhaps you could give some examples. (Interviewer; this is an example: "You indicate that you acquired a great deal of skill in calibrating ox-drawn machinery. Can you describe that skill?" Also, please have interviewee explain any item marked "Z" on the matrix.)

[illegible]

10. About Your Farm (Closed-end Probes)

(Interviewer, read aloud to interviewee and record responses) In trying to improve farmer education programmes and direct them toward the real needs of the farming community, it is important to know something about your farm. Please share the following information with your interviewer:

- How large is your farm ? _____
- What crops do you grow ? _____
- What kind of animals do you graze on the range ? _____
- _____
- How many of each ? _____
- Do you have a herd boy ? _____
- Is he a member of your family ? _____
- Do you milk cows ? _____ How many ? _____
- Do you keep poultry ? _____ How many ? _____
- Do you keep pigs ? _____ How many ? _____
- How many members of your family work on your farm ? _____
- Do you grow a home garden ? _____
- Do you share a communal garden ? _____
- What vegetables do you grow ? _____
- Do you weed your crops and vegetables ? _____
- How ? _____
- Do you control insects and plant diseases ? _____
- Do you hire outside labour ? _____
- Do you own machinery ? _____
- What kind ? _____
- On your farm, do you produce more than your family and animals consume ? _____
- Of what commodities ? _____
- How do you market them ? _____
- Where ? _____
- Do you keep farm records ? _____

11. End Results

(Read to interviewee and record responses) How have the changes you have made as a result of these educational programmes benefited you and your family? (Check as many as are appropriate).

- More income from farming _____
- More trading with neighbours _____
- Acquisition of more property _____
- What kind? _____
- Acquisition of better animals _____
- Stored and/or preserved food _____
- Better meals for family _____
- Better education for children _____
- Higher crop yields _____
- Better condition of animals _____
- Able to purchase improved inputs _____
- Able to secure credit/loans _____
- Improved farm records _____
- Better markets _____
- Other _____
- No significant benefits _____

12. Constraints

(Read to interviewer and record comments) If there were changes

you really wanted to make on your farm but were unable to do so, please explain why.

13. Recommendations

(Read to interviewee and write out comments) What suggestions do you have for the improvement of Research Division's farmer education programmes ?

- a. _____
- b. _____
- c. _____
- d. _____

Thank you for your participation in this interview. In this way you have directly assisted your ministry in continuing to meet your needs.

APPENDIX A. 1.1

LIPOTSO (F)

Lipatlisiso Malebana le Thuto ea Batho ba Baholo Litsing tse Tharo tsa Lipatlisiso, e Leng Siloe, Nyakosoba le Molumong:
1981 - 1984

1. Thlaloso ea Morero

(Balla sehoai karolo ena). Ho tloha ka 1981, Lekalana la Lipatlisiso, la Lekala la Temo, ka Morero oa Lipatlisisotsa Temo, le tlisitse mananeho a thuto ho Likomiti tsa Metse tsa Temo le Likoporasi.

Qalong lithupelo li ne li da Litsing tsa Thupelo ea Lihoai, khabareng tsa eba Litsing tsa Lipatlisiso tsa temo tse metseng ea lona e khethetsoeng tsebetso ena. Ho bile le matsatsi a lihoai, hape ho hasoa mananeho a temo ka Moqebelo hoseng se-ea-le-moeeng.

Ka ha u kile ua kenela e ngoe ea lithupelo tsena, na u kat bolela maikutlo, a hau e le ho thusa ho hlahloba merero e fetileng le ho ntlafatsa meralo e tlang.

2. Tsa Bophelo ba Sehoai

(Balla sehoai karolo ena, me u ngole likarabo tsohle). A ku hlalose hantle ka boemo ba lona, ele hore Lekalame le tle le tsebe ho khahlametsa litihoko tsa lona. Tsohle e tla ba lekunutu 'me li tla sebelisoa feela ho thusa lipatlisisong tsa temo.

Lilemo:_____ Monna:_____ U nyetse ?_____

Mosali:_____ U nyetsoe ?_____

Lesooa:_____ Tse ling:_____

Bana ba bakae? _____

Lilemo tsa bona: _____
Motse oa heno ke: _____
Sebaka sa lipatlisiso: _____
Ke nako e kae u le sehoai? _____
Na u kile oa kena sekolo? _____
U tsoile u bala eng? _____
Na u kile oa sebetsa RSA? _____
Haeba ho jaole, u ne u sebetsa eng? _____
Na ba heno ba teng ba sebetsang RSA? _____
Haeba e, ba bakae ? _____ Ba sebetsa eng? _____
Na ho teng bang ka uena ba ntseng ba sebetsa RSA? _____
Ba ba kal ka palo? _____ Mosebetsi oo
ba _____ u _____ etsang _____ ke _____ ofe?
U setho sa VAC kapa mokhatlo ofe? _____
U bile setho nako e kae? _____
Ke batho ba bakae bao u ba boleletseng ka mekhoha e mecha ea
temo ? _____
Ba u ba bontsitseng bona ba bakae? _____
Ke ba bakae bau u hopolang hore ba ithutile mekhoha e nepahetseng
ka ho sheba ha u ntse u sebetsa ha hau? _____
U ithuta ho mang kapa joang mekhoha e mecha ea temo? _____

3. Thepa ea temo le Basebetsi

(Bala feela ho hlokahalang). Ba Lekalana la Lipatlisiso tsa Temo ba ile ba etsetsa Likomiti tsa Temo le Likoporasi lithupelo tse ngatanyana ho tloha ka 1981 ka tsela ena e latelang:

Molumong

1981 Thupelo ea VAC Mokhotlong FTC _____

1982 Thupelo ea VAC Mokhotlong FTC _____

- 1983 Thupelo ea VAC Mokhotlong FTC _____
1984 Thupelo ea likoporasi Molumong FRC _____

Nyakosoba

- 1981 Thupelo ea VAC Matela FTC _____
1982 Thupelo ea VAC Matela FTC _____
1983 Thupelo ea VAC Nyakosoba FRC _____
1984 Thupelo ea likoporasi Nyakosoba FRC _____

Siloe

- 1981 Thupelo ea VAC Mohale's Hoek FTC _____
1982 Thupelo ea VAC Mohale's Hoek FTC _____
1983 Thupelo ea VAC Siloe FRC _____
1984 Thupelo ea VAC Siloe FRC _____

U ne u le e mong oa batho ba fetang 194 ba keneng tse ling tsa lithupelo tsena. U ile, oa kena tse kae ? Kakaretso

Lithupelong tsena ho ne ho rutoa tse latelang.
(Bala butle/kapa u nehe sehoai se ipalle)

- Temo ea lijalo

Tokiso ea mobu, lipeo, manyolo, menontsa, ho hlaola, ho phethola mariha, poloko ea lipeo, nako ea ho jala, lipeo tse khothaletsoang le mekhoha eo ijalo tse tloalehileng li sebetsoang ka eona.

- Temo ea Meroho

Tokiso ea leifo, temo ea moroho oa cabbage, temo ea litapole, ho jala tisimong ka kotloloho, ho etsa mosueloa, ho faola lifate tsa Litholoana, temo ea lifate tse nyenyane, mefuta ea lipeo tsa meroho, menontsa le manyolo, nako ea ho jala.

- Tsireletso ea Lijalo

Toantso ea phori ea koro le ea poone, toant'so ea hoaba morohong, phekolo ea seboko sa lehlaka, phekolo ea seseli, toant'so ea matsoete, t'sereletso ea lijalo mafung a tloaelehileng.

- Lisebelisoa tsa Temo

Tsebeliso ea polantere; mohama, sekofolo, lijoko, ekhe le tse ling. Tsupiso ea thepa ea Areana, le ntlafatso ea thepa ea Safim.

- Thlokomelo ea Liphoofolo le Lekhulo

Phepo ea khomo ea lebese, melao ea phuliso, karolo ea lekhulo ka likampong, phepo ea liphoofolo ka litlhaka tsa koro, poone, linaoa, lierekisi, harese le habore, matsoai a nyekoang, selakhapane, ieruo la likhoho, mafu a liphoofole le toantso ea one (lekhoekhoe, serotsoana, liphieo), tlohokomelo ea liphoofolo, tsoaliso le ntlafatso ea tsona phuliso e nepahetseng ea lekhulo, temo ea lifuru, melao e busang theko ea liphoofolo tse kenang.

Hape ka 1983-1984 ho ile ha t'souroa le matsatsi a Pontso ea Temo mane Siloe (liphoofolo), Nyakosoba (lijalo), Molumong (lijalo) Batho ka bang 140 ba ileng ba e ba teng ba bona le ha t'souroai. Lithuto tse hlalositsoeng ha holimo. Na u ile oa ba teng Pontsong toe? _____

Hona le mananeo a temo a hasoang ke Seea-le-moea sa Lesotho ka Mogebeho hoseng. na u na le radio e se-ea-le-moea e sebetsang ? Na u ee u mamelo mananeo ao ? _____ Ha kae ? Na u hlile u tseba ho ithuta hantle ka Seea-le-moea ?

4. Tiiso (Balla sehoai karolo ena)

Ho ea kamoo u hopolang lithupelo tsena esita le matsatsi ana a boithuto hammoho le mananeo a Seea-le-moea, na tlhaloso e sa tsoa fanoa ke ba Lipatlisiso tsa ka temo tsona: (t'soaea e le ngoe)

_____ E nepahetse ho ea kamoo ke tsebang

_____ E batla e nepahetse

_____ Ha e ea nepahala

_____ Ha ke tsebe/ha ke sa hopola

5. Likarobo tse Akarentsang

(Balla sehoai). Ke thuso e kae eo u e fumaneng lithupelong tsee?

_____ E kholo

_____ E lekaneng

_____ E fokolang

_____ Ha ho thuso

_____ Ha ke tsebe/ke lebetse

6. Mekhoa

(Balla sehoai). Ho lithupelo tse seng li hlalositsoe ho ile ha sebelisoa mekhoe e fapaneng ea ho ruta. Ke mekhoe ofe oo uena u o ratang?

(Ketha o le mong)

_____ Ho buoa

_____ Ho etsa litsupiso

_____ Ho ea masimong le ilo ithutela teng (sheba)

_____ Motsoako oa tse ka holimo

U rata ha lithupelo lika tsoareloa hokae ? (ketha e le ngoe)

Litsi tsa Thupelo ea Lihoai

Litsi tsa lipatlisiso

Hobaneng?

7. Bontsa

(Balla sehoai, mo fe nako ho nahana, bonyane metsotso e leshome) ke kopa u ke u nahane ka lithupelo tsena tseo u kileng oaba ho tsona me u tlo mpoelle hore na li entse eng malebana le mekhoha ea temo ea hau.

8. Karabo

(Bala lipotso tse pampiring ea RAP u li botse sehoai). Karolo ena ea lipotso e tla thusa ho etsa liqeto malebana le lithupelo tsena ho latela kamoo uena u le sehoai u li boneng kateng. Linomoro litla sebelisoa ho qaqisa karabo tsa hau.

Mohlala

U ile oa ithuta hakae ka thepa ea masimong ?

_____	haholo	(3)
_____	holekana	(2)
_____	hanyenyane	(1)
_____	haho letho	(0)
_____	hake tsebe ke lebetse	(X)
_____	tse ling	(Z)

(Hlokomela ho sebelisa lipalo tsena ho bont'sa likarabo tsa sehoai)

	A	B	C	D	E
					Jsebeliso
					ea
<u>Lenaneo</u>	<u>Tsebo</u>	<u>Maikutlo</u>	<u>Bokhom</u>	<u>Boikemisetso</u>	<u>Phetoho</u>
<u>Temo ea lijalo</u>					
<u>tša masimong</u>					
<u>Temo ea meroho</u>					
<u>Tsireletso</u>					
<u>ea lijalo</u>					
<u>Thepa ea masimong</u>					
<u>Tlhokomelo ea</u>					
<u>liphoofolo</u>					
<u>le lekhulo</u>					
<u>Re lebaha</u>					
<u>likarabo tsa ha</u>					

9. Botsisisa

(Balla sehoai karolo ena hau qeta (botsa lipotso). Tse ling tsa likarabo tsa hau lia phephetsa. Ka lebaka lena ke kopa u be mosa ho li buisana le 'na haholoanyane. (Fana ka mehlala) e.g. haeba u bontsa hore u ithutile ho etsa hohong malebana le thepa e huloang ka likhomo u bolele. Kapa ha u re ha u ea ithuta letho u kaka oa hlalosa hore ke hobaneng.

Likarabo

Litlhaloso

10. Ka Polasi ea hau (Balla sehoai u nto botsa).

Malebana le tokiso ea mananeo a boithuto ba sehoai le ho leka ho a etsa ka tsela eo a tla khotsofatsa litlhoko tsa sebaka, ke bohlokoa ho tseba ka tsa polasi ea hau. Ka kopo arolelana le 'na litabeng tsena tse latelang.

Polasi ea hau e boholo bo bokae? _____

U lema lijalo life? _____

Liphoofolo tsea u li alosang ke life? _____

_____ Li kae ka palo?

_____ Na u na le molisana?

_____ Na ke oa lelapa?

_____ U na le likhomo tsa lebese? Tse kae? _____

_____ U na le likhoho? Tse kae? _____

_____ U na le likolobe? Tse kae? _____

- Ke ba bakae ba lelapa ba sebetsang polasing ea hau? _____

- Na u na le jareta ea meroho? _____

- Na u setho sa jarete ea kopanelo? _____

- Ke meroho efe eo u e lehang? _____

- Na u ee u hlaolele lijalo tsa hau? _____

- Joang? _____

- Na u ee u loant'se mafu le likokoanyana? _____

- No u ko hire basebesti? _____

- Na u na le thepa ea masimong? _____

- Ke efe? _____

- Na u ee u chae lijo tse ngata hofeta tseo ba lelapa le
liphoofolo ba ka lijang? _____

- Ke lijo tsa mofuta ofeng tseo? _____

- U ee u li rekise joang? _____

- Hokae? _____

- Na u boloka Libuka tsa polasi? _____

11. Litholoana (Balla sehoai karolo ena u nto 'motsa lipotso).

Liphetoho tse bileng teng ho uena haesale u tsamaea lithupelo tse li thusitse lelapa la hau joang ? (Mona u ka tsoaea likarabo tse ngata).

Chelete e tsoang temong e bile ngata _____
Ke tsebile ho rekisetsa baahelani _____
Ke atlebile hoba le thepa e ngata _____
Ke thepa ea mofuta ofeng ? _____
Ke atlehile hoba le liphoofole tse ntle ? _____
Ke tsebile ho boloka lijo ? _____
Ke tseba ho fepa lelapa lijo tse ntle _____
Ke atlehile ho fumantsa bana thuto e ntle _____
Ke atlehile ho chaea _____
Liphoofole tsaka li maemong a matle _____
Ke tsebile ho kenya thepa e ntle ea temo _____
Ke tsebile ho fumana mokitlane oa kemo _____
Libuka tsaka tsa temo li ntle _____
Maraka o motle _____
Tse ling _____
Ha ho letho leo ke le fumaneng _____

12. Mathata

(Balla sehoai u nto botsa lipotso). Haeba ho na le liphetoho tseo u neng u rata ho li etsa polasing ea hau empa ua sitoa, li bolele u bo bolele hore na u ile oa sitisoa keng.

13. Likhothaletso

Ke lintho life tseo u ka ratang hore li etsoe ele ho ntlafatsa mananeo aa a Lehalama la Lipatlisiso tsa Temo boithutong ba sehoai ?

a. _____

b. _____

c. _____

d. _____

Ke leboha mamello ea hau me ke u tiisetse hore kajeno u re thusitse Lekala la Temo haholo malebana le ho khotsofatsa Litlheko tsa lihoai.

APPENDIX A.2

INTERVIEW QUESTIONNAIRE (CHMW)

Reflective Appraisal of Non-formal (Extension) Education Programmes Among Chiefs and Headmen/women in Three Prototype Areas of Lesotho.
1983 - 1984

1. Description of Programme

During 1983 and 1984, the Research Division of the Ministry of Agriculture, through its Farming Systems Research capability, held two short courses at the Matela FTC for chiefs, headmen and headwomen from the FSR prototype areas of Molumong, Nyakosoba and Siloe. The courses were held in February of each year and were of one week duration. The content of the courses included:

- (a) leadership styles and communication skills
- (b) role of chiefs in agricultural development
- (c) role of farmer contact groups (VAC's or Coops)
- (d) role of chiefs as facilitators of farmers' groups
- (e) chiefs' attitudes toward agriculture
- (f) farming systems research concept
- (g) agronomy research in grains and crops
- (h) 1979 Land Act in regard to agricultural development
- (i) Chieftainship Act of 1968
- (j) grazing control regulations
- (k) rotational grazing
- (l) range research in the prototype areas
- (m) stocking rates
- (n) livestock policy and production
- (o) importation of livestock
- (p) the abattoir
- (q) animal science activities in prototype areas
- (r) anti-erosion works regulations
- (s) forestry and woodlot project policies

2. Validation and People Development

Your name has been selected for interview because you were one of 36 persons who attended one or both of these course. Your responses to the questions will remain confidential and will not be identified with your name. However, they will be most valuable in helping the ministry improve its educational programmes and meet your needs more effectively.

Did you attend one____or two____short courses?

According to your recollection of the course(s) described above, is that description:

- _____ accurate so far as you know
- _____ reasonably accurate
- _____ not accurate
- _____ don't know/don't recall
- _____ other

3. Reactions

To what extent did the course(s) meet your expectations at the time?

- _____ to a great extent
- _____ to a fair extent
- _____ to a slight extent
- _____ not at all
- _____ don't know/don't recall
- _____ other

4. KASA and Practice Changes

This exercise will seek to determine changes in knowledge, attitudes, skills and aspirations about the course content which you experienced as a result of your participation, as well as changes in actual practices. Interviewer: please ask the appropriate questions (RAP Guide) and record responses in matrix. Example: To what extent did you learn more about grazing control regulations?

_____ to a great extent	(3)
_____ to a fair extent	(2)
_____ to a slight extent	(1)
_____ not at all	(0)
_____ don't know/don't recall	(X)
_____ other	(Z)

	A	B	C	D	E
Content	Knowledge	Attitudes	Skills	Aspirations	Practice Change
1. Leadership Styles & Communications					
2. Role of chiefs in Agric. development					
3. Role of farmer contact groups (VAC's)					
4. Role of chiefs as facilitators of groups					
5. Chiefs' attitudes toward agriculture					
6. Family systems research concept					
7. Agron research in grain & crops					
9. Chieftainship Act of 1968					
10. Grazing control regulations					
11. Rotational grazing					
12. Range research in prototype areas					
13. Stocking rates					
14. Livestock policy & production					
15. Importation of livestock					
16. The abattoir					
17. Animal science in prototypes					
18. Anti-erosion work reg's					
19. Forestry/woodlot policies					

Some of your responses are very interesting. In order to learn more about what you have indicated, please be so kind as to explain or give some examples.

<u>Response</u>	<u>Comments</u>

5. Other Information and End Results

In order to make programmes more responsive to your particular situation, please share some personal information with your interviewer.

Age _____ Sex _____ Village/Town _____
How long have you served as Chief ? _____
Are you active in decision-making about agriculture ? ____
Have you benefited significantly from the Research
Division's educational programmes ? _____
Do you actively support farming systems research as a
development strategy ? _____
Why ? _____

6. Recommendations

In order to assist your ministry in its own growth and effectiveness, what recommendations do you have about the educational programmes thus far?

- (a) _____
- (b) _____
- (c) _____
- (d) _____

Thank you for your cooperation and participation in this important fact-finding exercise.

APPENDIX A.2.1

LIPOTSO

Lipotso Ntlafatsong Ea Thuto Ea Batho LBa Baholo E Ileng Ea Etsetsoa Marena Le Borametse Siloe, Molumong Le Nyakosoba.

1. Tlhaloso:

Ka 1983 - 1984 lefapha la Lipatlisiso tsa temo Lesotho le ile la etsetsa marena lithupelo tse peli tse khutsoane ha matela. Marena a tlileng a ne a etsoa Siloe, Molumong le Nyakasoba. Lithupelo tsena li ile tsa etsoa ka khoeli ea hlakubele, 'me li ne li etse matsatsi a mahlano.

Lithuto tse rutiloeng ebile tsena:

- (a) Boetapele le phetiso ea melaetsa
- (b) Boikarabello ba marena khulisong ea moruo oa temo
- (c) Boikarabello ba likomiti tsa temo
- (d) Boikarabello ba marena likomiting tsa temo
- (e) Lipatlisiso holima lijo thollo le lijalo
- (f) Molao oa kabo le kamoho ea mobu oa 1979 mabapi le nt'setsopele ea emo
- (g) Molao oa marena oa 1968
- (h) Molao oa phuliso
- (i) Phuliso ka likampo lekhulong
- (j) Lipatlisiso tsa makhulo Molumong, Siloe, Nuakosoba
- (k) Tekanyeto ea liphoofolo lekhulong
- (l) Molao oa theko le thekiso esita le keketso ea liphoofolo
- (m) Selakhapane
- (n) Thibelo ea khoholeho ea mobu
- (o) Temo ea lifate

2. U emong oa ba khethiloeng ho botsoa lipotso ho ba 36 ba ileng ba eba lithupelong tsena. Likarabo tsa hau lipotsong tsena ke lekunutu, ebile haho moo lebitso la hau le tla hlaha; feela likarabo tsa hau li tla sebelisoa ke ba lekala la temo ho leka ho khotsofatsa litakatso tsa sechaba.

Na u bile teng ho e ngoe _____ kapa tse peli tsa lithupelo tsee ?

ho latela kamoo u hopolang na lethathamo la lithuto le fanoeng ka holimo

_____ le nepahetse kamoo ke tsebang
_____ batla le nepahetse
_____ ha le ea nepahala
_____ ha ke tsebe
_____ tse ling

3. Ke hakae u ileng oa khotsofatsoa ke lithupelo tsee

_____ haholo
_____ ho lekana
_____ ha nyenyane
_____ ha ke ea ka ka khotsofala
_____ ha ke sa hopola
_____ tse ling

4. Károlo ena e tla thusa ho re bontsa hore na lithupelo tsena li u file eng malebana le tsebo e ncha, maikutlo, thahasello le mekhoa e mecha (mobotsi bala lipotso tse pampiri ea RAP u li botse sehoai joale u nto ngóla likarabo).

Mohala:

Thuto ea molao oa phuliso e u thusitse hakae

_____	haholo	(3)
_____	ho lekana	(2)
_____	ha nyenyane	(1)
_____	hka e ea nthusa	(0)
_____	ha ke sa hopola	(X)
_____	tse ling	(Z)

(balla morena karolo ena)

Ke u koḡa hore u ke u nke metsotso e seng mekae ho nahana ka lithuto tse ileng tsa fanoa lithupelong tseo, le hore na ege li bile le molemo ofe ho uena malebana le tse latelang:

Karabo Litlhaloso/Litlatsetso

Litlhaloso/Litlatsetso

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5. E ka khona lithupelo tsa rona li khahlanyetse maemo a
itseng a hau, ka lebaka lena aku be mosa ho arolelana le rone
lintha tsean tse latelang ka uena.

Lilemo_____ Monna_____ Motse
Mosali_____

Ke nako e kae u le morena_____
Na u na le thahasello wa ho etsa liqeto tse amanang le
tsebetso ea temo_____
Na ho na le molemo oo u o fumaneng lithupelong tse entsoeng
ke ba lipatlisiso tsa temo ? _____
Na u na le thahasello ea ho thusa ba morero oa lipatlisiso
tsa temo, ntsetsong pele ea moruo oa temo ? _____
hobaneng ? _____

6. Ke lintho life tseo u ratang hore li ntlafatsoe kapa li
eketsoe lithupelong tse tla tsoaroa. Karabo ea hau e tla
thusa lekala la temo haholo nakong eo lithupelo li reroang.
Hape hona ho tla thusa muso hore o hole o be matla.

- (a) _____
(b) _____
(c) _____
(d) _____

Ke leboha mamello ea hau le thahasello eu u bileng le eona
lipotsong tsena tse fanang ka lintlha tsa bohlokoa.

	A	B	C	D	E
Lenaneo	Tsebo	Maikutlo	Mokhoa	Boikeymisetso	Phetoho
Boetapele le phetiso ea melaetsa					
Tsebetso ea ma- rena ntlafatsong ea temo					
Boikarabelo ba likomiti tsa temo					
Tsebetso ea mo- rena likomiting tsa temo					
Maikutlo a marena ka temo					
Liphuputso tsa mekhoa ea temo					
Lipatlisiso ka lijo thollo le lijalo					
Molao oa kabo le kamoho ea mobu 1979					
Molao oa marena oa 1968					
Molao oa phuliso lekhulong					
Phuliso ka likampo lekhulong					
Lipatlisiso tsa makhulo					
Tekanyetso ea lip- hoofolo lekhulong					
Theko, thekiso le keketso ea liphoofolo					
Selakhapane					
Outo ea ruo la hoofolo bekeng ea Khethiloeng					
Thibelo ea Khoholeho ea mobu					
Temo ea lifate					

APPENDIX A.3

INTERVIEW QUESTIONNAIRE (M)*

Reflective Appraisal of Non-formal (Continuing) Education Programmes Among District-Based Extension Workers and Subject Matter Specialists in Lesotho
1982 - 1984

1. Description of Programme

Over the past three years, the Research Division of the Lesotho Ministry of Agriculture and Marketing, operating with a farming systems focus, has conducted a series of courses for the benefit and professional improvement of district-based ministry personnel. Over 350 professionals participated in these courses which were designed to enhance their extension skills and subject matter capabilities. Your name has been chosen for interview because you were one of those participants. This is your opportunity to assist the Research Division in assessing the impacts of past educational programmes and improve upon future ones.

