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AGRICULTURAL MARKETING IMPROVEMENT STRATEGIES PROJECT

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Assisting AID Missions and Developing Country Governments
to Improve Agricultural Marketing Systems

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CAMEROON FERTILIZER SUB-SECTOR REFORM PROGRAM:

AGRICULTURAL CENSUS DATA ANALYSIS

INTERIM REPORT

JUNE 1992

CAMEROON FERTILIZER SUB-SECTOR REFORM PROGRAM

AGRICULTURAL CENSUS DATA ANALYSIS

INTERIM REPORT

JUNE 1992

Submitted to

The Technical Supervisory Committee
Government of Cameroon

and

USAID/Cameroon
Yaoundé

by

DJIME D. ADOUM

THE AGRICULTURAL