2. Biographical Data

In order that this interview might result in improved educational programmes for you and others like you, it is necessary to relate the outcomes to certain personal and professional characteristics. Please be so kind to supply the following information about yourself:

Age: _____ Sex: _____
Single: _____ Married: _____ Other: _____
Number of children: _____
Years of MOA service: _____
Current position: _____
Location: _____
Types of people you work with: _____
Type of work: _____
Raised in a farming family? _____
Do you yourself farm? _____
If so, what crops/animals? _____
Level of pre-agricultural education: _____
Level of agricultural education: _____
College or university: _____

Thank you for your participation in this exercise.

* Mazenod

3. Inputs and People Involvement

Research Division conducted a two-week short course at Mazenod, February 15-26, 1982. The name of this course was "Extension for the Improvement of Farming Systems". You were one of 31 people who attended the course. The content of the course consisted in:

- | | |
|--------------------------|-----------------------------------|
| - extension in Lesotho | - communications skills |
| - your organisation | - programme development cycle |
| - cultural constraints | - common extension methods |
| - lay leadership | - teaching agriculture |
| - motivation | - writing extension objectives |
| - programme evaluation | - village agricultural committees |
| - appropriate technology | - farming systems research |
| - agronomy | - farm management |
| - soils | - marketing |
| - forestry | - range ecology |

4. Validation

According to your recollection of this course, is this account of the programme

- _____ accurate so far as you know
_____ reasonably accurate
_____ not accurate
_____ don't know/don't recall

5. Reaction

To what extent did the course meet your expectations at the time?

- _____ great
_____ fair
_____ slight
_____ not at all
_____ don't know/don't recall

6. Methods

Four instructional methods were used in this course, namely illustrated lecture, demonstration, field trip and group discussion. Rate these according to your personal learning needs even though a combination might be preferable to you.

- _____ Illustrated Lecture
- _____ Demonstration
- _____ Field Trip
- _____ Group Discussion

7. Reflection

Now take 10 minutes to refresh your memory on the content of the course and to reflect on its significance in your professional life.

8. Results

This exercise will determine the results of the course as perceived by you using the reflective appraisal of programme(s) (RAP) technique. You will be asked a series of questions regarding any changes in knowledge, attitudes, skills, aspirations, practice and end results as outcomes of instruction in the various topics taught in the course. Your responses will be recorded as the numerical equivalents of a standardised response scale.

Example:

To what extent did you learn more about extension teaching methods ?

- | | |
|-------------------------------|-----|
| _____ to a great extent | (3) |
| _____ to a fair extent | (2) |
| _____ to a slight extent | (1) |
| _____ not at all | (0) |
| _____ don't know/don't recall | (X) |
| _____ other | (Z) |

The following matrix will be used to record your responses for subsequent analysis.

You will be interviewed individually and your anonymity will be protected. Be honest and accurate in your responses. Your participation in this research is most appreciated.

	A	B	C	D	E	F
Content	Knowledge	Attitude	Skills	Aspirations	Practice Change	End Result
1.Extension Lesotho						
2.Your Organization						
3.Cult. Con- straints						
4.Lay Lea- dership						
5.Motivation						
6.Programme Evaluation						
7.Approp. Tech.						
8.Agronomy						
9.Soils						
10.Forestry						
11.Communi- cations						
12.Prog Dev Cycle						
13.Teaching Agric						
14. VAC's						
15. FSR Methods						
16. Farm Management						
17. Marketing						
18. Range Ecology						

In order to gain further knowledge about some of the matrix items, you are now asked to further explain, describe or give examples of certain of your responses. This will be of great importance to the Research Division as it seeks to improve its educational programmes and make them responsive to your needs. This is also your opportunity to explain any items marked "Z".

[illegible]

10. Recommendations

What suggestions do you have for the improvement of Research Division's continuing education programmes?

- (a) _____
- (b) _____
- (c) _____
- (d) _____
- (e) _____
- (f) _____

Thank you for your participation in this exercise. The final analysis of the information you have provided will be shared with you in due course. Your patience is appreciated.

APPENDIX A.4

INTERVIEW QUESTIONNAIRE (AH)*

Reflective Appraisal of Non-formal (Continuing) Education Programmes Among District-Based Extension Workers and Subject Matter Specialists in Lesotho
1982 - 1984

1. Description of Programme

Over the past three years, the Research Division of the Lesotho Ministry of Agriculture and Marketing, operating with a farming systems focus, has conducted a series of courses for the benefit and professional improvement of district-based ministry personnel. Over 350 professionals participated in these courses which were designed to enhance their extension skills and subject matter capabilities. Your name has been chosen for interview because you were one of those participants. This is your opportunity to assist the Research Division in assessing the impacts of past educational programmes and improve upon future ones.

2. Biographical Data

In order that this interview might result in improved educational programmes for you and others like you, it is necessary to relate the outcomes to certain personal and professional characteristics. Please be so kind to supply the following information about yourself:

Age: _____ Sex: _____

Single: _____ Married: _____ Other: _____

Number of children: _____

Years of MOA service: _____

Current position: _____

Location: _____

Types of people you work with: _____

Type of work: _____

Raised in a farming family? _____

Do you yourself farm? _____

If so, what crops/animals? _____

Level of pre-agricultural education: _____

Level of agricultural education: _____

College or university: _____

Thank you for your participation in this exercise.

* Airport Hotel

3. Inputs and People Involvement

Research Division conducted a two-week short course at Airport Hotel, Maseru, July 12-24, 1982. The name of this course was "Professional Improvements in Agricultural Extension". You were one of 30 people who attended the course. The content of the course consisted of:

- | | |
|-------------------------------------|----------------------------------|
| - philosophy of extension | - programme development cycle |
| - extension in Lesotho | - your agricultural career |
| - effective listening | - communications skills |
| - extension management | - farming systems research |
| - cultural implications | - needs assessments |
| - writing extension objectives | - demonstrations and field trips |
| - motivation skills | - lay leadership |
| - training and visit system | - effective pitsos |
| - village agricultural committees | - logistics in extension |
| - interrelationships in agriculture | - programme evaluation |
| - farm machinery | - marketing |
| - forestry | - agronomy |
| - plant protection | - soils and conservation |
| - animal science | - range science |
| - horticulture | - animal diseases |

4. Validation

According to your recollection of this course, is this account of the programme.

- _____ accurate so far as you know
_____ reasonably accurate
_____ not accurate
_____ don't know/don't recall

5. Reaction

To what extent did the course meet your expectations at the time?

- _____ great
- _____ fair
- _____ slight
- _____ not at all
- _____ don't know/don't recall

6. Methods

Four instructional methods were used in this course, namely illustrated lectures, field trips, demonstrations, and audio-visual presentations. Please rate these according to your own learning preference even though a combination might be preferable.

- _____ Illustrated Lectures
- _____ Field Trips
- _____ Demonstrations
- _____ Audio-Visual Presentation

7. Reflection

Now take 10 minutes to refresh your memory on the content of the course and to reflect on its significance in your professional life.

8. Results

This exercise will determine the results of the course as perceived by you using the reflective appraisal of programme(s) (RAP) technique. You will be asked a series of questions regarding any changes in knowledge, attitudes, skills, aspirations, practice and end results as outcomes of instruction in the various topics taught in the course. Your responses will be recorded as the numerical equivalents of a standardised response scale.

Example:

To what extent did you learn more about extension teaching methods?

_____	to a great extent	(3)
_____	to a fair extent	(2)
_____	to a slight extent	(1)
_____	not at all	(0)
_____	don't know/don't recall	(X)
_____	other	(Z)

The following matrix will be used to record your responses for subsequent analysis.

You will be interviewed individually and your anonymity will be protected. Be honest and accurate in your responses. Your participation in this research is most appreciated.

	A	B	C	D	E	F
Content	Knowledge	Attitude	Skills	Aspirations	Practice Change	End Results
1. Phil of Extension						
2. Agronomy in Lesotho						
3. Effectice Listening						
4. Extension Mgt						
5. Cultural Implications						
6. Writing Ext. Objectives						
7. Motivation Skills						
8. Train & Visit Systems						
9. Village Agric. Committees						
10. In/relationship Agric.						
11. Farm Machinery						
12. Forestry						
13. Plant Protec-tion						
14. Animal Science						
15. Horticulture						
16. Prog. Dev. Cycle						
17. Your Agric Career						
18. Comm. Skills						
19. Farm Systems Research						
20. Needs Assess-ment						

	A	B	C	D	E	F
Content	Knowledge	Attitude	Skills	Aspirations	Practice Change	End Results
21. Demon. & Field Trips						
22. Lay Leadership						
23. Effective Pitsos						
24. Logistics in Extension						
25. Prog. Evaluation						
26. Marketing						
27. Agronomy						
28. Soils and Conservation						
29. Range Science						
30. Animal Diseases						

9. Probe Questions

In order to gain further knowledge about some of the matrix items, you are now asked to further explain, describe or give examples of certain of your responses. This will be of great importance to the Research Division as it seeks to improve its educational programmes and make them responsive to your needs. This is also your opportunity to explain any items marked "Z".

Response	Comments

10. Recommendations

What suggestions do you have for the improvement of Research Division's continuing education programmes?

- (a) _____
- (b) _____
- (c) _____
- (d) _____
- (e) _____
- (f) _____

Thank you for your participation in this exercise. The final analysis of the information you have provided will be shared with you in due course. Your patience is appreciated.

APPENDIX A.5

INTERVIEW QUESTIONNAIRE (RD)*

Reflective Appraisal of Non-formal (Continuing) Education Programmes Among District-Based Extension Workers and Subject Matter Specialists in Lesotho
1982 - 1984

1. Description of Programme

Over the past three years, the Research Division of the Lesotho Ministry of Agriculture and Marketing, operating with a farming systems focus, has conducted a series of courses for the benefit and professional improvement of district-based ministry personnel. Over 350 professionals participated in these courses which were designed to enhance their extension skills and subject matter capabilities. Your name has been chosen for interview because you were one of those participants. This is your opportunity to assist the Research Division in assessing the impacts of past educational programmes and improve upon future ones.

2. Biographical Data

In order that this interview might result in improved educational programmes for you and others like you, it is necessary to relate the outcomes to certain personal and professional characteristics. Please be so kind to supply the following information about yourself:

Age: _____ Sex: _____
Single: _____ Married: _____ Other: _____
Number of children: _____
Years of MOA service: _____
Current position: _____
Location: _____
Types of people you work with: _____
Type of work: _____
Raised in a farming family? _____
Do you yourself farm? _____
If so, what crops/animals? _____
Level of pre-agricultural education: _____
Level of agricultural education: _____
College or university: _____

Thank you for your participation in this exercise.

* Research Division

3. Inputs and People Involvement

Research Division conducted a one-week training course at Maseru, August 1-6, 1983. The name of this course was "Plant and Soil Science". You were one of 26 people who attended the course. The content of the course consisted in:

- | | |
|---------------------|----------------------------|
| - agronomy | - horticulture |
| - potato production | - farm machinery |
| - soil conservation | - soil sampling techniques |
| - weed control | - fodder production |
| - farm management | - marketing |
| - extension | - communications |

4. Validation

According to your recollection of this course, is this account of the programme

- _____ accurate so far as you know
_____ reasonably accurate
_____ not accurate
_____ don't know/don't recall

5. Reaction

To what extent did the course meet your expectations at the time?

- _____ great
_____ fair
_____ slight
_____ not at all

_____ don't know/don't recall

6. Methods

Three instructional methods were used in this course, namely the illustrated lecture, the field trip and the demonstration.

Please rate these so far as your own learning needs are concerned, even though a combination might be best.

_____ Illustrated Lecture

_____ Field Trip

_____ Demonstration

7. Reflection

Now take 10 minutes to refresh your memory on the content of the course and to reflect on its significance in your professional life.

8. Results

This exercise will determine the results of the course as perceived by you using the reflective appraisal of programme(s) (RAP) technique. You will be asked a series of questions regarding any changes in knowledge, attitudes, skills, aspirations, practice and end results as outcomes of instruction in the various topics taught in the course. Your responses will be recorded as the numerical equivalents of a standardised response scale.

Example:

To what extent did you learn more about extension teaching methods ?

_____	to a great extent	(3)
_____	to a fair extent	(2)
_____	to a slight extent	(1)
_____	not at all	(0)
_____	don't know/don't recall	(X)
_____	other	(Z)

The following matrix will be used to record your response for subsequent analysis.

You will be interviewed individually and your anonymity will be protected. Be honest and accurate in your responses. Your participation in this research is most appreciated.

	A	B	C	D	E	F
					Practice	End
Content	Knowledge	Attitude	Skills	Aspirations	Change	Results
1. Agronomy						
2. Potato Prod						
3. Soil/Conserv						
4. Weed Control						
5. Farm Mgt						
6. Extension Meth						
7. Horticulture						
8. Farm Machinery						
9. Soil Sampling						
10. Fodder Product						
11. Marketing						
12. Communications						

9. Probe Questions

In order to gain further knowledge about some of the matrix items, you are now asked to further explain, describe or give examples of certain of your responses. This will be of great importance to the Research Division as it seeks to improve its educational programmes and make them responsive to your needs. This is also your opportunity to explain any items marked "Z".

[illegible]

10. Recommendations

What suggestions do you have for the improvement of Research Division's continuing education programmes ?

- (a) _____
- (b) _____
- (c) _____
- (d) _____
- (e) _____
- (f) _____

Thank you for your participation in this exercise. The final analysis of the information you have provided will be shared with you in due course. Your patience is appreciated.

APPENDIX A.6

INTERVIEW QUESTIONNAIRE (DB) *

Reflective Appraisal of Non-formal (Continuing) Education Programmes Among District-Based Extension Workers and Subject Matter Specialists in Lesotho
1982 - 1984

1. Description of Programme

Over the past three years, the Research Division of the Lesotho Ministry of Agriculture and Marketing, operating with a farming systems focus, has conducted a series of courses for the benefit and professional improvement of district-based ministry personnel. Over 350 professionals participated in these courses which were designed to enhance their extension skills and subject matter capabilities. Your name has been chosen for interview because you were one of those participants. This is your opportunity to assist the Research Division in assessing the impacts of past educational programmes and improve upon future ones.

2. Biographical Data

In order that this interview might result in improved educational programmes for you and others like you, it is necessary to relate the outcomes to certain personal and professional characteristics. Please be so kind to supply the following information about yourself:

Age: _____ Sex: _____

Single: _____ Married: _____ Other: _____

Number of children: _____

Years of MOA service: _____

Current position: _____

Location: _____

Types of people you work with: _____

Type of work: _____

Raised in a farming family ? _____

Do you yourself farm ? _____

If so, what crops/animals ? _____

Level of pre-agricultural education: _____

Level of agricultural education: _____

College or university: _____

Thank you for your participation in this exercise.

* District-based

3. Inputs and People Involvement

Research Division conducted a one-week Extension School in each district between November 1983 and April 1984. The name of this course was "The Extension Challenge". You were one of 272 people who attended the course nationwide. The content of the course consisted in:

- relation of research to extension
- needs assessments
- group formation and dynamics
- communication skills
- extension teaching methods
- visual aids
- motivation

4. Validation

According to your recollection of this course, is this account of the programme.

- _____ accurate so far as you know
- _____ reasonably accurate
- _____ not accurate
- _____ don't know/don't recall

5. Reaction

To what extent did the course meet your expectations at the time?

- _____ great
- _____ fair
- _____ slight
- _____ not at all
- _____ don't know/don't recall

10. Recommendations

What suggestions do you have for the improvement of Research Division's continuing education programmes?

- (a) _____
- (b) _____
- (c) _____
- (d) _____
- (e) _____
- (f) _____

Thank you for your participation in this exercise. The final analysis of the information you have provided will be shared with you in due course. Your patience is appreciated.

9. Probe Questions

In order to gain further knowledge about some of the matrix items you are now asked to further explain, describe or give examples of certain of your responses. This will be of great importance to the Research Division as it seeks to improve its educational programmes and make them responsive to your needs. This is also your opportunity to explain any items marked "Z".

[illegible]

	A	B	C	D	E	F
	Content	Knowledge	Attitudes	Skills	Aspirations	Practice Change
1. Relation R to E						End Results
2. Needs Assessment						
3. Group F & D						
4. Ext. Tch. Meth.						
5. Visual Aids						
6. Motivation						

6. Methods

Only one instructional method was used in this course, namely the illustrated lecture. You will be given the opportunity to comment on this aspect later in the interview.

7. Reflection

Now take 10 minutes to refresh your memory on the content of the course and to reflect on its significance in your professional life.

8. Results

This exercise will determine the results of the course as perceived by using the reflective appraisal of programme(s) (RAP) technique. You will be asked a series of questions regarding any changes in knowledge, attitudes, skills, aspirations, practice and end results as outcomes of instruction in the various topics taught in the course. Your responses will be recorded as the numerical equivalents of a standardized responses scale.

Example:

To what extent did you learn more about extension teaching methods?

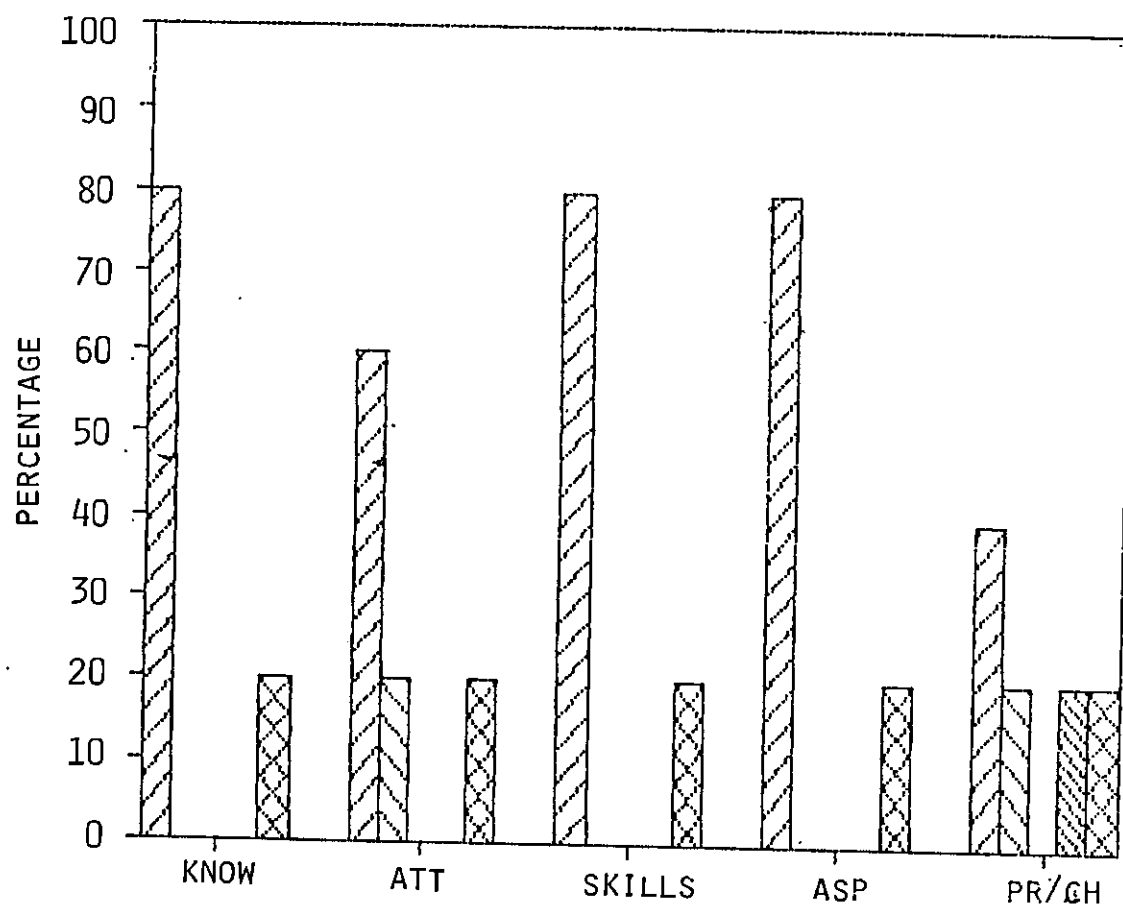
_____ to a great extent	(3)
_____ to a fair extent	(2)
_____ to a slight extent	(1)
_____ not at all	(0)
_____ don't know/don't recall	(X)
_____ other	(Z)

The following matrix will be used to record your responses for subsequent analysis.

You will be interviewed individually and your anonymity will be protected. Be honest and accurate in your responses. Your participation in this research is most appreciated.

APPENDIX B.1: KASA AND PRACTICE CHANGE IN AGRONOMY FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH A (1 COURSE)
AGRONOMY



3 2 1 0 Z

3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

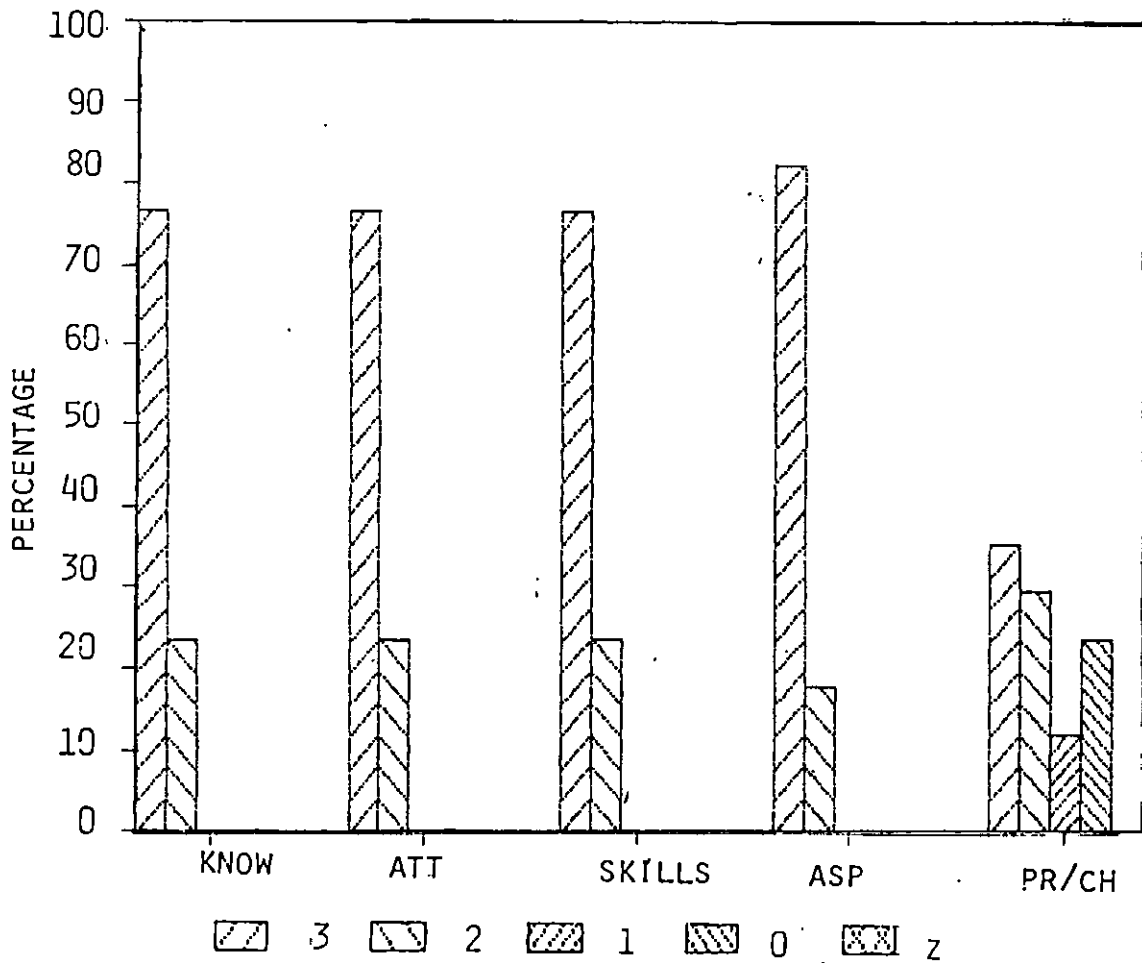
1 = TO A SLIGHT EXTENT

0 = NOT AT ALL

Z = OTHER

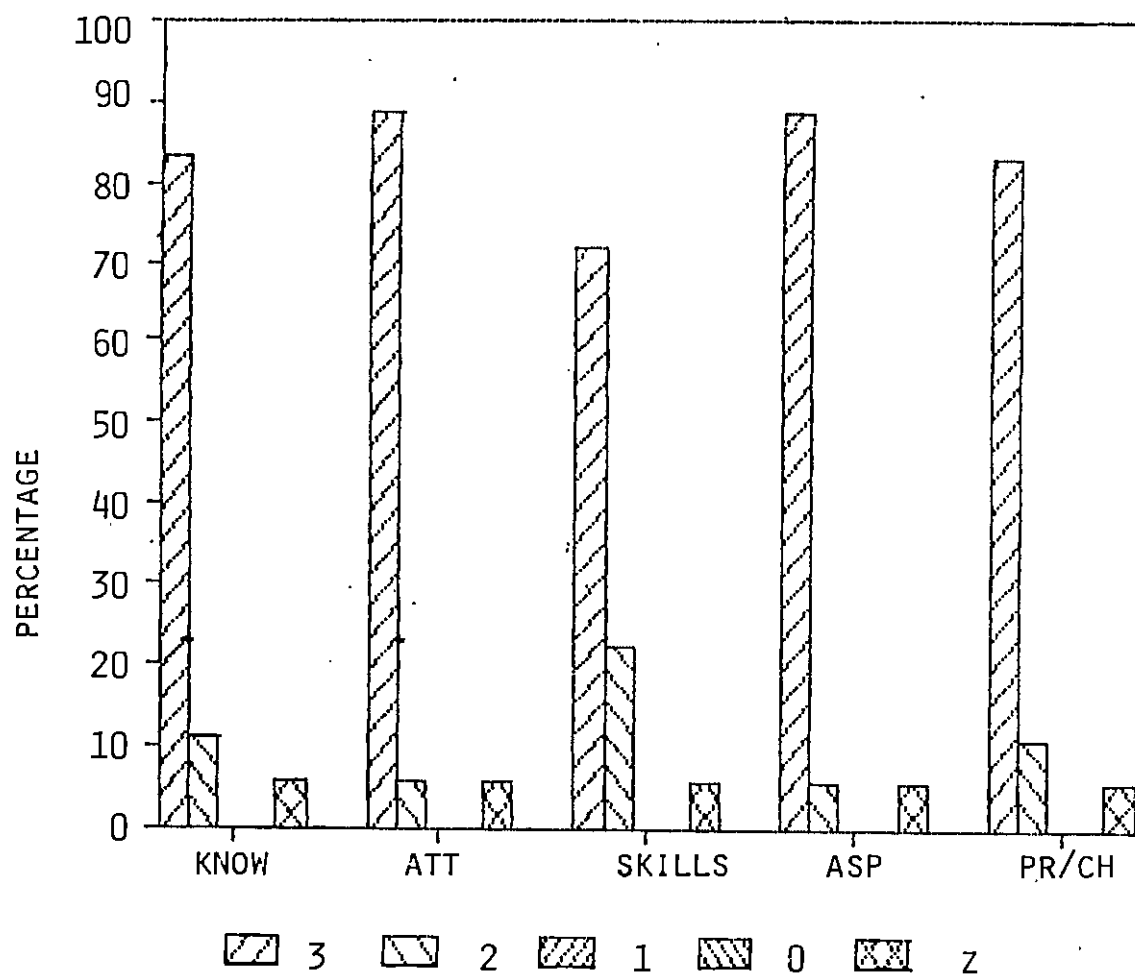
APPENDIX B.1: KASA AND PRACTICE CHANGE IN AGRONOMY FOR
RESPONDENTS ATTENDING INCREASING NUMBERS
OF EXTENSION EDUCATION COURSES, LESOTHO,
1985.

GRAPH B (2 COURSES)
AGRONOMY



APPENDIX B.1: KASA AND PRACTICE CHANGE IN AGRONOMY FOR
RESPONDENTS ATTENDING INCREASING NUMBERS
OF EXTENSION EDUCATION COURSES, LESOTHO,
1985.

GRAPH C (3 COURSES)
AGRONOMY



3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

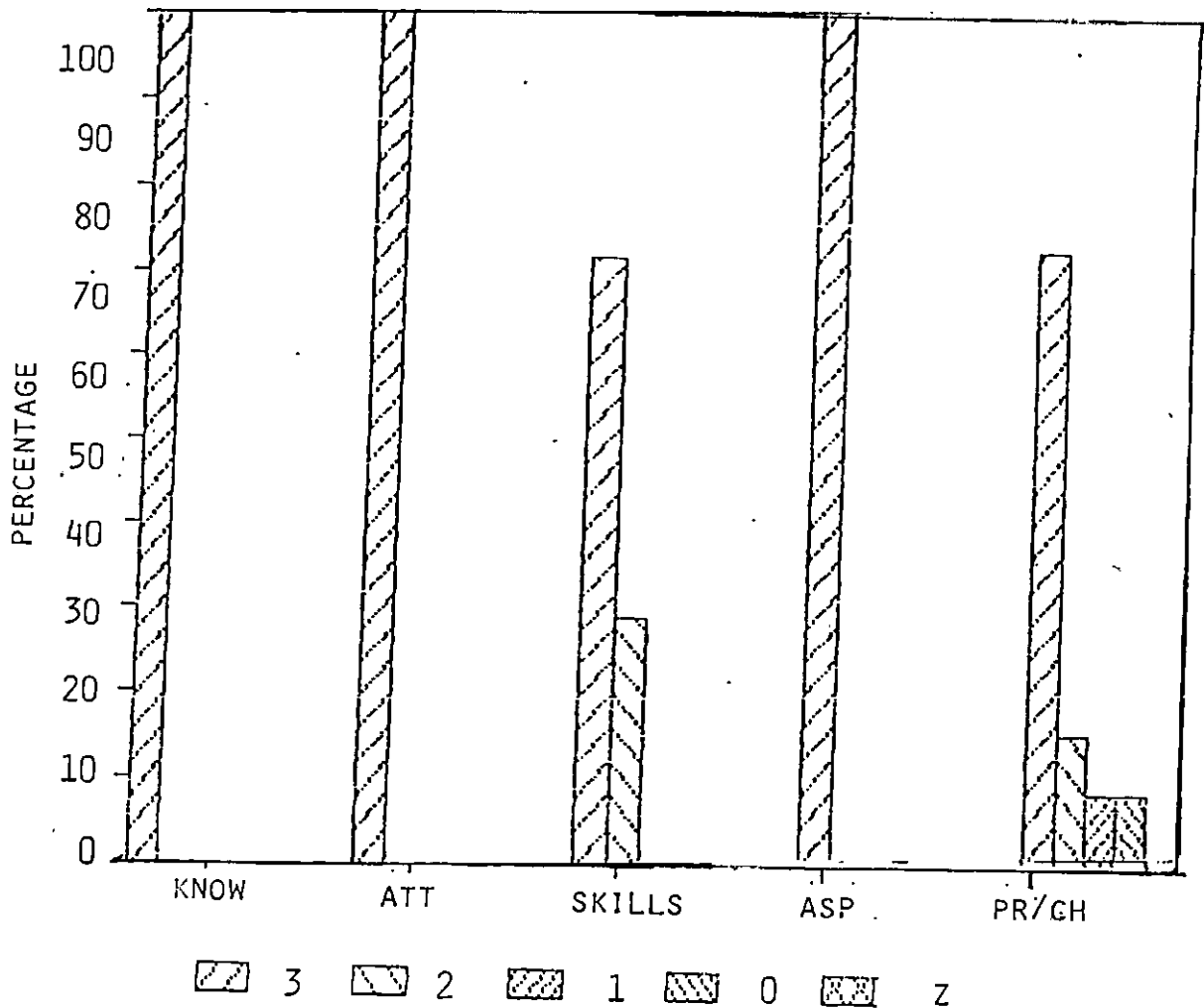
1 = TO A SLIGHT EXTENT

0 = NOT AT ALL

Z = OTHER

APPENDIX B.1: KASA AND PRACTICE CHANGE IN AGRONOMY FOR
RESPONDENTS ATTENDING INCREASING NUMBERS
OF EXTENSION EDUCATION COURSES, LESOTHO,
1985

GRAPH D (4 COURSES)
AGRONOMY



3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

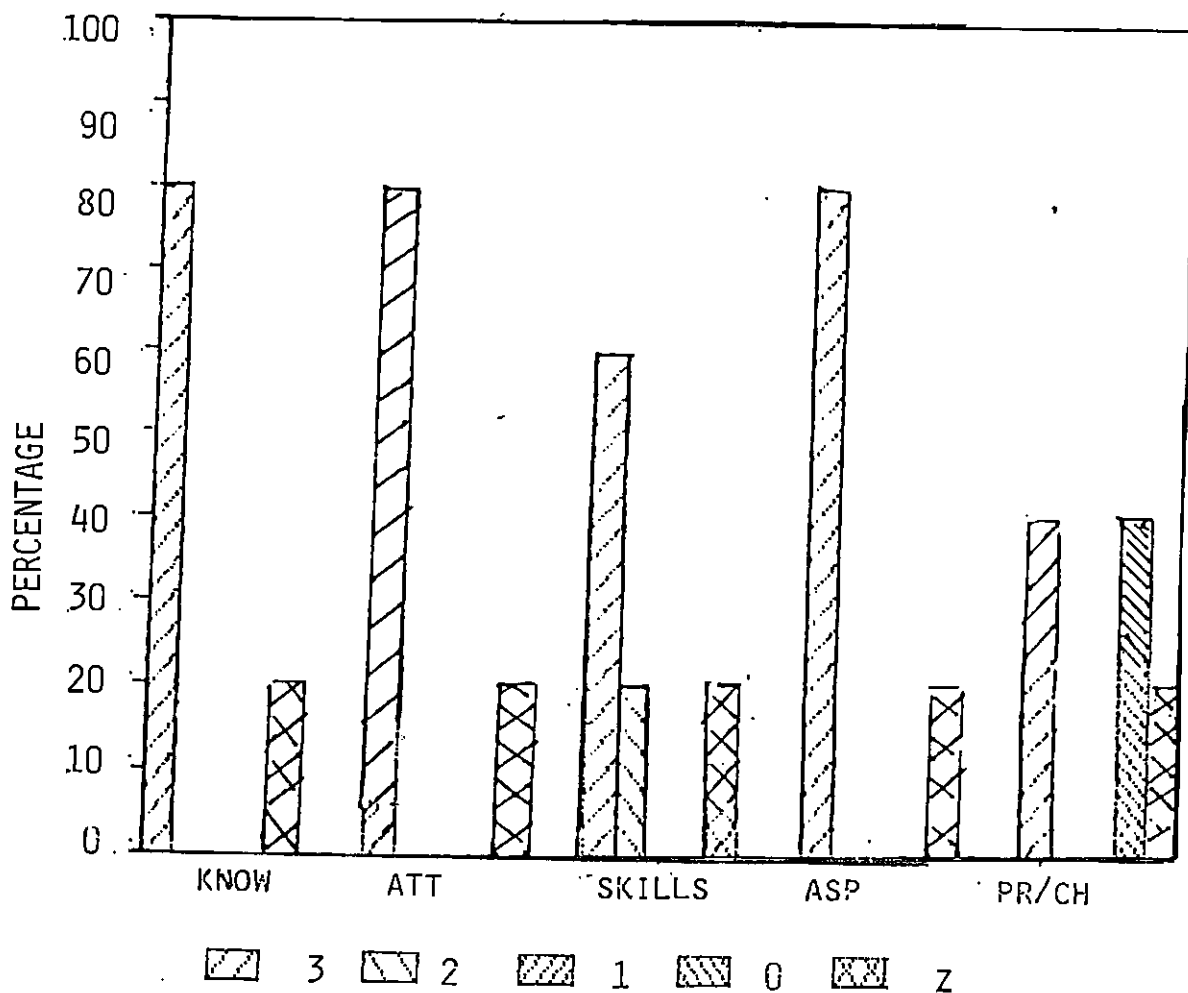
1 = TO A SLIGHT EXTENT

0 = NOT AT ALL

Z = OTHER

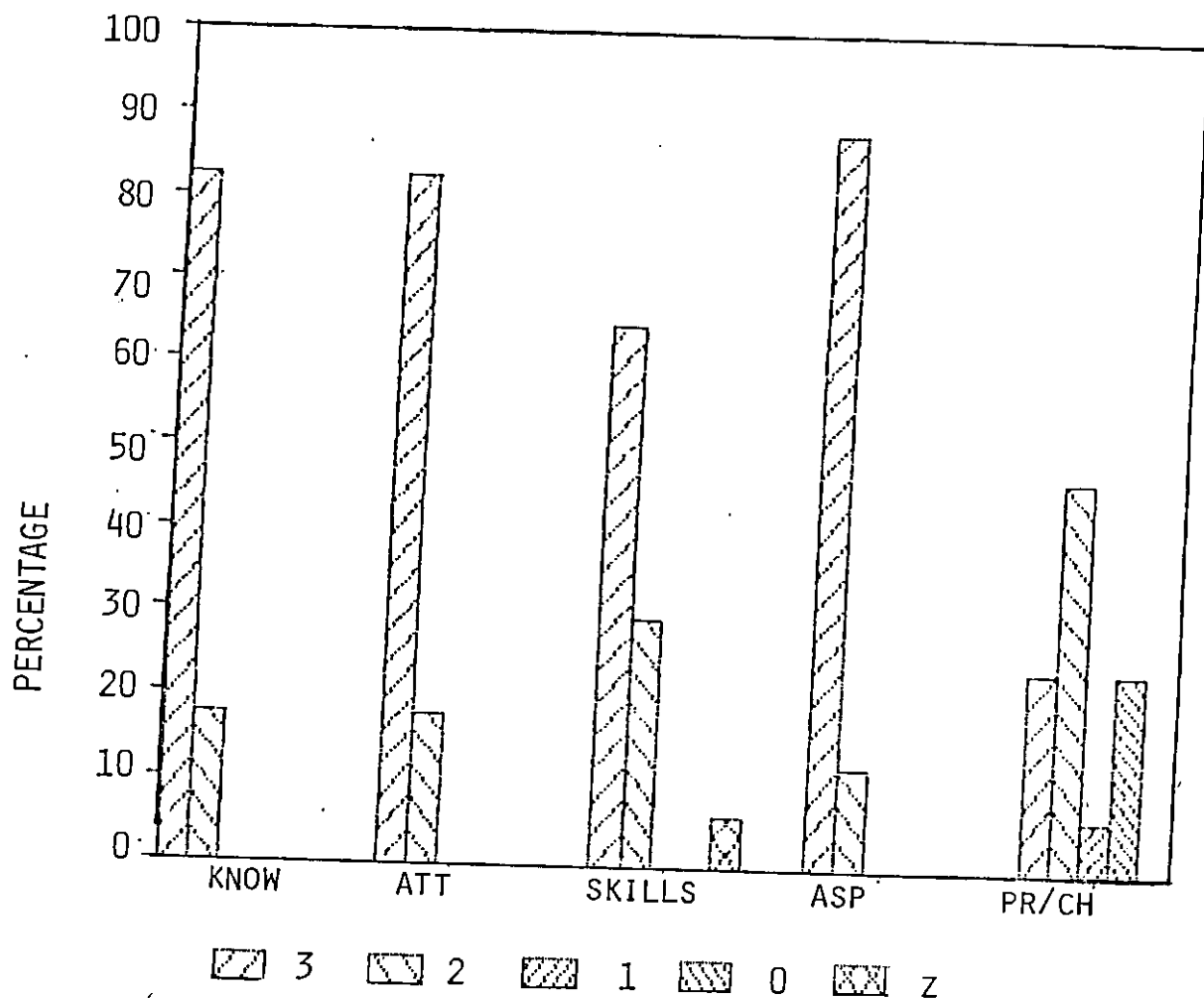
APPENDIX B.2: KASA AND PRACTICE CHANGE IN HORTICULTURE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH A (1, COURSE)
HORTICULTURE



APPENDIX B.2: KASA AND PRACTICE CHANGE IN HORTICULTURE
MANAGEMENT FOR RESPONDENTS ATTENDING IN-
CREASING NUMBERS OF EXTENSION EDUCATION
COURSES, LESOTHO, 1985

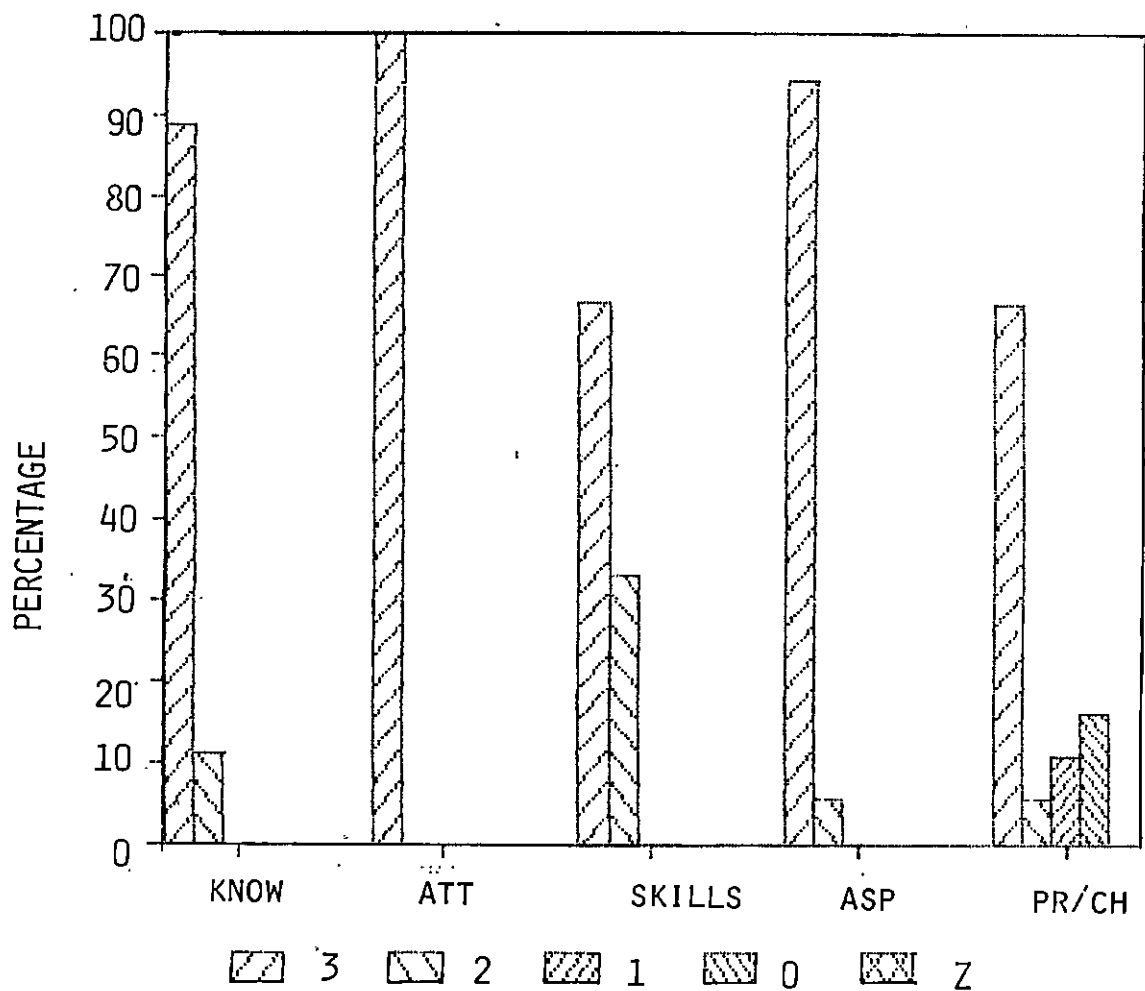
GRAPH B (2 COURSES)
HORTICULTURE



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

APPENDIX B.2: KASA AND PRACTICE CHANGE IN HORTICULTURE
MANAGEMENT FOR RESPONDENTS ATTENDING IN-
CREASING NUMBERS OF EXTENSION EDUCATION
COURSES, LESOTHO, 1985

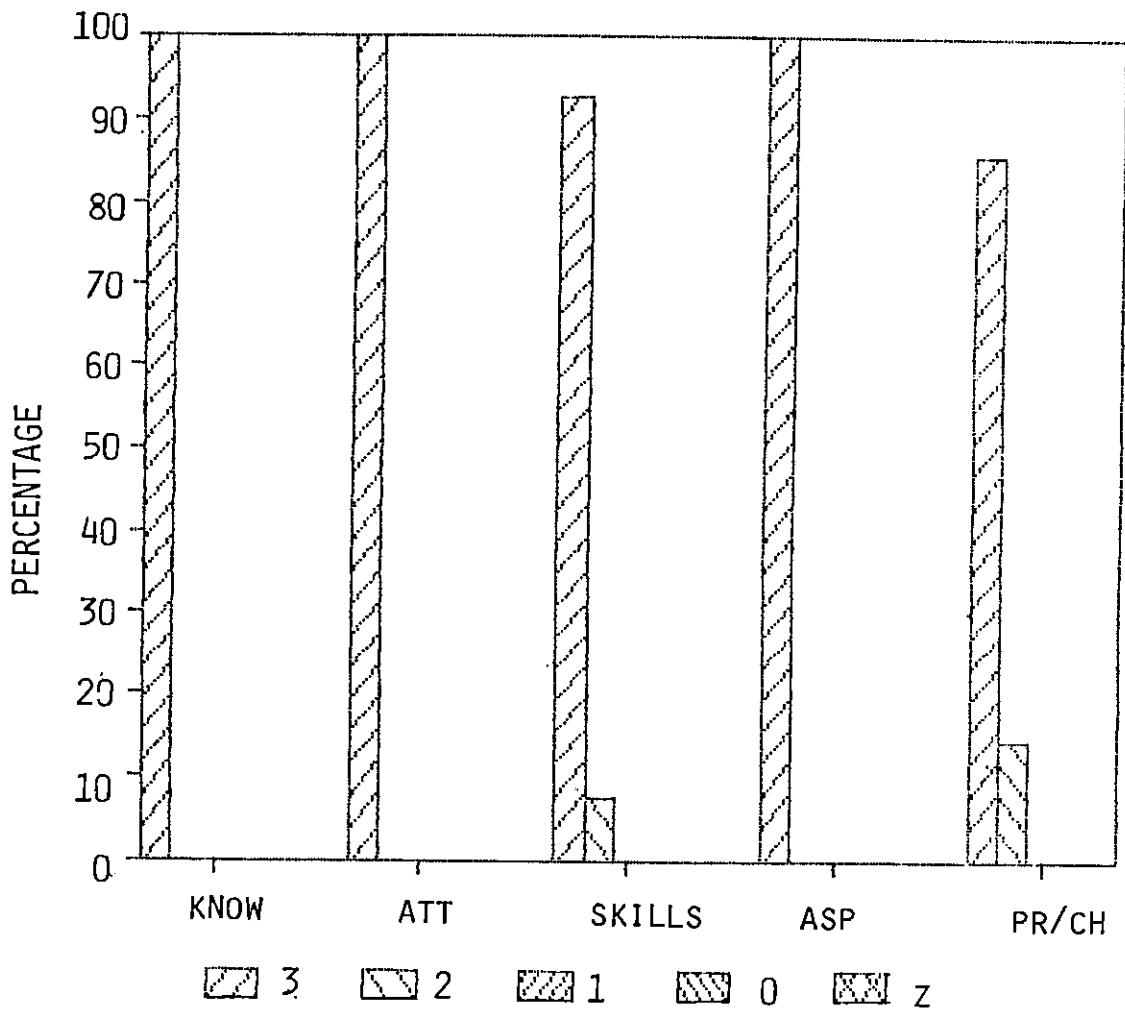
GRAPH C (3 COURSES)
HORTICULTURE



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

APPENDIX B.2: KASA AND PRACTICE CHANGE IN HORTICULTURE
MANAGEMENT FOR RESPONDENTS ATTENDING IN-
CREASING NUMBERS OF EXTENSION EDUCATION
COURSES, LESOTHO, 1985.

GRAPH D (4 COURSES)
HORTICULTURE



3 = TO A GREAT EXTENT

2 = TO A FAIR EXTENT

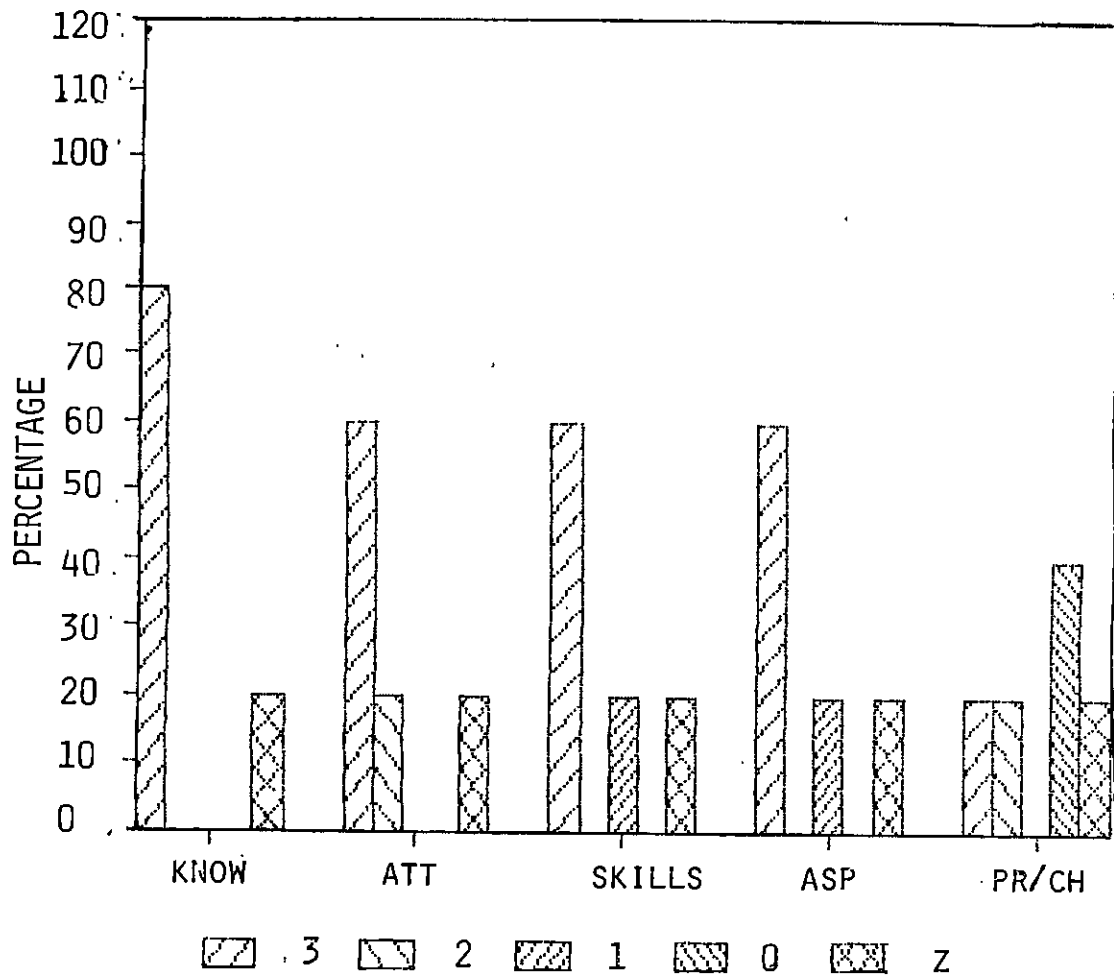
1 = TO A SLIGHT EXTENT

0 = NOT AT ALL

Z = OTHER

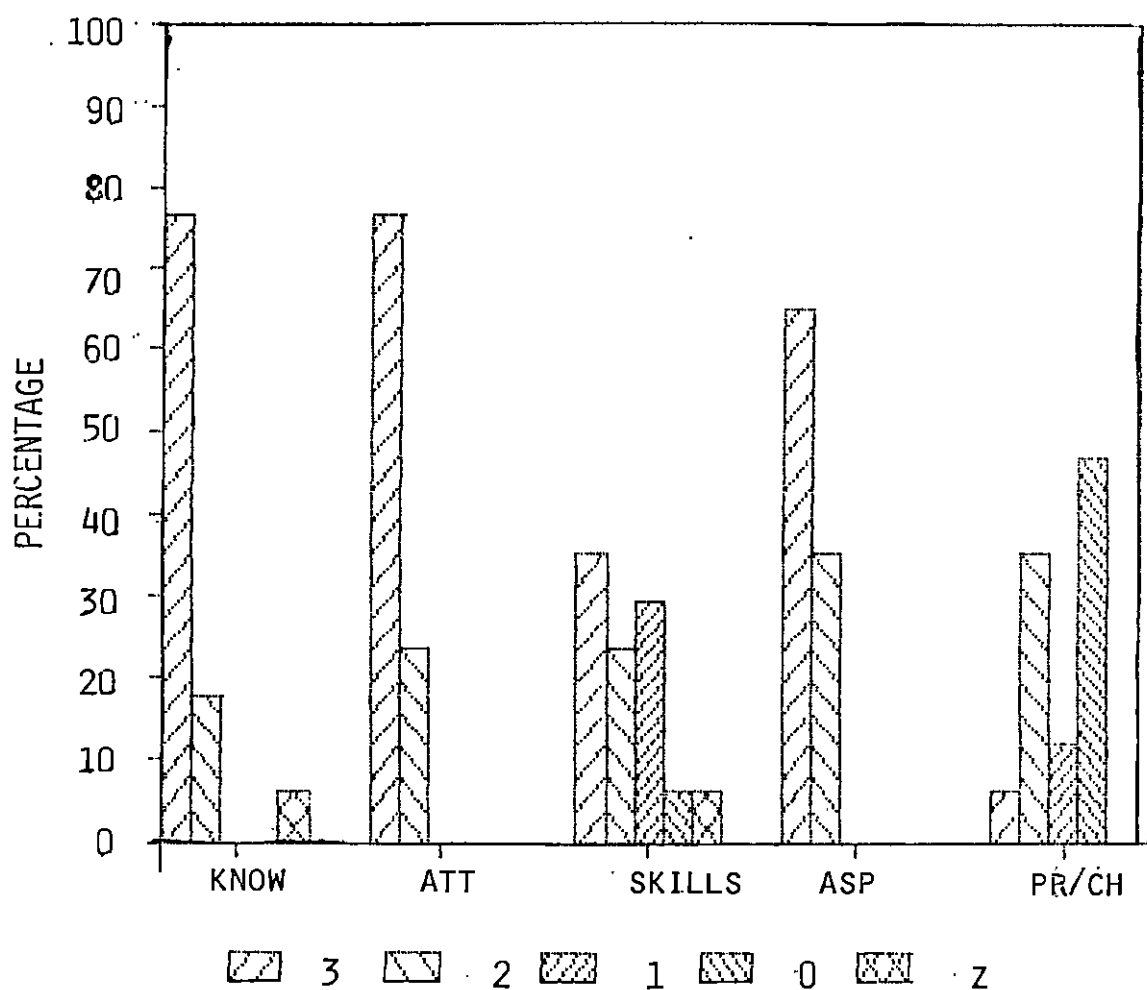
APPENDIX B.3: KASA AND PRACTICE CHANGE IN PLANT PROTECTION
FOR RESPONDENTS ATTENDING INCREASING NUMBERS
OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH A (1 COURSE)
PLANT PROTECTION



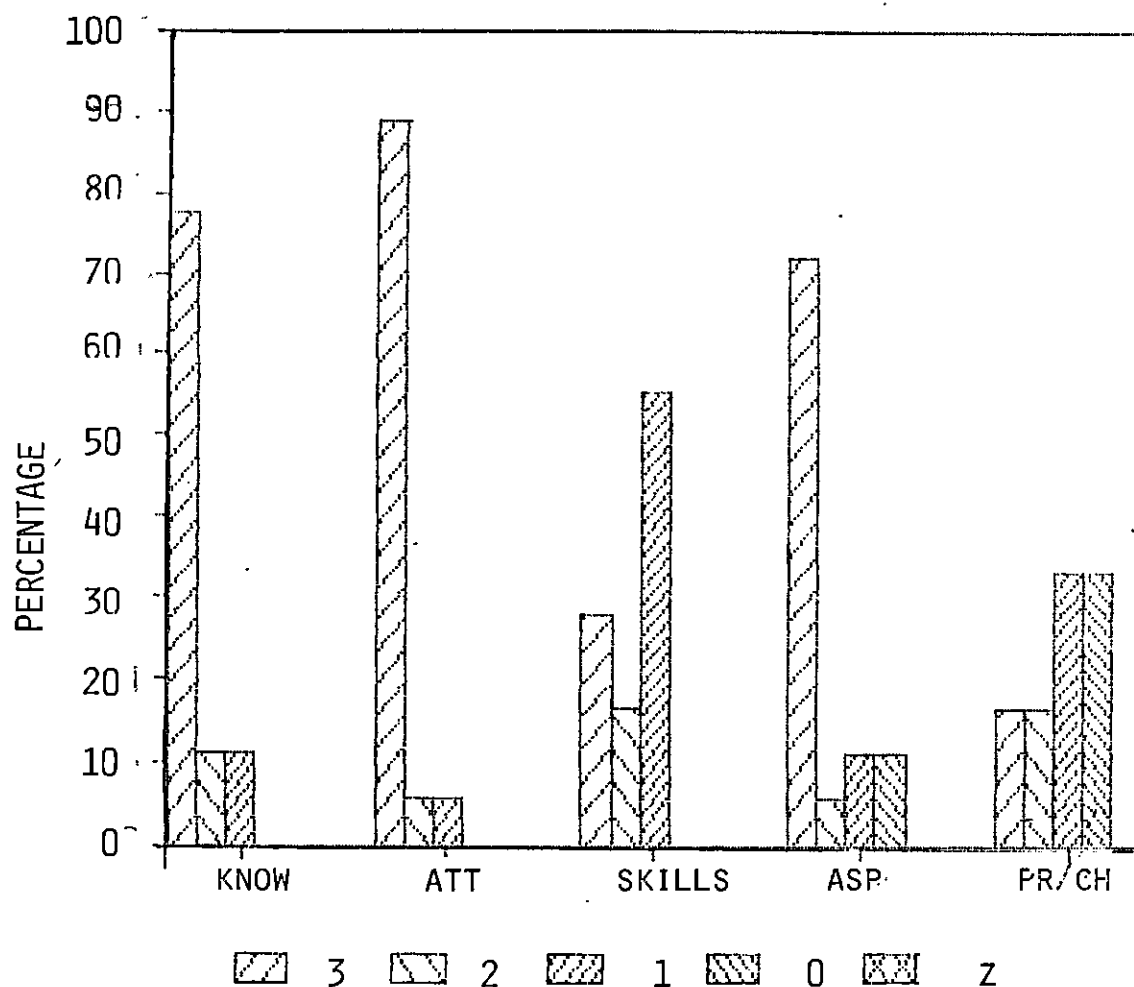
APPENDIX B.3: KASA AND PRACTICE CHANGE IN PLANT PROTECTION
FOR RESPONDENTS ATTENDING INCREASING NUMBERS
OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH B (2 COURSES)
PLANT PROTECTION



APPENDIX B.3: KASA AND PRACTICE CHANGE IN PLANT PROTECTION
FOR RESPONDENTS ATTENDING INCREASING NUMBERS
OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

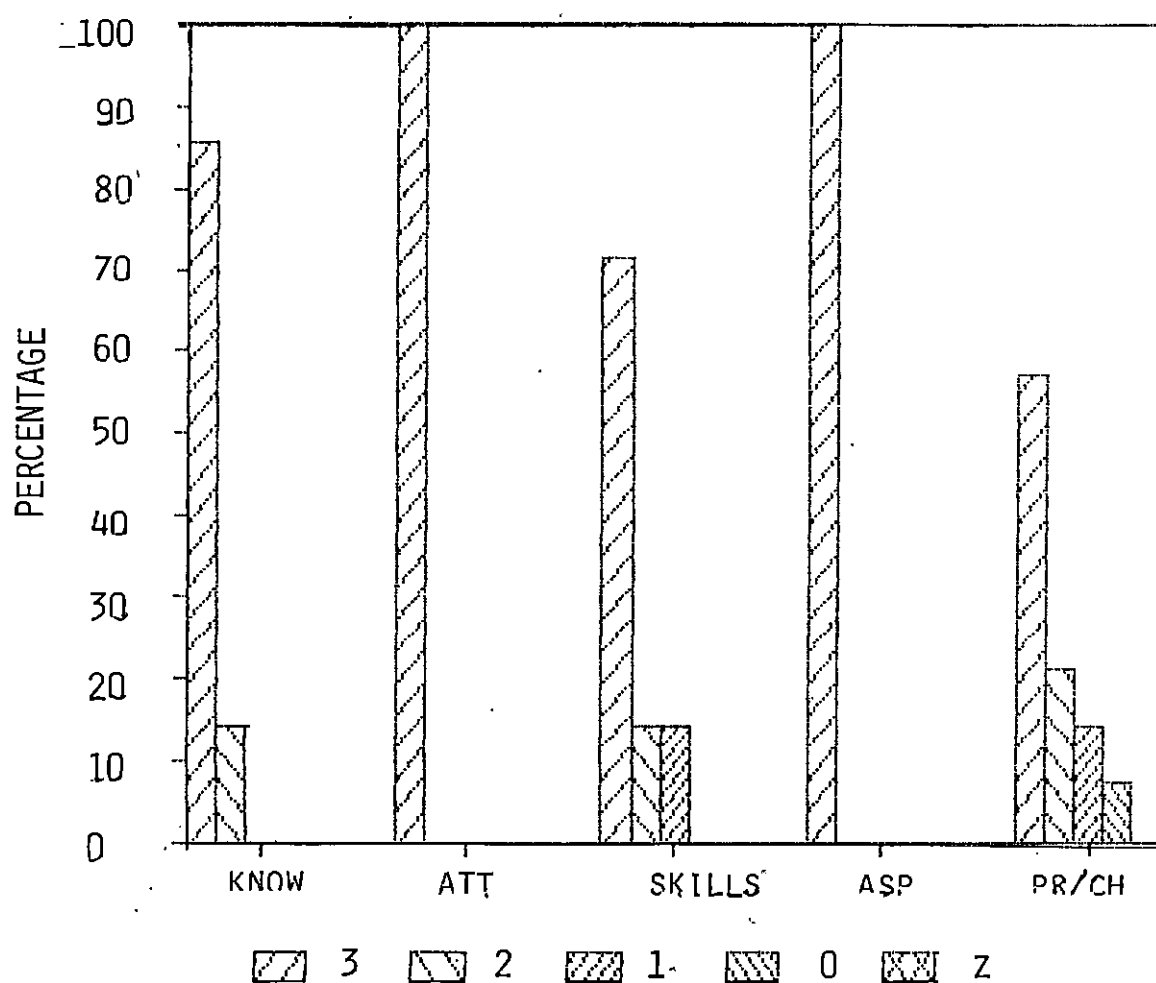
GRAPH C (3 COURSES) .
PLANT PROTECTION



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

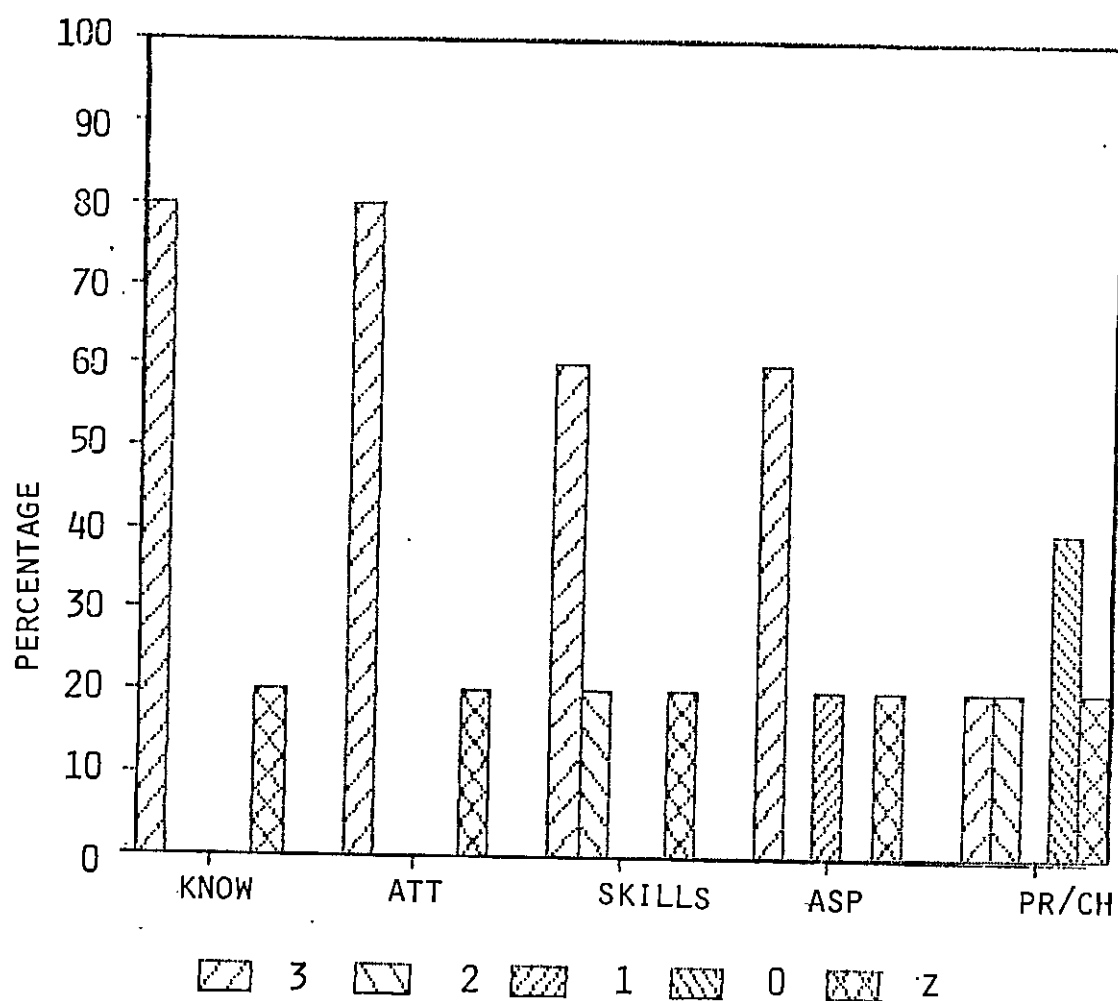
APPENDIX B.3: KASA AND PRACTICE CHANGE IN PLANT PROTECTION
FOR RESPONDENTS ATTENDING INCREASING NUMBERS
OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH D (4 COURSES)
PLANT PROTECTION



APPENDIX B.4: KASA AND PRACTICE CHANGE IN FARM MACHINERY
FOR RESPONDENTS ATTENDING INCREASING NUM-
BERS OF EXTENSION EDUCATION COURSES,
LESOTHO, 1985.

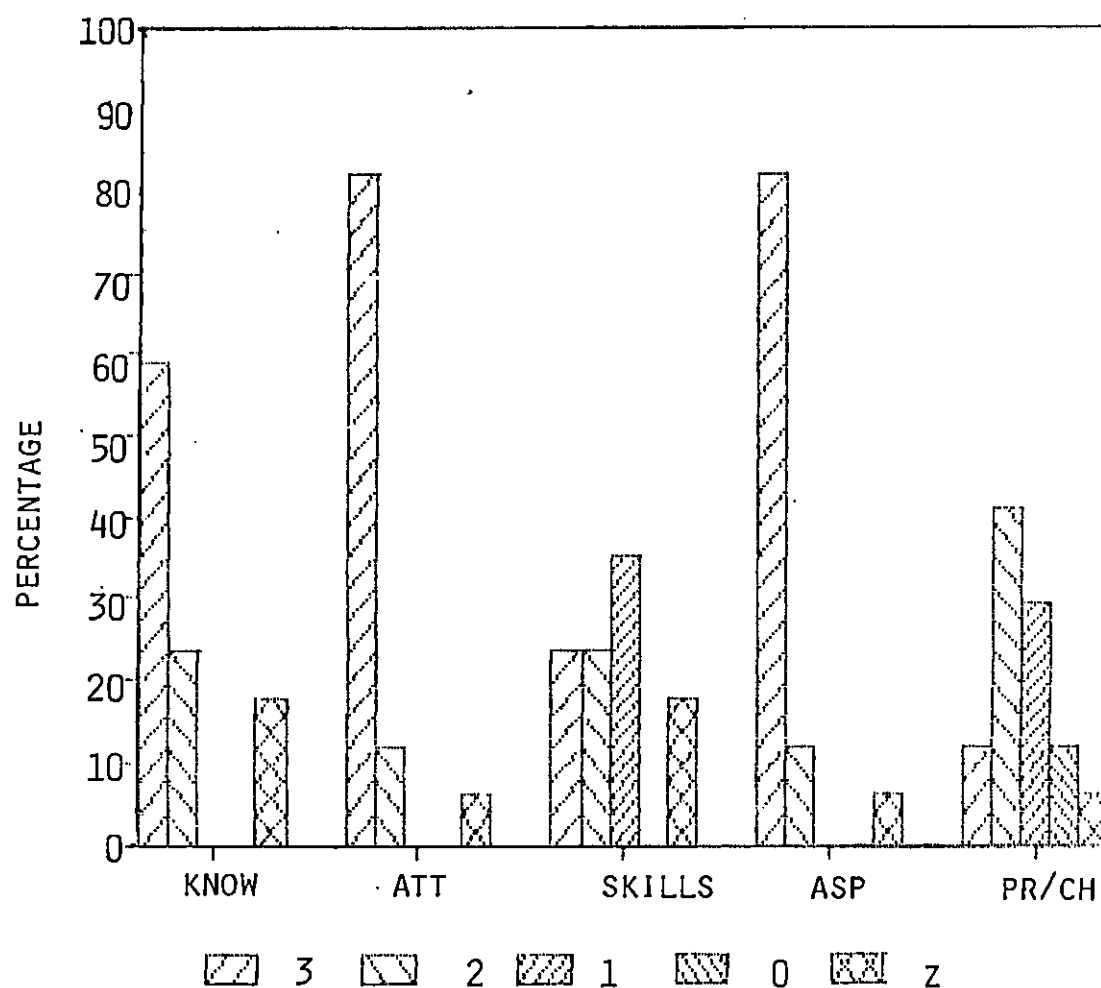
GRAPH A (1 COURSE)
FARM MACHINERY



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

APPENDIX B.4: KASA AND PRACTICE CHANGE IN FARM MACHINERY
FOR RESPONDENTS ATTENDING INCREASING NUM-
BERS OF EXTENSION EDUCATION COURSES,
LESOTHO, 1985.

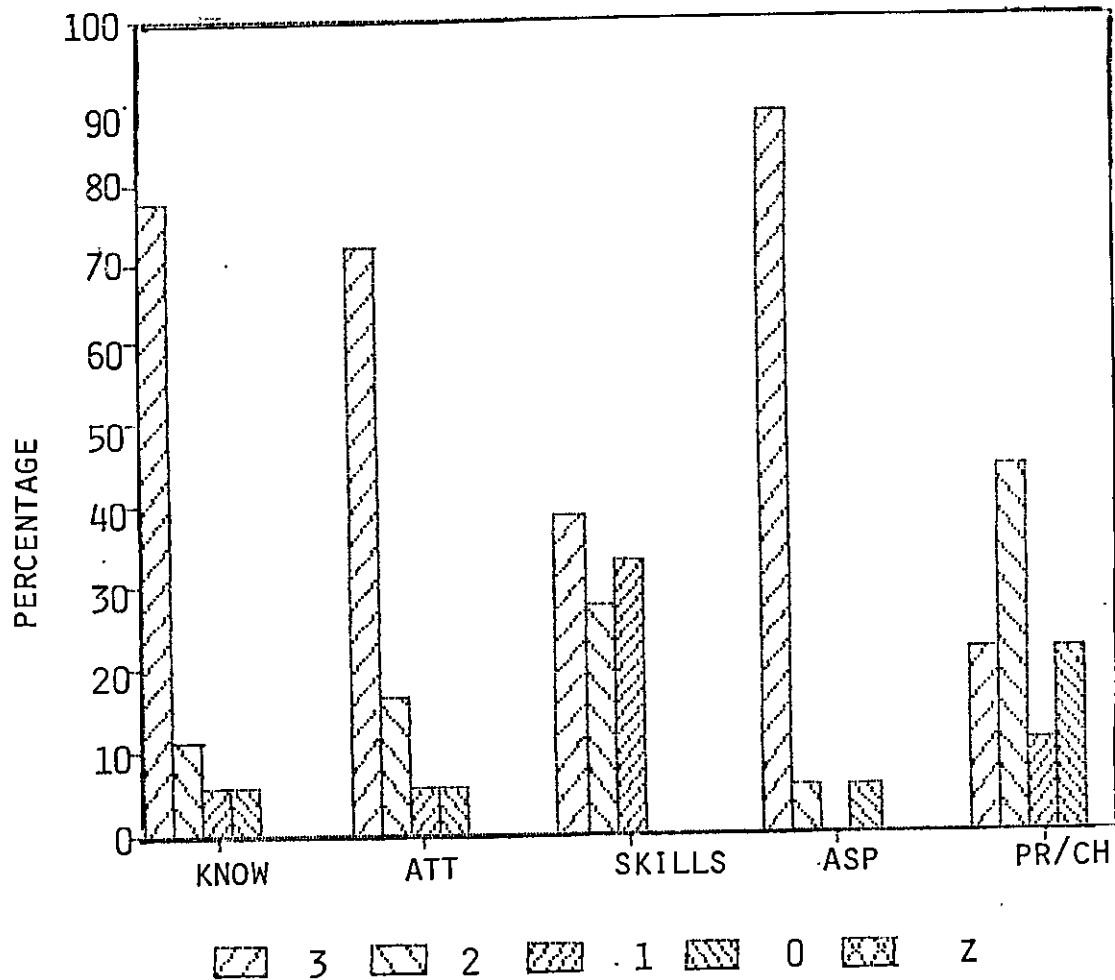
GRAPH B (2 COURSES)
FARM MACHINERY



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

APPENDIX B.4: KASA AND PRACTICE CHANGE IN FARM MACHINERY
FOR RESPONDENTS ATTENDING INCREASING NUM-
BERS OF EXTENSION EDUCATION COURSES,
LESOTHO, 1985.

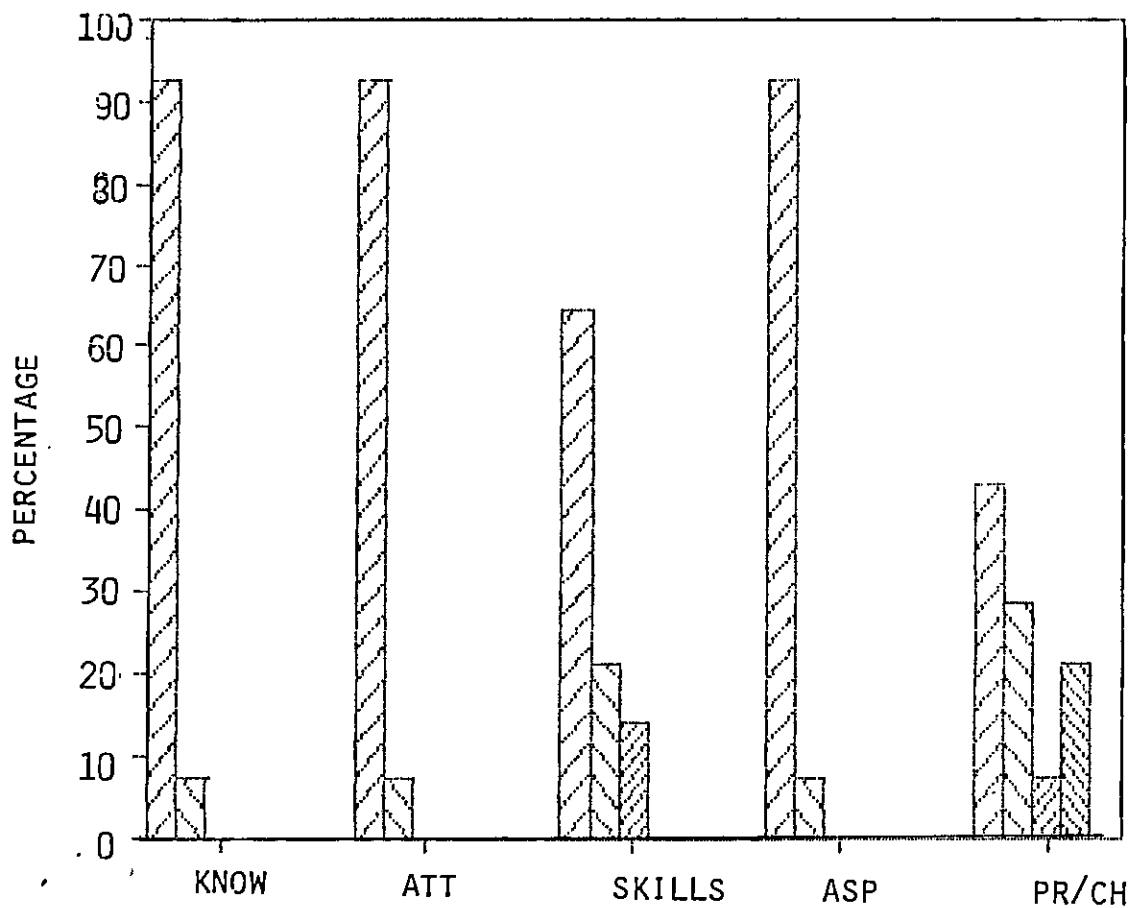
GRAPH C (3 COURSES)
FARM MACHINERY



3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

APPENDIX B.4: KASA AND PRACTICE CHANGE IN FARM MACHINERY
FOR RESPONDENTS ATTENDING INCREASING NUM-
BERS OF EXTENSION EDUCATION COURSES.
LESOTHO, 1985.

GRAPH D (4 COURES)
FARM MACHINERY

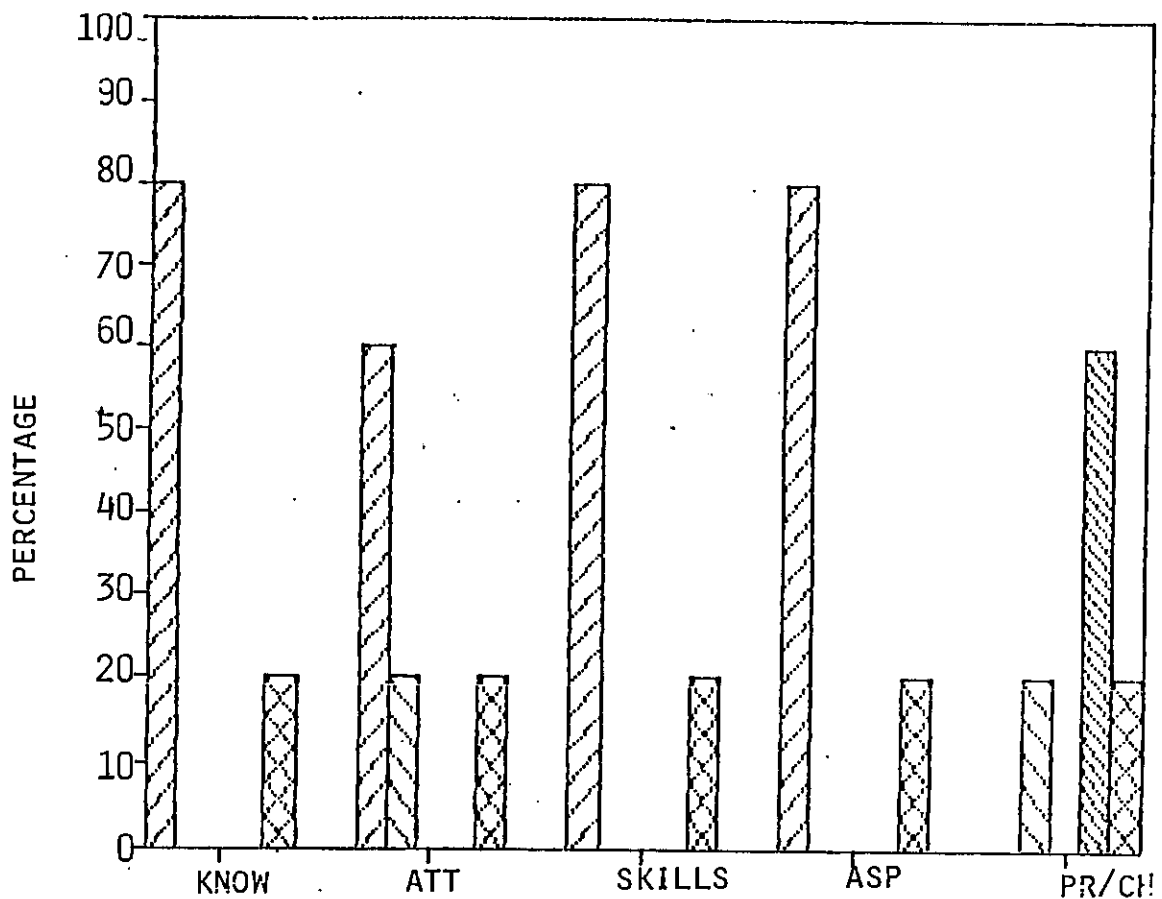


3 2 1 0 Z

3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

APPENDIX B.5: KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985

GRAPH A (1 COURSE)
ANIMAL AND RANGE MANAGEMENT

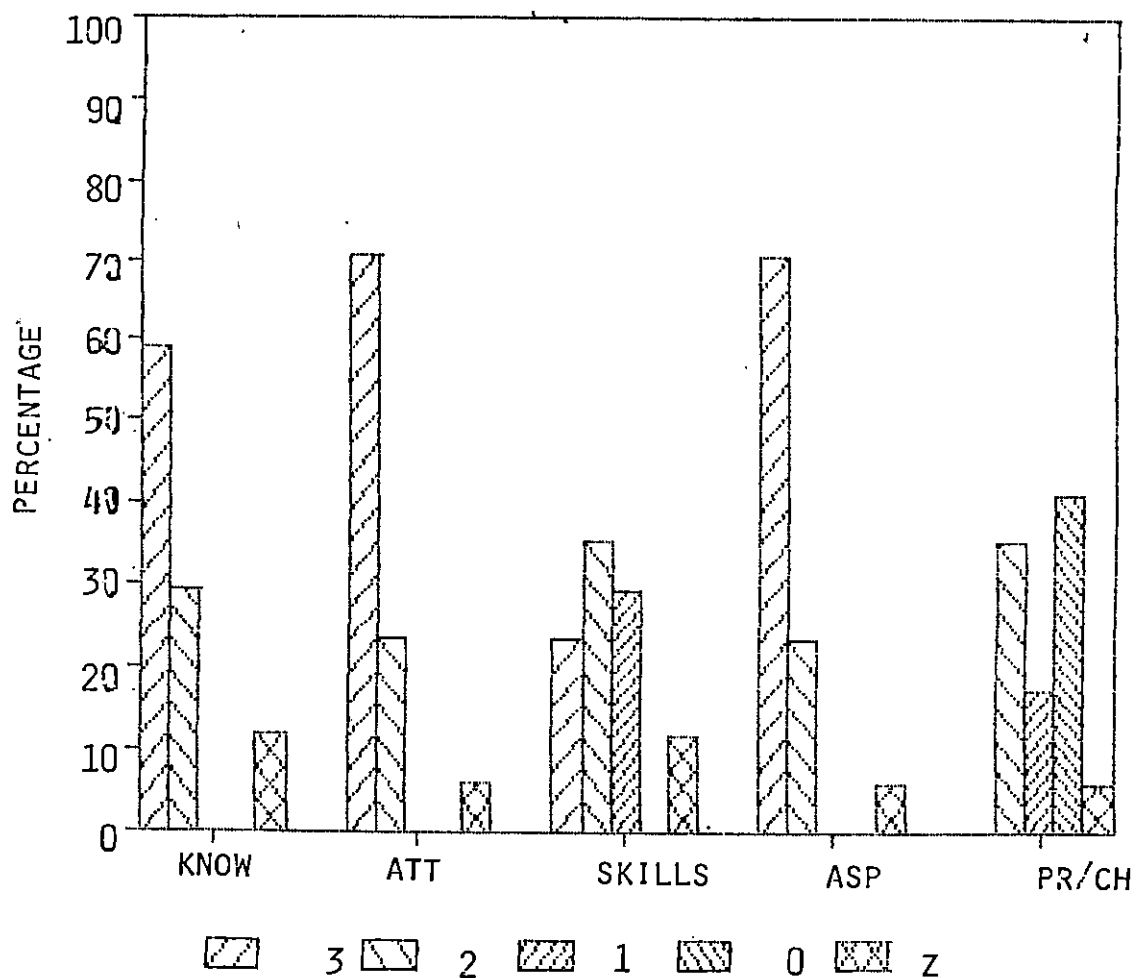


3 2 1 0 Z

3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

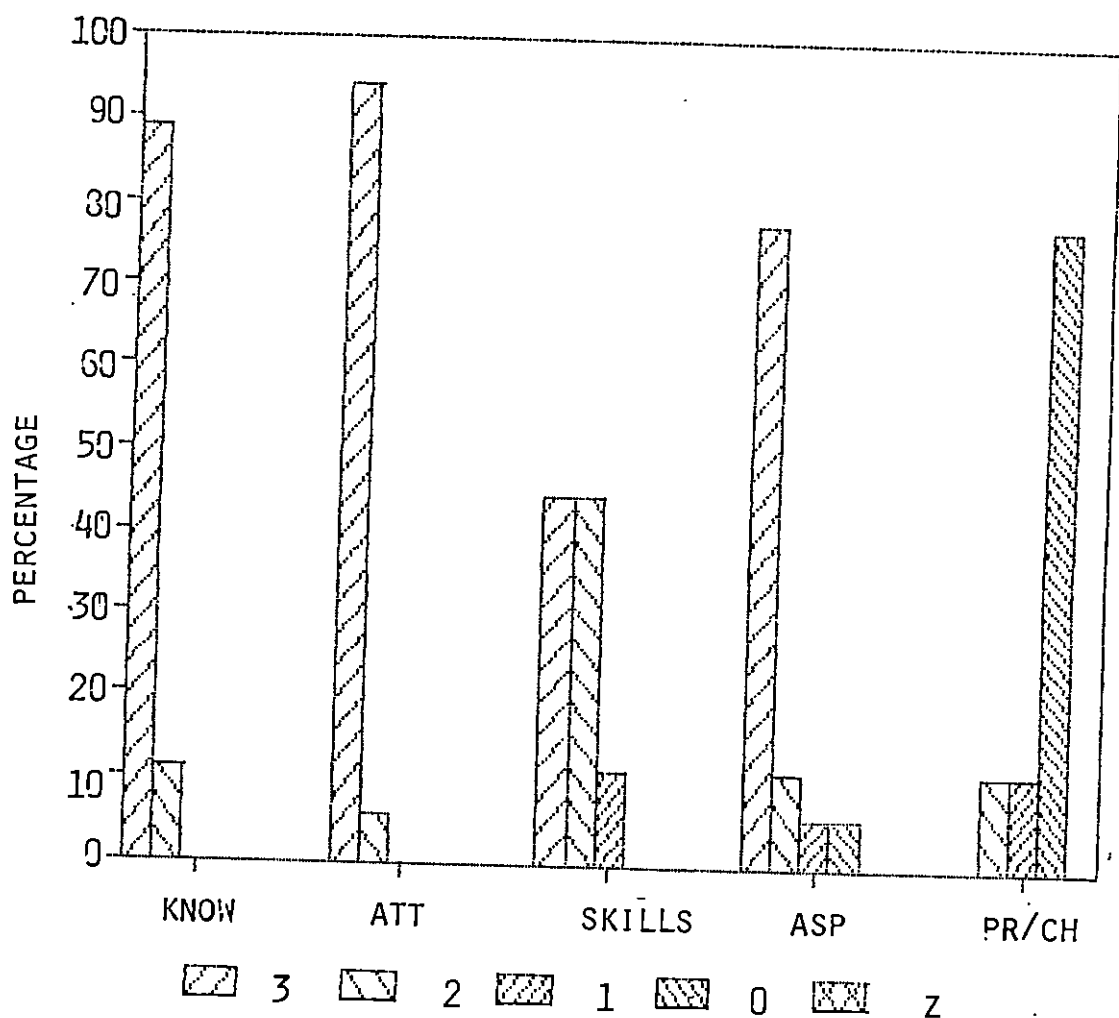
APPENDIX B.5: KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH B (2 COURSES)
ANIMAL AND RANGE MANAGEMENT



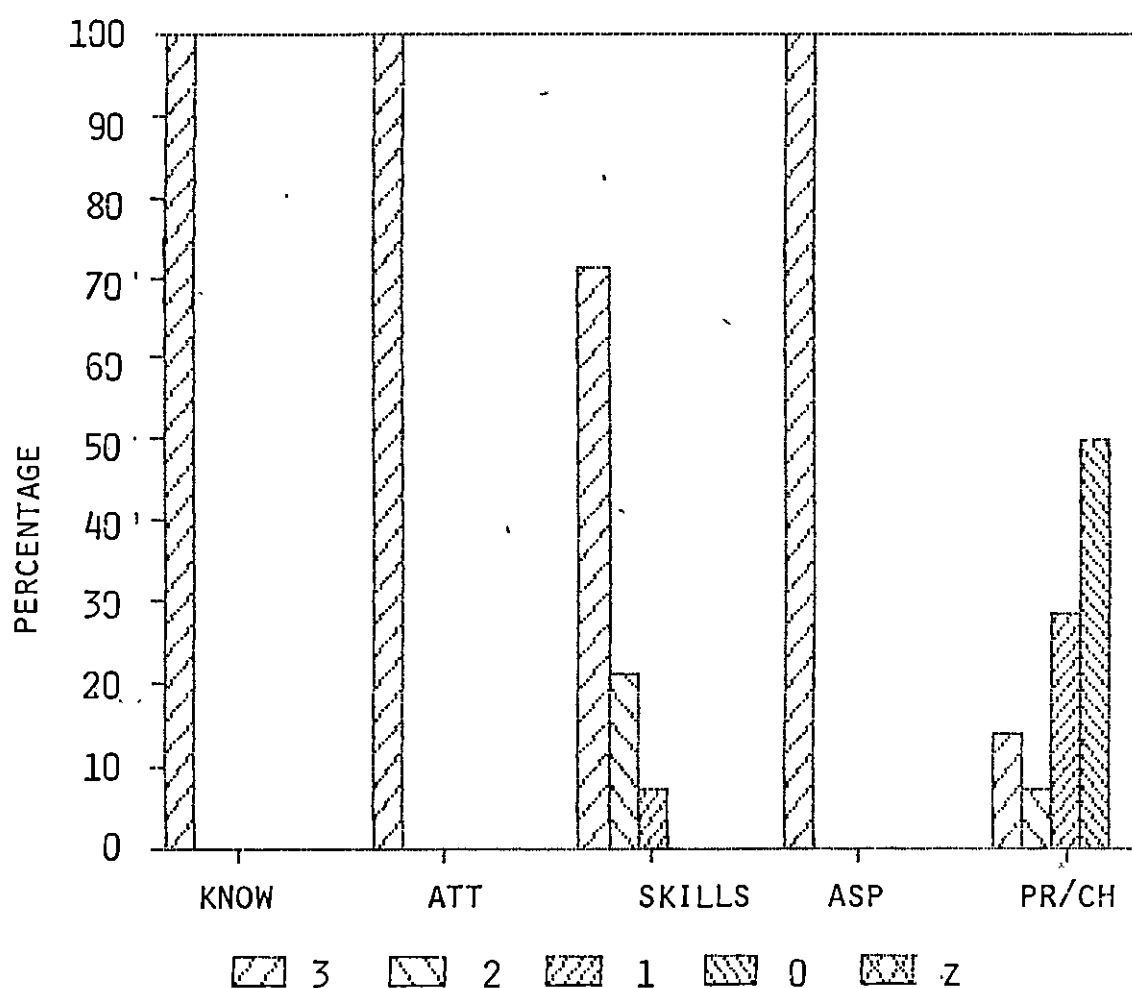
APPENDIX B.5: KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH C (3 COURSES)
ANIMAL AND RANGE MANAGEMENT



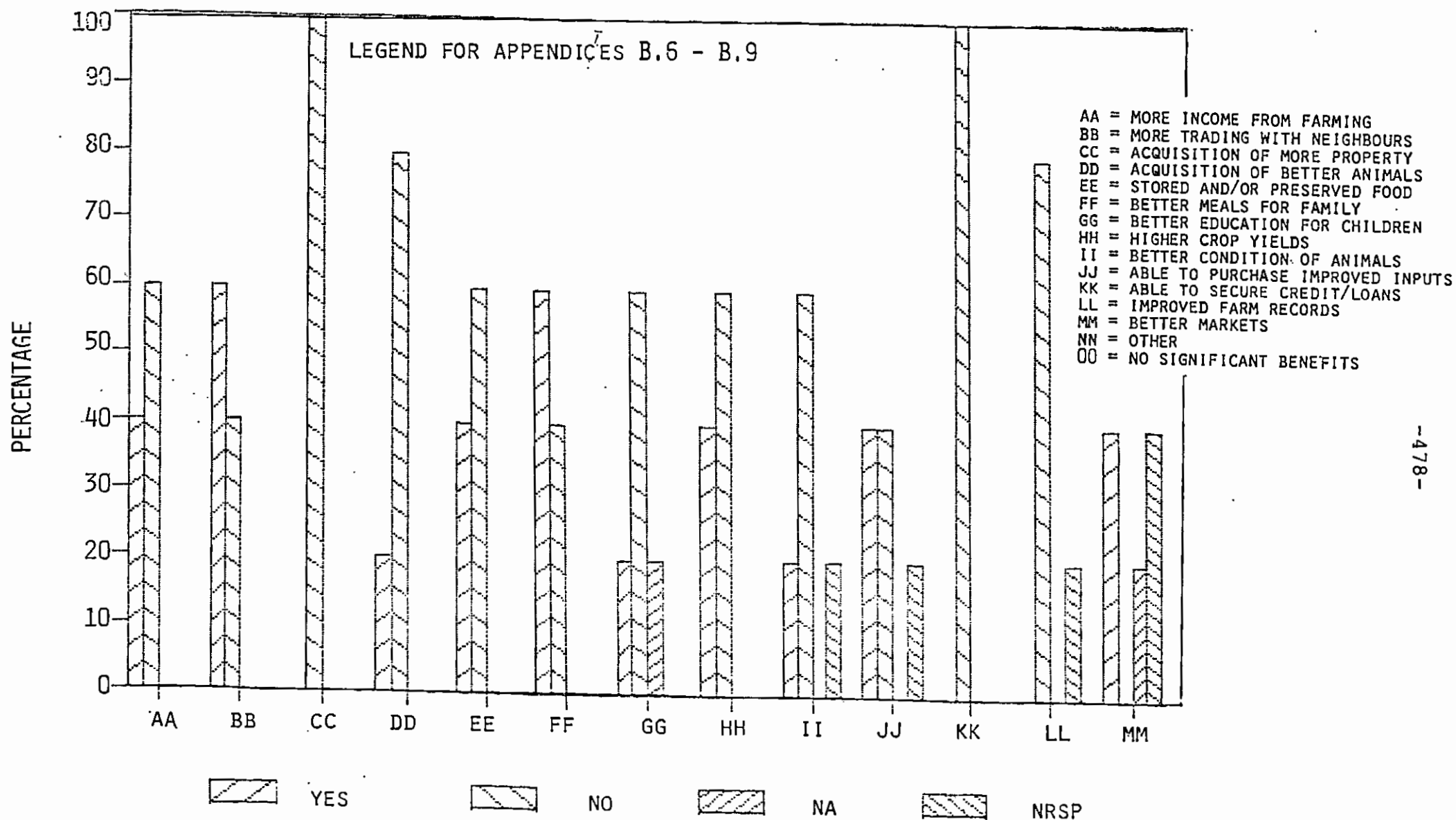
APPENDIX B.5: KASA AND PRACTICE CHANGE IN ANIMAL AND RANGE MANAGEMENT FOR RESPONDENTS ATTENDING INCREASING NUMBERS OF EXTENSION EDUCATION COURSES, LESOTHO, 1985.

GRAPH D (4 COURSES)
ANIMAL AND RANGE MANAGEMENT

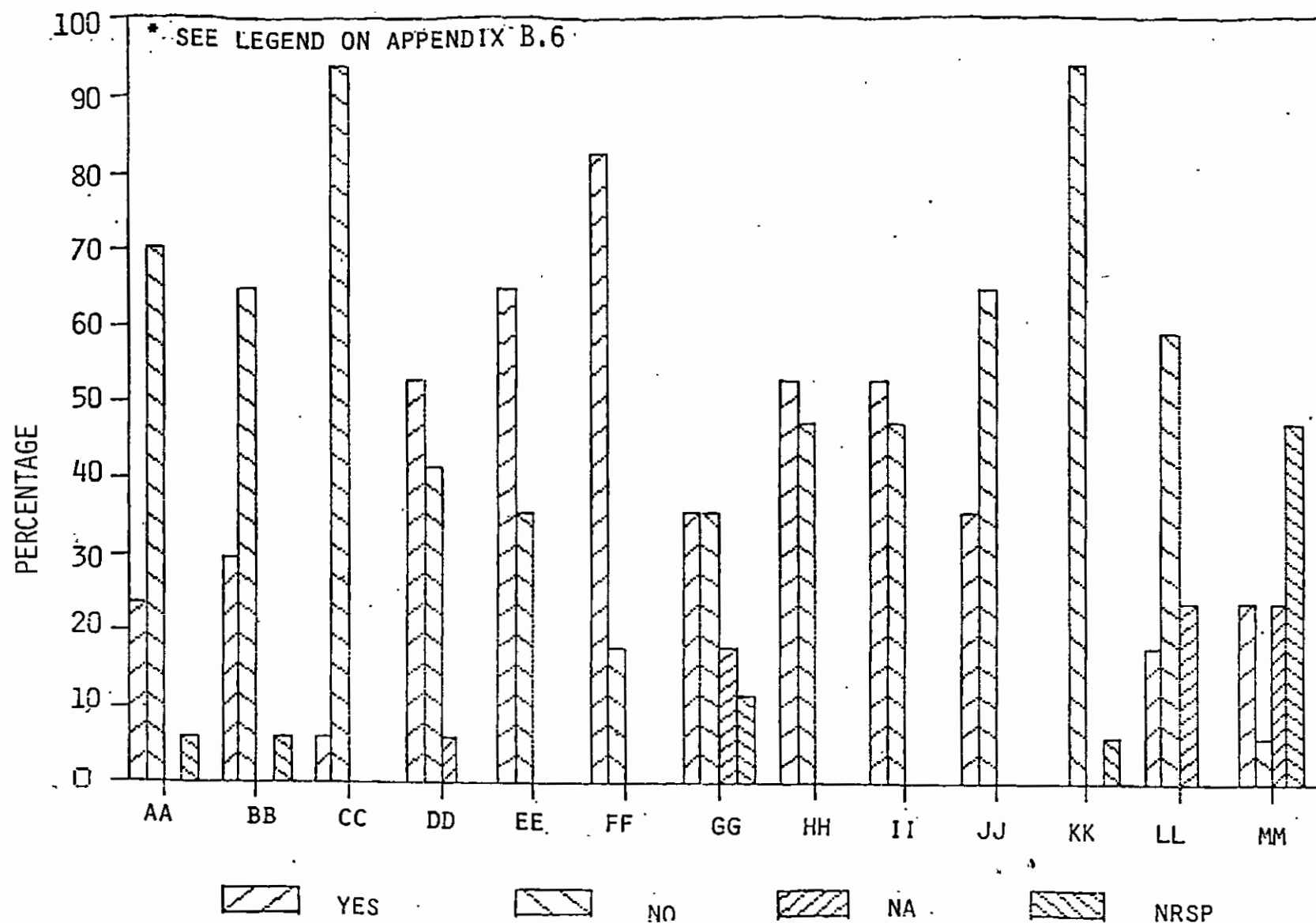


3 = TO A GREAT EXTENT
2 = TO A FAIR EXTENT
1 = TO A SLIGHT EXTENT
0 = NOT AT ALL
Z = OTHER

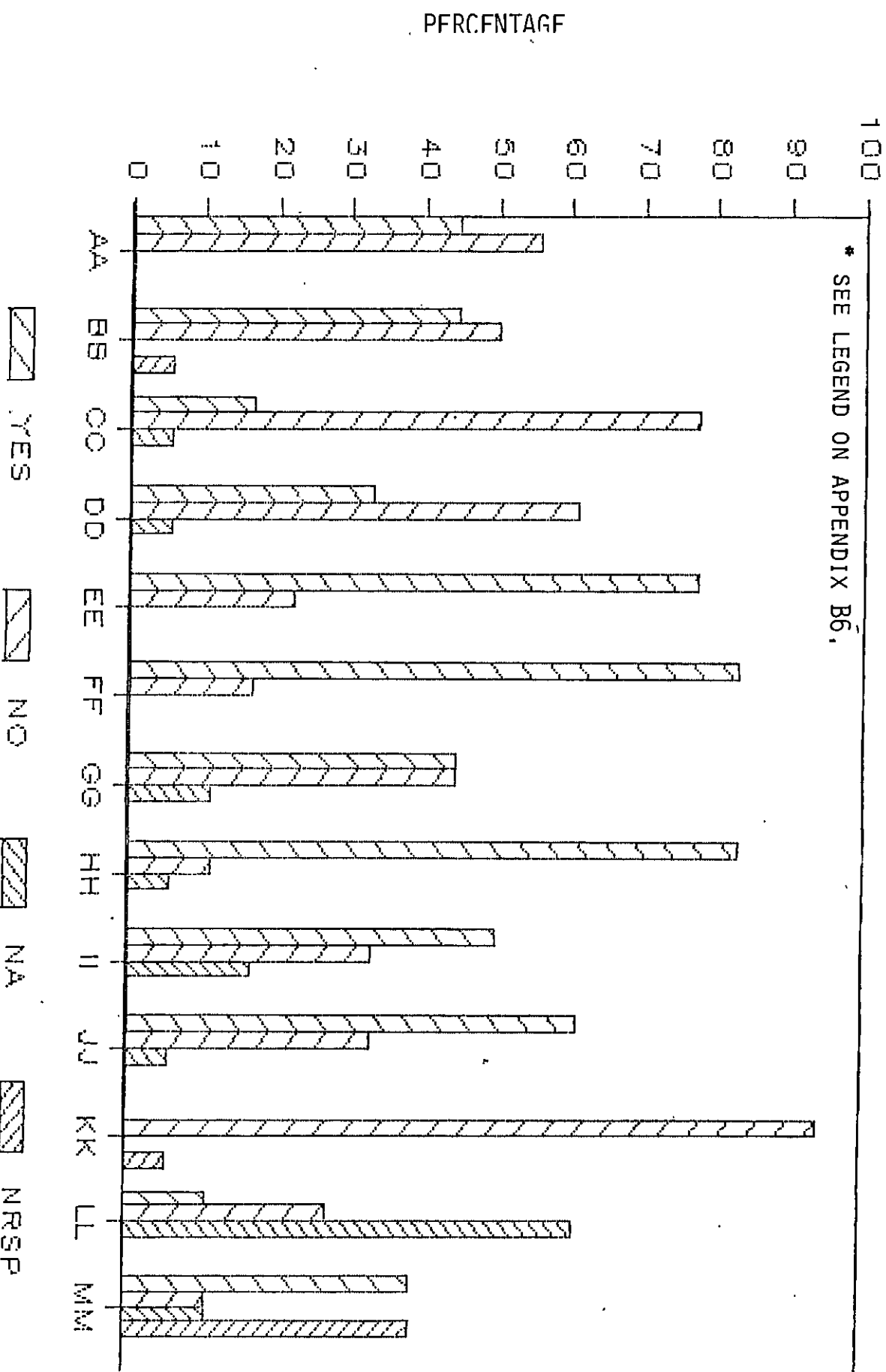
APPENDIX B.6: BENEFITS ACCRUING TO RESPONDENTS ATTENDING ONE EXTENSION COURSE,
LESOTHO, 1985



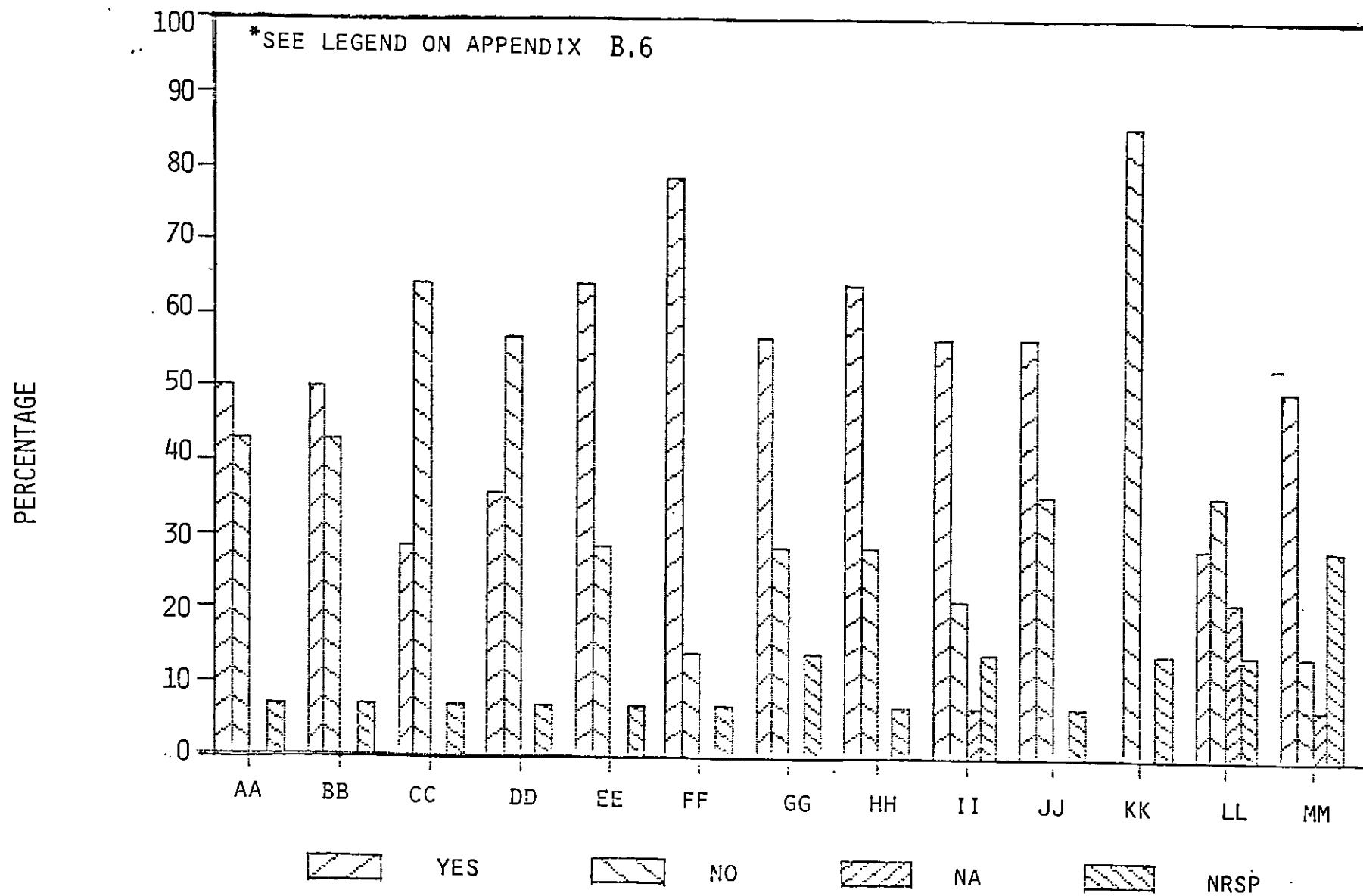
APPENDIX B.7: BENEFITS ACCRUING TO RESPONDENTS ATTENDING TWO EXTENSION COURSES,
LESOTHO, 1985.



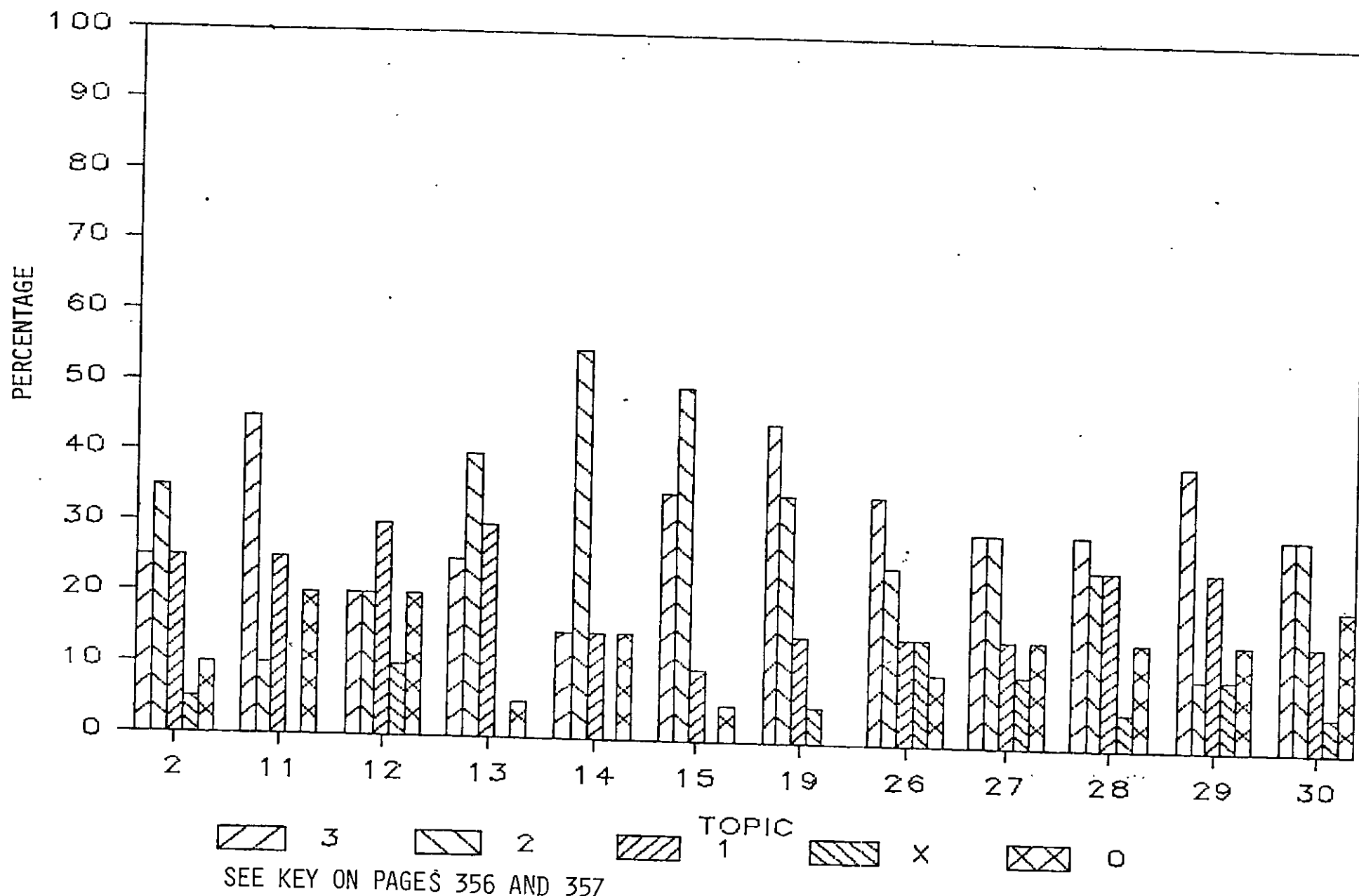
APPENDIX B.8: BENEFITS ACCRUING TO RESPONDENTS ATTENDING THREE EXTENSION COURSES, LESOTHO, 1985.



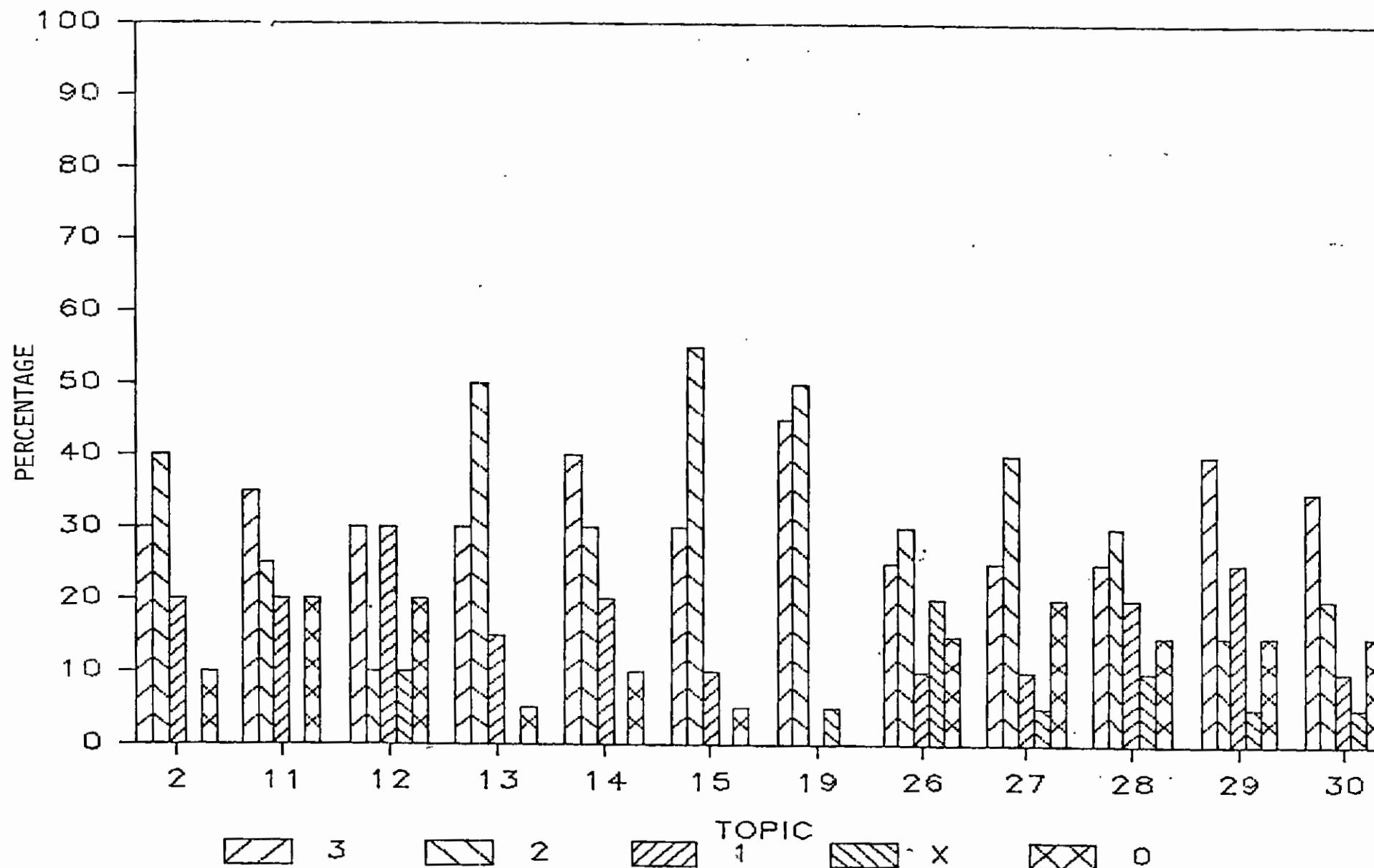
APPENDIX B.9 BENEFITS ACCRUING TO RESPONDENTS ATTENDING FOUR-EXTENSION COURSES, LESOTHO, 1985



APPENDIX B.10: KNOWLEDGE CHANGE IN AGRICULTURAL SUBJECT FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985

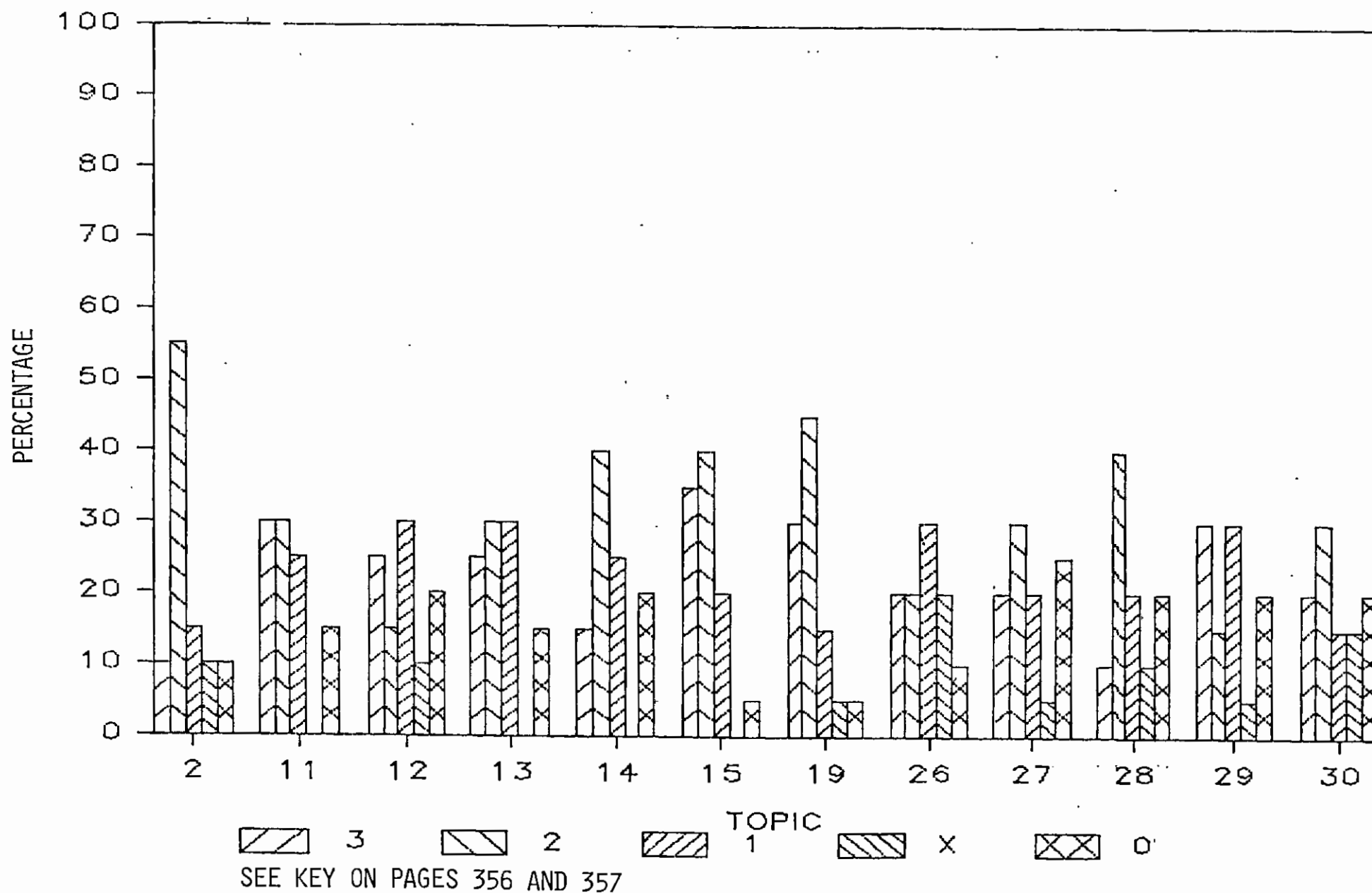


APPENDIX B.11: ATTITUDE CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985.

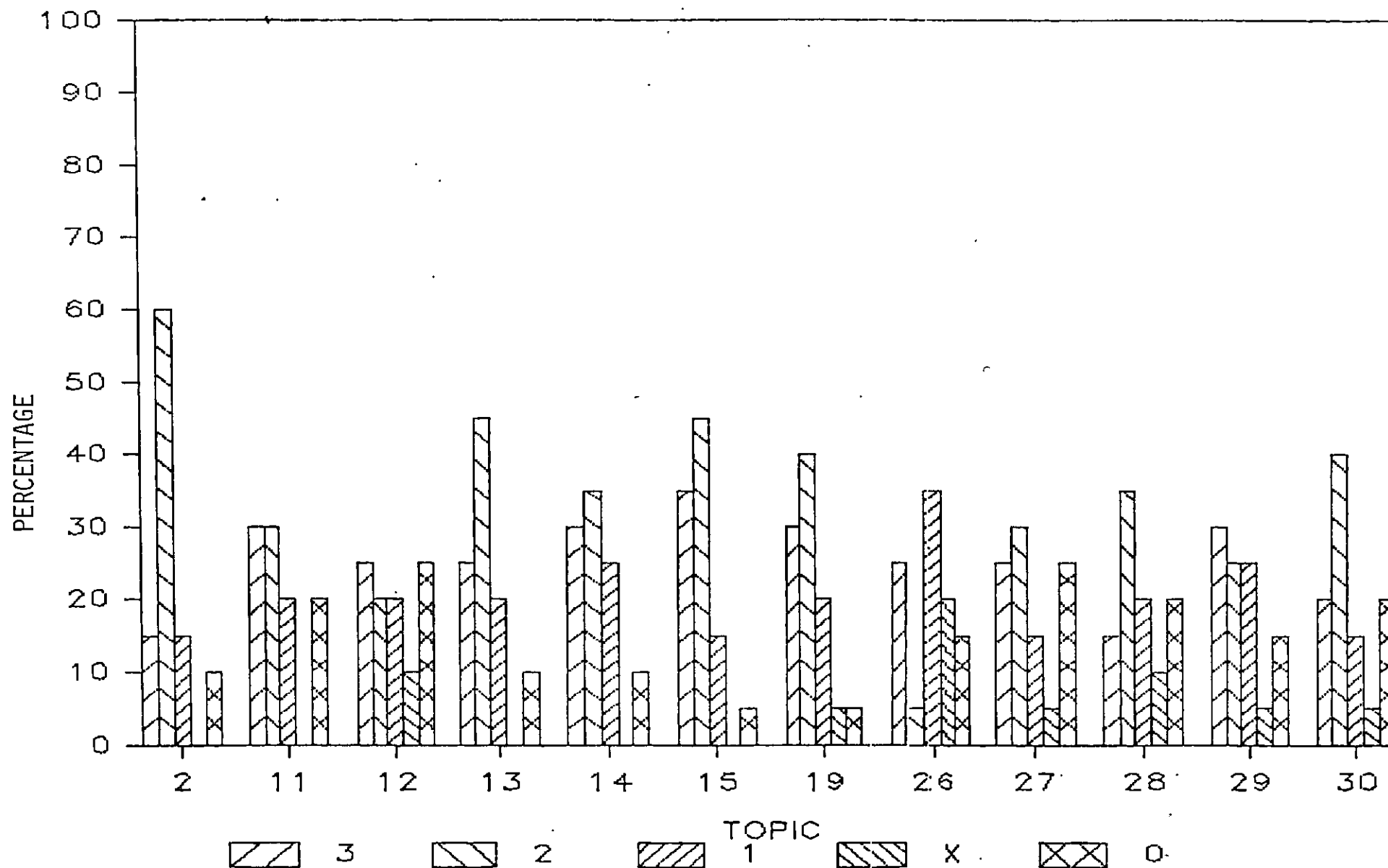


SEE KEY ON PAGES 356 AND 357

APPENDIX B.12: SKILLS CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985.

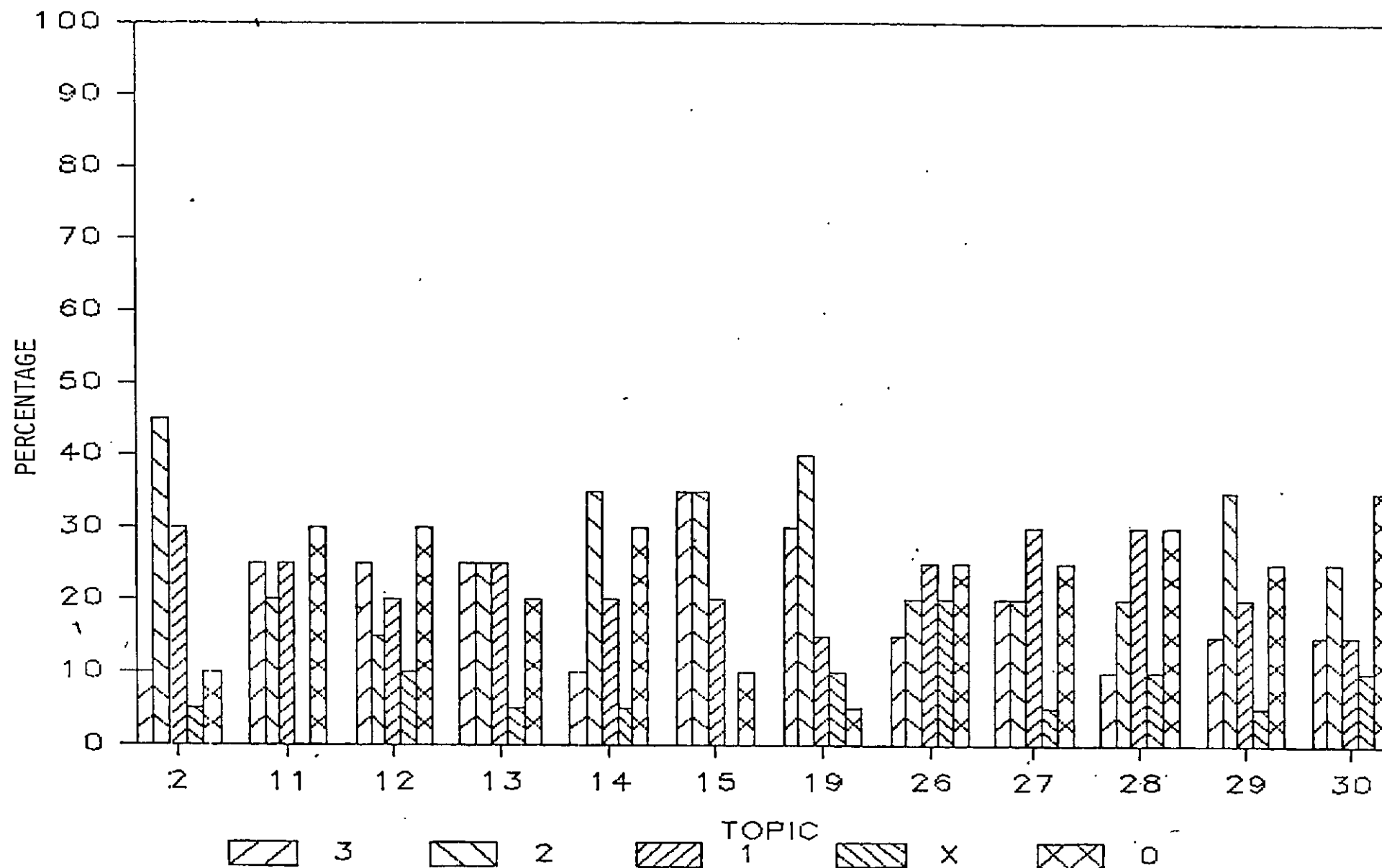


APPENDIX B.13: ASPIRATIONS CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS ON THE AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985.



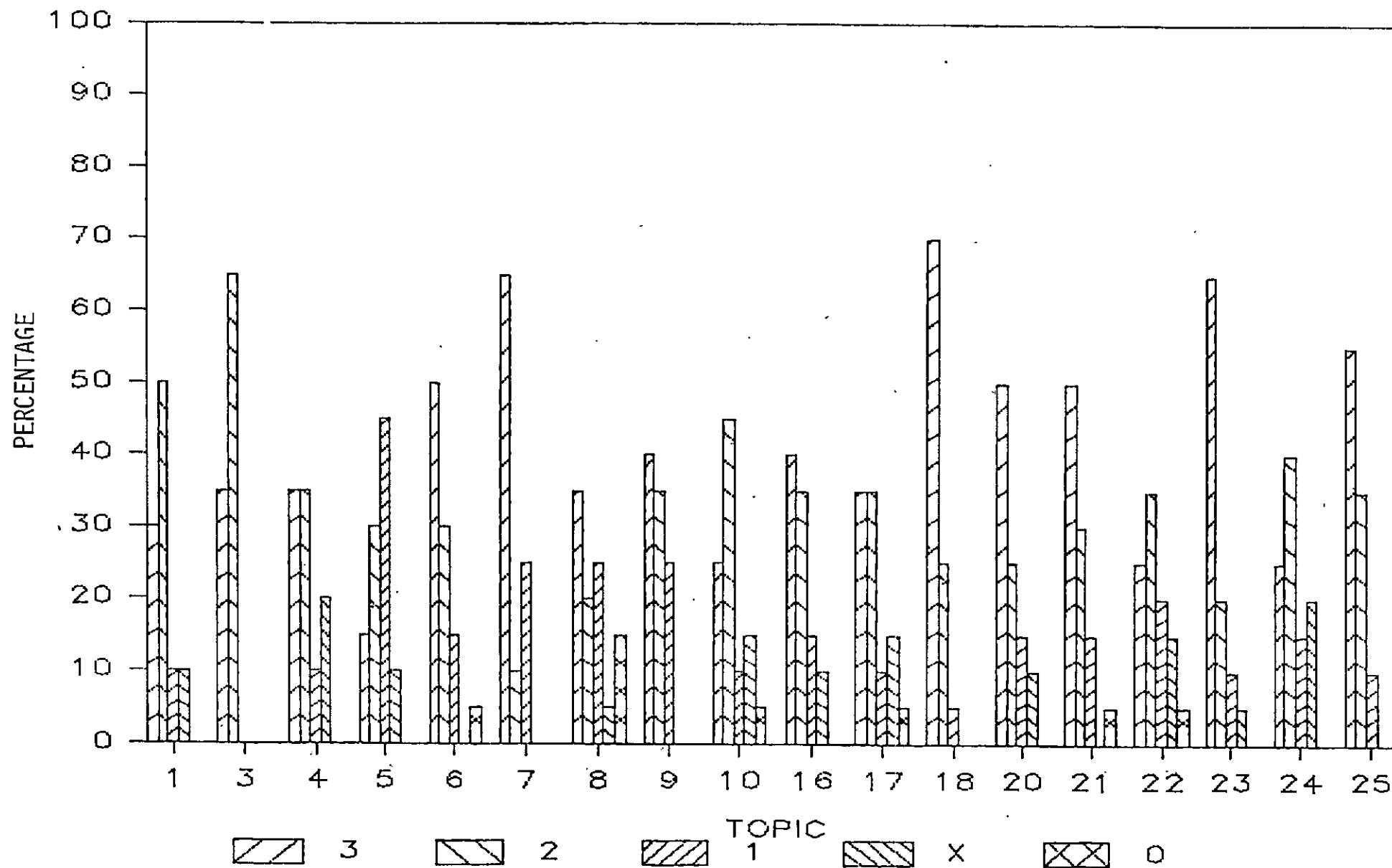
SEE KEY ON PAGES 356 AND 357

APPENDIX B.14: PRACTICE CHANGE IN AGRICULTURAL SUBJECTS FOR PARTICIPANTS IN THE AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985.



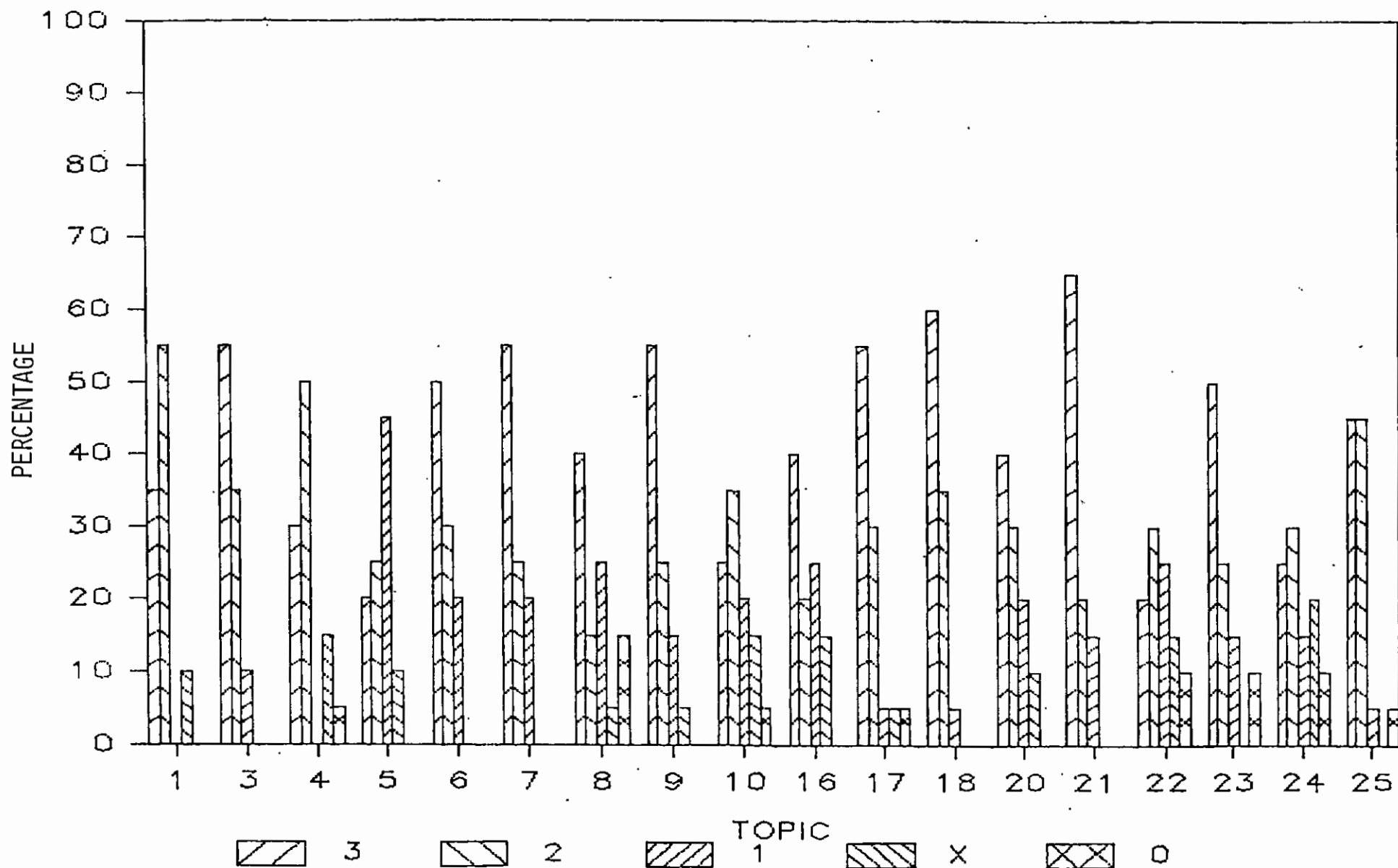
SEE KEY ON PAGES 356 AND 357

APPENDIX B.15: KNOWLEDGE CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE
AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985



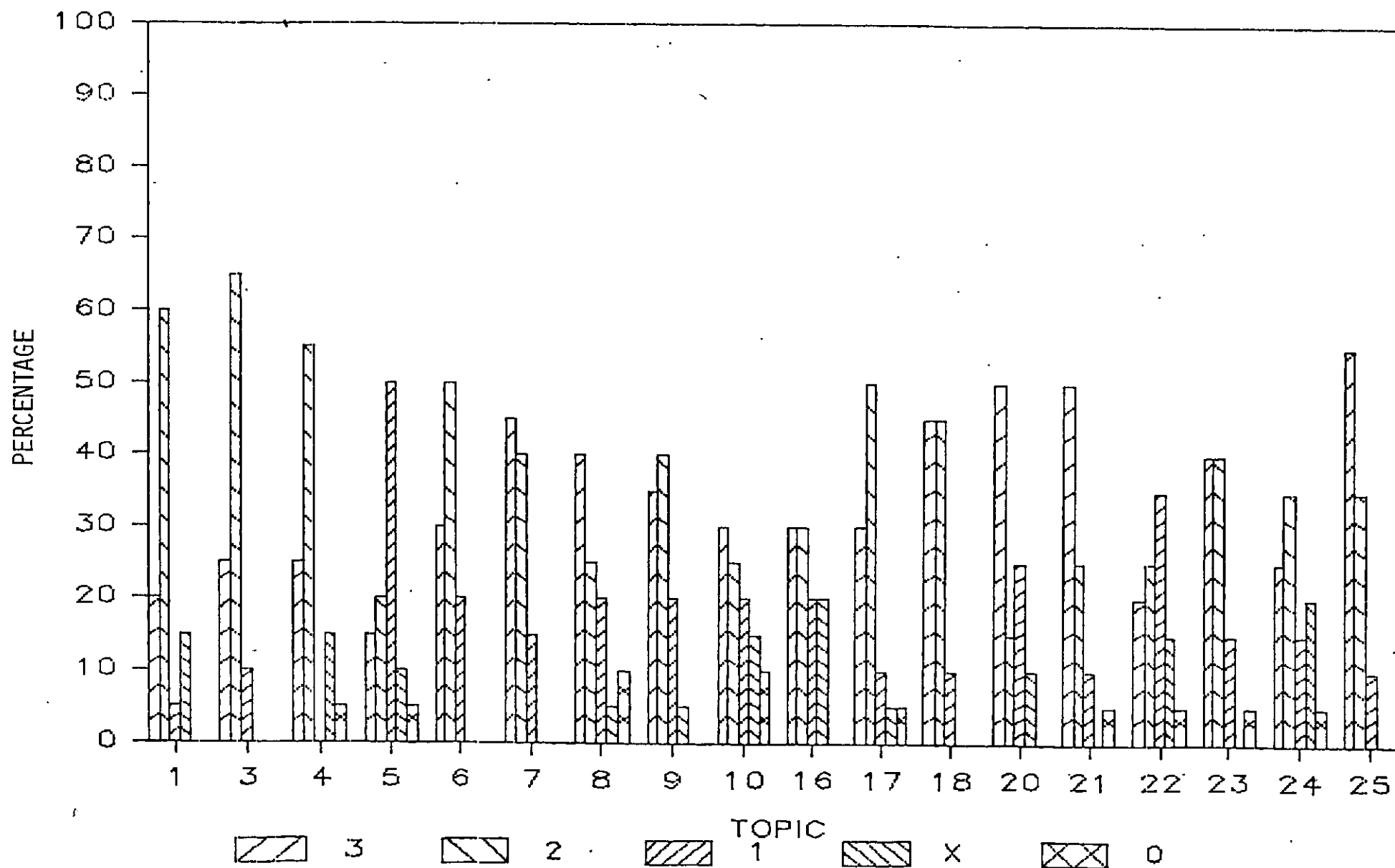
SEE KEY ON PAGES 356 AND 357

APPENDIX B.16: ATTITUDE CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE
AIRPORT HOTEL EXTENSION COURSE, LESOTHO, 1985



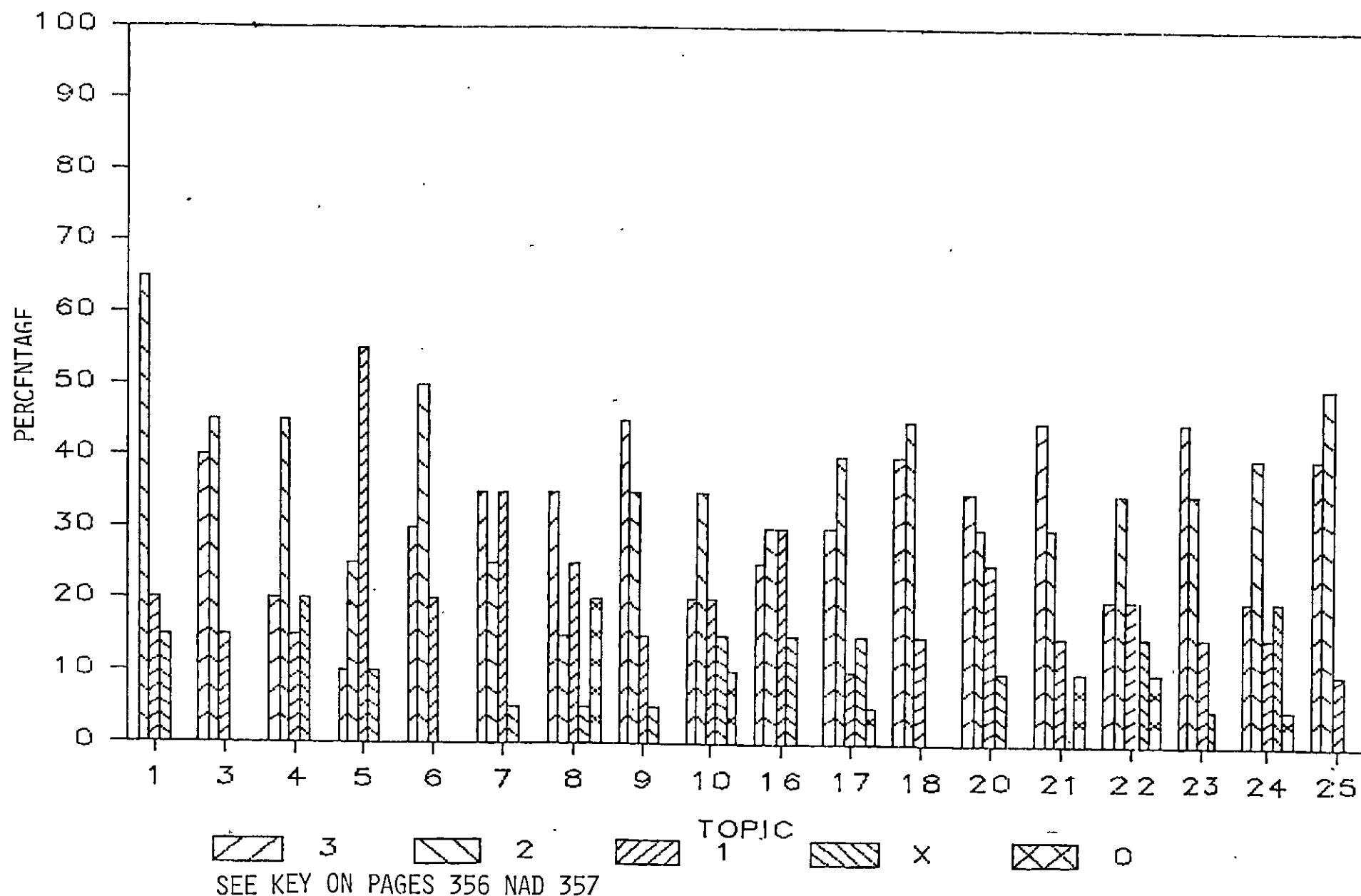
SEE KEY ON PAGES 356 AND 357

APPENDIX B.18: ASPIRATIONS CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE
AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985

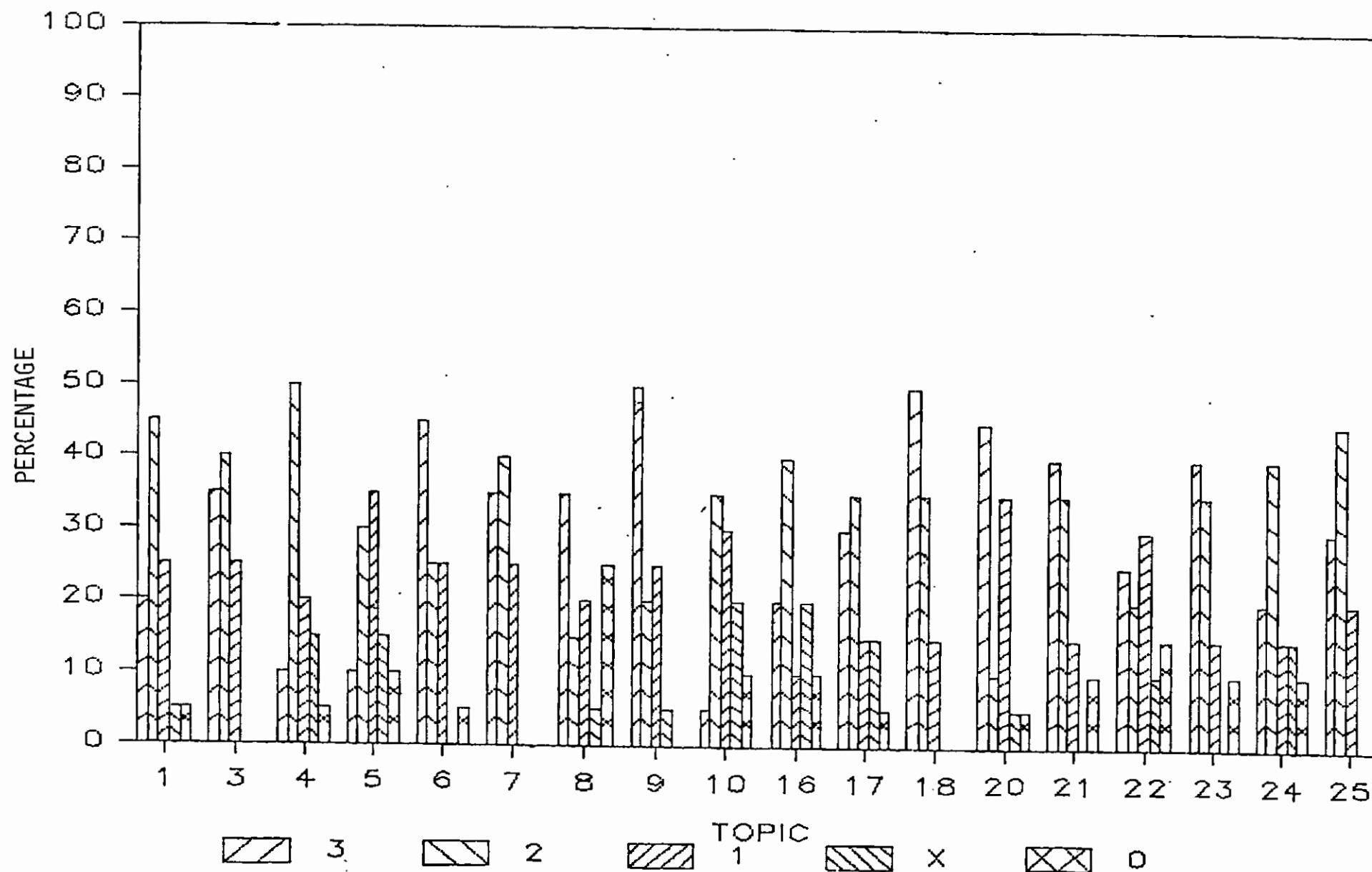


SEE KEY ON PAGES 356 AND 357

APPENDIX B.17: SKILLS CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE
AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985



APPENDIX B.19: PRACTICE CHANGE IN EXTENSION SUBJECTS FOR PARTICIPANTS IN THE
AIRPORT HOTEL EXTENSION EDUCATION COURSE, LESOTHO, 1985



SEE KEY ON PAGES 356 AND 357

APPENDIX C.1: RESPONSES FOR SAMPLE ATTENDING ONE EXTENSION EDUCATION COURSE, LESOTHO, 1985

COURSE	RESP. NO	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM
1	20	1	1	1	1	1	1	1	1	1	0	1	1	3
1	25	1	0	1	1	1	0	1	1	3	3	1	3	3
1	29	1	1	1	1	1	1	1	1	1	1	1	1	2
1	33	0	0	1	0	0	0	0	0	0	1	1	1	0
1	40	0	0	1	1	0	0	2	0	1	0	1	1	0

0 = YES

1 = NO

2 = N/A

3 = NO RESPONSE

APPENDIX C.2: RESPONSES FOR SAMPLE ATTENDING TWO EXTENSION EDUCATION COURSES, LESOTHO, 1985

COURSE	RESP. NO	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM
2	8	1	1	1	1	0	0	2	1	0	1	1	2	3
2	11	1	1	1	1	1	1	1	1	1	1	1	1	3
2	14	1	0	1	0	0	0	2	0	1	0	1	1	0
2	18	1	1	1	0	0	0	1	0	0	1	1	1	1
2	21	1	1	1	0	0	0	0	0	0	1	1	1	1
2	22	1	1	1	2	1	0	0	1	0	1	1	1	2
2	23	1	1	1	1	1	0	0	1	1	1	1	2	2
2	26	1	1	1	1	1	0	1	1	1	1	1	2	2
2	27	0	0	1	1	0	1	1	1	1	1	1	1	3
2	31	0	1	1	0	0	0	3	0	0	0	1	2	0
2	32	1	1	1	0	0	0	0	0	0	0	1	0	2
2	35	0	0	1	1	0	0	0	0	0	0	1	0	3
2	38	1	0	1	1	0	0	1	0	0	1	1	1	3
2	47	3	3	0	0	0	0	2	0	0	1	1	1	0
2	49	0	0	1	1	0	0	0	0	0	0	3	0	3
2	53	1	1	1	1	1	0	3	0	1	0	1	1	0
2	54	1	1	1	0	1	1	1	1	0	1	1	1	3

AA = MORE INCOME FROM FARMING
 BB = TRADING WITH NEIGHBOURS
 CC = ACQUISITION OF MORE PROPERTY
 DD = ACQUISITION OF BETTER ANIMALS
 EE = STORED AND/OR PRESERVED FOOD
 FF = BETTER MEALS FOR FAMILY
 GG = BETTER EDUCATION FOR CHILDREN
 HH = HIGHER CROP YIELDS
 II = BETTER CONDITION OF ANIMALS

JJ = ABLE TO PURCHASE IMPROVED INPUTS
 KK = ABLE TO SECURE CREDIT/LOANS
 LL = IMPROVED FARM RECORDS
 MM = BETTER MARKETS
 NN = OTHER
 OO = NO SIGNIFICANT BENEFITS

APPENDIX C.3: RESPONSES FOR SAMPLE ATTENDING THREE EXTENSION EDUCATION COURSES, LESOTHO, 1985

COURSE	RESP. NO	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM
3	1	1	1	1	1	0	0	0	0	2	1	1	1	1
3	2	0	0	1	0	0	0	0	0	0	1	1	2	0
3	3	0	0	1	1	0	0	1	2	1	1	1	2	0
3	4	0	0	1	1	0	0	0	0	2	1	1	2	0
3	5	0	1	1	1	0	0	0	0	0	0	1	2	0
3	6	1	0	1	1	0	0	0	0	1	0	1	2	0
3	7	1	1	1	1	0	0	0	0	1	0	1	2	0
3	15	1	1	1	0	1	0	1	0	1	0	1	1	0
3	30	1	1	1	0	1	0	1	0	1	0	1	1	0
3	36	1	1	1	1	0	1	1	1	1	0	3	1	0
3	39	1	1	2	1	0	1	1	1	2	2	1	1	0
3	41	1	1	1	2	1	0	1	0	1	1	1	1	0
3	42	1	1	1	1	0	0	2	0	1	1	1	1	0
3	43	0	0	1	0	0	0	0	0	2	0	1	2	0
3	44	0	0	1	0	0	0	0	0	0	0	1	2	0
3	46	1	1	1	0	0	0	0	0	0	0	1	2	0
3	48	1	1	1	1	1	1	1	0	0	1	1	2	0
3	50	1	1	1	1	1	0	1	0	1	0	1	0	0

0 = YES
 1 = NO
 2 = N/A
 3 = NO RESPONSE

APPENDIX C.4: RESPONSES FOR SAMPLE ATTENDING FOUR EXTENSION EDUCATION COURSES, LESOTHO, 1985.

COURSE	RESP. NO	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM
4	9	1	1	1	1	1	0	1	1	0	1	1	1	3
4	10	3	3	3	3	3	3	3	3	3	3	3	3	3
4	12	0	0	0	1	0	0	0	0	2	0	1	2	0
4	13	1	0	1	1	0	0	3	0	3	0	1	2	0
4	16	0	0	0	0	0	0	0	0	0	0	3	0	0
4	17	1	1	1	1	1	1	1	1	1	1	1	1	1
4	19	0	1	1	0	0	0	0	1	0	1	1	1	2
4	24	0	0	1	1	1	0	1	0	1	0	1	2	0
4	28	1	1	1	1	1	1	1	1	1	1	1	1	1
4	34	1	1	1	1	0	0	0	0	0	0	1	1	3
4	37	1	1	1	1	0	0	0	0	0	1	1	1	3
4	45	0	0	0	0	0	0	0	0	0	0	1	3	0
4	51	0	0	1	0	0	0	0	0	0	0	1	0	0
4	52	0	0	0	1	0	0	0	0	0	0	1	0	0

AA = MORE INCOME FROM FARMING
 BB = TRADING WITH NEIGHBOURS
 CC = ACQUISITION OF MORE PROPERTY
 DD = ACQUISITION OF BETTER ANIMALS
 EE = STORED AND/OR PRESERVED FOOD
 FF = BETTER MEALS FOR FAMILY
 GG = BETTER EDUCATION FOR CHILDREN
 HH = HIGHER CROP YIELDS
 II = BETTER CONDITION OF ANIMALS

JJ = ABLE TO PURCHASE IMPROVED INPUTS
 KK = ABLE TO SECURE CREDIT/LOANS
 LL = IMPROVED FARM RECORDS
 MM = BETTER MARKETS
 NN = OTHER
 00 = NO SIGNIFICANT BENEFITS

BIBLIOGRAPHY

- AID, Lesotho farming systems research project paper (unclassified). Washington: USAID, 1978.
- ANDERSON, C.A. Fostering and inhibiting factors. In: BREMBECK, C.S. and THOMPSON, T.J. eds. New strategies for educational development. Lexington: Heath, 1973.
- BAKER, D. Institutionalisation of farming systems research and extension in Botswana: current programmes and advantages of improved research-extension linkages. In: BUTLER FLORA, C. ed. Farming systems research, extension, implementation and monitoring, abstracts. Manhattan: Kansas State University, 1984
- BATH, W. Position description: extension communications specialist. Pullman: Washington State University, 1980.
- BECKERMAN, S.R. End of tour report/communications/information specialist. Maseru: FSR, 1981.
- BEMBRIDGE, T.J. Agricultural extension: the key to rural development in the present and former homelands. Alice: Fort Hare University Press, 1978.
- BEMBRIDGE, T.J. A systems approach to agricultural development in the national states of South Africa. Dublin: University College, 1982.
- BEMBRIDGE, T.J., STEYN, G.L. and WILLIAMS, J.L.H. An evaluation of the KwaZulu extension service. Alice: Agricultural and rural development research institute (ARDRI), 1983.
- BENNETT, C.F. Analyzing impacts of extension programmes. Washington: USDA, 1976.

- BENNETT, C.F. Teaching materials on "seven levels of evidence": A guide for extension workers. Washington: USDA, 1980
- BENNETT, C.F. Reflective appraisal of programmes (RAP): an approach to studying clientele-perceived results of cooperative extension programmes. Ithaca: Cornell University, 1982.
- BENOR, D. T & V: Putting intentions into practice. INTERPAKS Interchange. Urbana: University of Illinois, 1984.
- BERNSTEN, R.H. Site selection in project area. In: SHANER, W.W., PHILIPP, P.F. and SCHMEHL, W.R. ed. Readings in farming systems research and development. Fort Collins: CID, 1981.
- BOONE, E.J. The cooperative extension service. In: SMITH, R.M., AKER, G.F. and KIDD, J.R. eds. Handbook of adult education. New York: Macmillan, 1970.
- BOWN, L. Scope and purpose of adult education in West Africa. In: BOWN, L. and OLU TOMORI, S.H. eds. A handbook of adult education for West Africa. London: Hutchinson, 1979.
- BOWN, L. and OMOLEWA, M. The future. In: BOWN, L. and OLU TOMORI, S.H. eds. A handbook of adult education for West Africa. London: Hutchinson, 1979.
- BROWN, W.M., JR. Constraints in effective extension programme development in third world countries: the manpower development and deployment issue. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.
- BUTLER, L.M. Baseline survey methodological report. Pullman: Washington State University, 1982.
- CALLAWAY, A. Frontiers of out-of-school education. In: BREMBECK, C.S. and THOMPSON, T.J. eds. New strategies for educational development. Lexington: Heath, 1973.

- CAMPBELL, D.T. and STANLEY, J.C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1966.
- CHAMALA, S. and KEITH, K.J. Development of extension programmes within the context of FSR and D - conservation cropping case in Queensland. In: BUTLER FLORA, C. ed. Farming systems research and extension: implementation and monitoring, abstracts. Manhattan: Kansas State University, 1984.
- CLAAR, J.B., DAHL, D.T. and WATTS, L.H. The cooperative extension service: an adaptable model for developing countries. Urbana: INTERPAKS, undated.
- CLARK, R.C. Organization for work. In: SANDERS, H.C. ed. The land grant university's extension service. Corvallis: Oregon State University, 1973.
- COLLINSON, M. On farm research with a systems perspective as a link between farmers, technical research and extension. Report of a workshop on extension methods and research/extension linkages. Nairobi: CIMMYT, 1984.
- COOMBS, P.H. What it will take to help the rural poor. In: COOMBS, P.H. ed. Meeting the basic needs of the rural poor: the integrated community-based approach. New York: Pergamon Press, 1980.
- DEUTCH, K.W. Developmental change: some political aspects. In: LEAGANS, J.P. and LOOMIS, C.P. eds. Behavioural change in agriculture. Ithaca: Cornell University Press, 1971.

- DIAZ-CISNEROS, H. Plan Puebla: ten years of experience in promoting agricultural development among subsistence farmers of Mexico. In: NIEHOFF, R.O. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- DI FRANCO, J. Extension teaching is an art and Teaching vs. learning. In: MAUNDER, A.H. author-ed. Agricultural extension: a reference manual. Rome: FAO, 1973.
- DIXON, M. Farming systems research in Ethiopia. Office de la Recherche Scientifique et Technique Outre-Mer, 1979.
- DUVAL, G.H. Groups in the practical extension situation - an organizational model. Pretoria: University of Pretoria, 1978.
- EASTER, G. and HLOPE, D. Constraints and opportunities to extension training in Swaziland. In: BUTLER FLORA, C. ed. Farming systems research and extension: implementation and monitoring, abstracts. Manhattan: Kansas State University, 1984.
- ECKLUND P. Technology development and adoption-rates: systems approach for agricultural research and extension. Lusaka: Swedish Embassy, 1983.
- EICHER, C.K. International technology transfer and the African farmer: theory and practice. Harare: University of Zimbabwe, 1984.
- FARRAR, C. AID's policies for education and rural development. In: NIEHOFF, R.O. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- FOURIE, P.C. The illusive concept of development. Development studies Southern Africa. Vol.4 no.1. Pretoria; Benso, October 1981.

- FOX, D.J. The research process in education. New York: Holt, Rinehart and Winston, 1969.
- FRESCO, L. Approaches to the study of farming and cropping systems. In: BUTLER FLORA, C. ed. Farming systems research and extension: implementation and monitoring, abstracts. Manhattan: Kansas State University, 1984.
- FRUTCHEY, F.P. The learning-teaching process. In: SANDERS, H.C. ed. The land grant university's extension service. Corvallis: Oregon State University, 1973.
- GEBREGZIABHER, B. A case study of the ARSSI rural development unit (ARDU). In: NIEHOFF, R.O. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- GREENWOOD, M.N. New directions: the international mission of the cooperative extension service - a statement of policy. Washington: USDA, 1984.
- HARBISON, F.H. Human resources and nonformal education. In: BREMBECK, C.S. and THOMPSON, T.J. eds. New strategies for educational development. Lexington: Heath, 1973.
- HARRINGTON, L.W. and TRIPP, R. Recommendation domains: a framework for on-farm research. CIMMYT economics programme working paper 02/84. Mexico: CIMMYT, 1984.
- HARWOOD, R.R. Small farm development: understanding and improving farming systems in the humid tropics. Boulder: Westview Press, 1979.
- HAWTIN, G.C. et al. The Nile valley project: a model for cooperation between international and national programmes in

- research and extension. In: BUTLER FLORA, C. ed. Farming systems research and extension: implementation and monitoring, abstracts. Manhattan: Kansas State University, 1984.
- HAYAMI, Y. and RUTTAN, V.W. Agricultural development: an international perspective. Baltimore: Johns Hopkins University Press, 1971.
- HILDEBRAND, P.E. Motivating small farmers to accept change. In: SHANER, W.W., PHILIPP, P.F. and SCHMEHL, W.R. eds. Readings in farming systems research and development. Fort Collins: Colorado State University, 1981.
- HILDEBRAND, P.E. and WAUGH, R.K. Farming systems research and development. FSSP Newsletter. Gainesville. University of Florida, Springs 1983.
- HILDEBRAND, P.E. Commentary. Coming full circle: farmers' participation in the development of technology. Ottawa: International Development Research Centre, 1984.
- HILLIARD, J.F. Elements of an action program. In: Niehoff, R.O. ed: Nonformal education and rural poor. East Lansing. Michigan State University, 1977.
- HUDGENS, R.E. Subregional issues in the implementation of farming systems research and extension methodology - a case study in Zambia. In: BUTLER FLORA, C, ed. Farming systems research: extension implementation and monitoring abstracts. Manhattan: Kansas State University, 1984.
- JOHNSON, S.H. III and CLAAR, J.B. FSR/E: shifting the intersection of research and extension. In: BUTLER FLORA, C. Farming systems research and extension: implementation and monitoring, abstracts. Manhattan: Kansas State University, 1984.
- JONES, J.H., JR. Sociological implications in extension. In: SANDERS, H.C. ed. The land-grant university's extension service. Corvallis: Oregon State University, 1973.

- JONES, R.I. The systems approach in agriculture. Proceedings of the Grasslands Society of Southern Africa. Pietermaritzburg: ARI for Natal, 1978.
- JONES, G. (University of Reading) Our problem-solving origins. In: JOHNSON, E.L. ed INTERPAKS Interchange. Urbana: University of Illinois, March 1984.
- KALSHOVEN, G. Providing agricultural services in rice farming areas. Malaysian and Surinam experience. Wageningen: Agricultural University, 1981.
- KELLOGG, E.D. Constraints to developing effective extension programmes in agricultural assistance programmes: some brief observations. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.
- KELSEY, L.D. and HEARNE, C.C. Cooperative extension work. Ithaca: Comstock, 1949.
- KIRBY, R., GALLEGOS, P. and CORNICK, T. On-farm research methods: a comparative approach, experiences of the Quimiag-Penipe project, Ecuador. Ithaca: Cornell University, 1981.
- KLEENE, P. Experimental approaches in southern Mali. Coming full circle: farmers' participation in the development of technology. Ottawa: International Development Research Center, 1984.
- KUMAR, A. Education for rural development. In: BOWN, L. and OLU TOMORI, S.H. eds. A handbook of adult education for West Africa. London: Hutchinson, 1979.

- LA BELLE, T.J. Liberation, development and rural nonformal education. In: NIEHOFF, R.D. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- LAGEMANN, J. Farming systems research as a tool for identifying and conducting research and development projects. Turrialba: Tropical Agriculture Research and Training Center, 1981.
- LAKER, M.C. Community development as applicable to agriculture. Development studies Southern Africa, vol.4 no.1. Pretoria: Benso, October 1981.
- LEAGANS, J.P. Extension education and modernization. In: LEAGANS, J.P. and LOOMIS, C.P. eds. Behavioral change in agriculture. Ithaca: Cornell University Press, 1971.
- LEAGANS, J.P. Adoption of modern agricultural technology by small farm operators: an interdisciplinary model for research and strategy builders. Ithaca: Cornell University, 1979.
- LEE, D. Lesotho farming systems research project 1979-1986 (position paper). Maseru: FSR, 1985.
- LEEDY, P.D. Practical research: planning and design. New York: Macmillan, 1974.
- LOW, A. Farming systems research in Eastern and Southern Africa (paper). Mbabane: CIMMYT, 1984.
- MAGAGULA, G.T. A socio-economic analysis and evaluation of rural development areas in Swaziland. (unpublished Ph.D. dissertation). University of Maryland. Ann Arbor: University Microfilms International, 1978.
- MALONE, V.M. Human resources management: a constraint to successful extension services in international development

- work. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.
- MATOBO, T., SEFEANE, A. and YOUNG, D. Final report on the training courses for village agricultural committees, March 29 - April 30, 1982 (RD-R-12). Maseru: Lesotho Ministry of Agriculture, 1982.
- MATOBO, T. et al. Final report on the training course on "professional improvement in agricultural extension" (RD-R-15). Maseru: Lesotho Ministry of Agriculture 1982.
- MATOBO, T. and TRAIL, T.F. Evaluation of the workshop on "professional improvement in agricultural extension" (RD-B-8). Maseru: Lesotho Ministry of Agriculture, 1982.
- MATOBO, T. and TRAIL, T.F. Extension and agricultural subject matter training needs of subject matter specialist, district extension officers, and extension assistants (RD-B-6). Maseru: Lesotho Ministry of Agriculture, 1982.
- MAUNDER, A.H. Agricultural extension: a reference manual. Rome: FAO, 1973.
- MBOUBI, P.C. Human resources in the agriculture of the Congo. Paris: UNESCO, 1982.
- MCDERMOTT, J.K. Gaps between research and extension missions. In: JOHNSON, E.L. ed. INTERPAKS Interchange. Urbana: University of Illinois, May 1984.
- MCINTOSH, J.L. Indonesian cropping systems programme. In: SHANER, W.N., PHILIPP P.F. and SCHMEHL, W.R. eds. Readings in farming systems research and development. Fort Collins: Colorado State University, 1981.

- MOIR, P.E. Planning and evaluating structured international educational experiences (unpublished paper). Vancouver: University of British Columbia, undated.
- MOSHER, A.T. Technical cooperation in Latin American agriculture. 1957.
- MOSHER, A.T. Agricultural development. In: LEAGANS, J.P. and LOOMIS, C.P. eds. Behavioral change in agriculture. Ithaca: Cornell University Press, 1971.
- NESMAN, E.G. The basic village education project: Guatemala. In: NIEHOFF, R.O. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- NOBE, K.C. Organizational constraints to greater extension involvement in Agency for International Development - funded agricultural programmes in less developed countries. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.
- NORMAN, D.W. The farming systems approach to research. Farming systems research paper no.3. Manhattan: Kansas State University, 1982.
- NORMAN, D.W. Some problems in the implementation of agricultural research projects with a farming systems perspective. FSSP networking paper no.3. Gainesville: University of Florida, 1983.
- NTIRI, G., MCLACHLAN, M. and PIGOZZI, M.J. Education and agriculture. The NFE exchange. East Lansing: Michigan State University, 1980.
- PAIK, H.K. Nonformal education in Korea: programmes and

- prospects. In: BREMBECK, C.S. and THOMPSON, T.J. eds. New strategies for educational development. Lexington: Heath, 1973.
- PATTERSON, A.V. Visual aids. In: SANDERS, H.C. ed. The land-grant university's extension service. Corvallis: Oregon State University, 1973.
- PESSON, L.L. Extension programme planning with participation of clientele. In: SANDERS, H.C. ed. The land grant university's extension service. Corvallis: Oregon State University, 1973.
- PICKERING, D.C. The role of agricultural extension and some issues concerning current methodologies in sub-saharan Africa. Report of a workshop on extension methods and research/extension linkages. Nairobi: CIMMYT, 1984.
- PLUCKNETT, D.L. Farming systems concepts arising from the TAC review and personal experience. In: SHANER, W.W., PHILIPP, P.F. and SCHMEHL, W.R. eds. Readings in farming systems research and development. Fort Collins: Colorado State University, 1981.
- POEY, F. Conducting on-farm research by extensionists: an approach to effective transfer of technology. In: BUTLER FLORA, C. ed. Farming systems research and extension: implementation and monitoring, abstracts. Manhattan: Kansas State University, 1984.
- RAHIM, S.A. Nonformal aspects of the Comilla (Bangladesh) project. In: NIEHOFF, R.O. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- RAMAKHULA, C.M. Report on the nutrition course held at Nyakosoba research centre from the 1st to 4th March 1983 (RD-R-22).

Maseru: Lesotho Ministry of Agriculture, 1983.

RAMAKHULA, C.H. Report on the nutrition course held at Nyakosoba and Siloe research centres: Siloe from the 20-24 February 1984. Nyakosoba from the 7-11 May 1984 (BD-R-42). Maseru: Lesotho Ministry of Agriculture, 1984.

RAUDABAUGH, J.N. In search of better service. In: VINES, C.A. and ANDERSON, M.A. eds. Heritage horizons: extension's commitment to people. Madison: Journal of Extension, 1976.

RICHARDSON, E.V. Knowledge transfer in less developed countries. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.

POGERS, E.M. Diffusion of innovations. New York: The Free Press, 1983.

ROSE, C.J. and TAPSON, D.R. Small-farm systems research in Ciskei. Development Southern Africa. Vol.1 no.2. August 1984.

RUCKS, C. What kind of extension worker do we need? In: 1980 training for agriculture and rural development. Rome: FAO, 1981.

SANDERS, H.C. A brief history and The legal base, scope, functions and general objectives of extension work. In: SANDERS, H.C. The land-grant university's extension service. Corvallis: Oregon State University, 1973.

SANDERS, H.C. and MAUNDER, A.H. Why an extension service today? In: SANDERS, H.C. ed. The land grant university's extension service. Corvallis: Oregon State University, 1973.

- SAOUMA, E. FAO/CGIAR- "A common search." News from CGIAR. Washington: CGIAR, June 1984.
- SASTRAVAHA, S. Vocational agricultural education in Thailand. Paris: UNESCO, 1982.
- SCHRAMM, W. CHU, G.C. and YU, F.T.C. China's experience with development communications: how transferable is it? In: NIEHOFF, R.O. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- SCHUMACHER, A. World bank policies for rural development. In: NIEHOFF, R.O. ed. Nonformal education and the rural poor. East Lansing: Michigan State University, 1977.
- SEFEANE, A.S. Report on training of the village agricultural committees, July-August 1981. Maseru: Lesotho Ministry of Agriculture, 1981.
- SEFEANE, A.S. Report on training course for chiefs of Molumong, Nyakosoba and Siloe at Matela farmers training centre 21-25 February 1983 (RD-R-24). Maseru: Lesotho Ministry of Agriculture, 1983.
- SEFEANE, A.S. and RAMAKHULA, C.M. Report on training courses (for) extension workers and subject matter specialists (in) technical agriculture (RD-R-52). Maseru: Lesotho Ministry of Agriculture, 1985.
- SETSABI, A.M. Nonformal education and training for productivity and self-reliance in Lesotho (paper). Roma: National University of Lesotho, 1984.
- SHANER, W.W., PHILIPP, P.F. and SCHMEHL, W.R. Farming systems

- research and development: guidelines for developing countries. Boulder: Westview Press, 1982.
- SHANER, W. Linking extension with farming systems research. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.
- SHARMA, M. Planning and evaluating nonformal education: a systems model. Ambala Cantt: Indian Publications, 1980.
- SIGMAN, V.A. and SWANSON, B.E. Problems facing national agricultural extension in developing countries. Urbana: INTERPAKS, 1984.
- SIMKINS, T. Nonformal education and development. Manchester: Manchester Monographs, 1976.
- SMITHELLS, J.E. Agricultural extension work among rural women in selected developing countries. Education in developing countries of the commonwealth. Commonwealth secretariat, undated.
- STONE, H.J.S. The common and the divers: a profile of comparative education. Isando: McGraw-Hill, 1981.
- SWANSON, B.E. The role and contribution of agricultural extension in agricultural development. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.
- TOWNSEND COLES, E.K. Adult education in developing countries. Oxford: Pergamon Press, 1977.
- TOWNSEND COLES, E.K. Maverick of the education family. Oxford: Pergamon Press, 1982.

- TRENT, C. Lay leadership. In: SANDERS, H.C. ed. The land grant university's extension service. Corvallis: Oregon State University, 1973.
- TRAIL, T.F. Communications channels and sources of agricultural information utilized by farmers in the farming systems prototype areas of Siloe, Nyakosoba and Molumong in Lesotho (RD-B-7). Maseru: Lesotho Ministry of Agriculture, 1982.
- TSIU, L.D. Report on training of VAC's of Molumong at Mophhotlong ETC on 14 - 18 March, 1983. (RD-R-23). Maseru: Lesotho Ministry of Agriculture, 1983.
- VAN ROOYEN, J. A farm system approach. Development Southern Africa. Pretoria: May 1984.
- VAN ROOYEN, J. Farming systems research in less developed agriculture: the CGIAR network. Development Southern Africa. August 1984.
- VERMAAK, D. Workshop on the relationship between development and education and the role of non-formal education. Digest of multilateral activities. Pretoria: Interim Secretariat of the SATBVC States, April 1984.
- VITZTHUM, E.F. and FLORELL, R.J. The cooperative extension heritage. In: VINES, C.A. and ANDERSON, M.A. eds. Heritage horizons: extension's commitment to people. Madison: Journal of Extension, 1976.
- WARD, T., DETTONI, J. and MCKINNEY, L. Designing effective learning in nonformal modes. In: BREMBECK, C.S. and THOMPSON, T.J. eds. New strategies for educational development. Lexington: Heath, 1973.
- WARD, T.W. and HERZOG, W.A., jr. Effective learning in nonformal education. East Lansing: Michigan State University, 1977.

WASHINGTON STATE UNIVERSITY. Faculty Manual. Pullman: WSU, October 1984.

WATTS, L.H. and CLAAR, J.B. Knowledge transfer for agricultural development: history-limitations-importance. In: CLAAR, J.B. and WATTS, L.H. eds. Knowledge transfer in developing countries: status, constraints, outlook. Urbana: INTERPAKS, 1983.

WAUGH, R.K. The transfer of technology to farmers of small land holdings (paper). Guatemala: ICTA, 1978.

WIJESSORIYA, R.A. Cropping systems pilot production programme in Sri Lanka. Los Banos: IRRI, 1980.

WINKELMANN, D. The adoption of new maize technology in Plan Puebla, Mexico. Mexico, CIMMYT, 1976.

WINKELMANN, D. and MOSCARDI, E. Aiming agricultural research at the needs of farmers. In: SHANER, W.W., PHILIP, P.F. and SCHMEHL, W.R. eds. Readings in farming systems research and development. Fort Collins: Colorado State University, 1981.

YANG, H. Fact-finding with rural people. Rome: FAO, 1955.

YORK, E.T., jr. A look to the future. In: SANDERS, H.C. ed. The land grant university's extension service. Corvallis: Oregon State University, 1973.

YOUNG, D. V. Extension education abroad: an adventure in human sharing. In: BLUME, G. ed. Journal of extension. Madison: University of Wisconsin, March/April 1979.

YOUNG, D.V. and SEFEANE, A. Final report on the training

course on "extension for improvement of farming systems"
(RD-R-13). Maseru: Lesotho Ministry of Agriculture, 1983.

YOUMANS, D.V. and HOLLAND, D. Extending FSR results in Lesotho.
In : KEARL, S. ed Farming systems support project newsletter.
Gainsville: University of Florida, third quarter, 1983.

YOUMANS, D.V. A new model for the education of village
agricultural committee members at Nyakosoba and Siloe, Lesotho -
April 12 - 21, 1983. (RD-B-15). Maseru: Lesotho Ministry of
Agriculture, 1983.

YOUMANS, D.V. A research division response to subject matter
specialists' continuing educational needs. (RD-R-31).
Maseru: Lesotho Ministry of Agriculture, 1983.

YOUMANS, D. V. Farming systems research as an extension concept
(paper) Maseru: Institute for Extra-Mural Studies, 1984.

YOUMANS, D.V. End of tour report. Farming systems research in
Lesotho: Annual report. Maseru: Washington State University,
1984.

YOUMANS, D.V. Linkage question in Lesotho. In: JOHNSON, E.L.
ed INTERPAKS Interchange. Urbana: University of Illinois,
March, 1985.

YOUMANS, D.V. Lesotho chiefs remembered. INTERPAKS Interchange.
Urbana: University of Illinois, July 1985.

YOUMANS, D.V. RAMAKHULA, C, and LEE, D.J. The extension
challenge: a research report on ten extension schools for
agricultural professionals in Lesotho (RD-R-48). Maseru:
Lesotho Ministry of Agriculture, 1985.

SUMMARY

Farming systems research is an approach to agricultural development in which farmers join scientists in mutual, interdisciplinary problem solving activities on farmers' lands. In that context, extension education, a nonformal mode developed in the agricultural setting, plays a central and vital role in the dissemination of information and the diffusion of innovations.

The farming systems research and extension strategy has been at work in Lesotho since 1979 as a fully integrated policy in the Research Division of the Ministry of Agriculture and Marketing. Funded by the United States Agency for International Development, faculty members of Washington State University have worked as advisors and colleagues with national officers and members of farming communities in carrying out appropriate activities.

Extension education programmes have been conducted among a number of clienteles since 1981, addressing such areas of need as rural organization, village leadership, extension methods, and technical agriculture from a variety of fields and at several levels of instruction. Members of organized farmer contact groups as participants and diffusors, village chiefs and headpersons, and government extension workers and

subject matter specialists were three key target groups for extension education programmes.

This study concentrated on a threefold task. First, it undertook to review and substantiate the role and dynamics of extension education in agricultural development, in general and as reflected in farming systems research activities in Lesotho. Second, it sought to assess the impacts of extension education programmes in the above context in terms of changes in knowledge, attitudes, skills, aspirations (KASA), agricultural practices and, where possible, end results, using a reflective appraisal of programmes (RAP) methodology to ascertain those outcomes. Third, it expected to formulate conclusions and advance recommendations for the improvement of future such programmes based on the evidence thus derived, together with any other discoveries made during the course of the study.

In basing this research on the 1979 - 1984 segment of the farming systems research intervention in Lesotho, and in seeing it through to its contemplated closure, the researcher concludes that the outcomes demonstrate that there have been impressive, at times dramatic, KASA changes among the three key clienteles perceived by their members as directly related to the extension education programmes under study. Likewise, practice change in all three groups, while more

variable, was significant as vividly described by the participants themselves. Finally, end results, best seen among the farmer contact groups, disclosed such real benefits as better meals for families, higher crop yields, improved condition of animals and increased incomes. The members of those same farmers groups had become effective disseminators and diffusers, reaching nearly nine other farmers each.

It is further concluded that, while farming systems research is neither a panacea for low productivity nor a blueprint for Africa, it is a useful and dynamic development strategy, and that, as in other strategies, extension education is both central and critical to dissemination of information and diffusion of innovations. Extension education programmes, designed according to available resource levels, do produce positive change in participants' learning, practical behaviour and end benefits. Women, as a dynamic human resource in the development formula, must be considered in the design and delivery of extension programmes. And, urgent research into extension education for the developing world is required so that new flexible and realistic methodologies might be perfected to meet the challenge of the millennium.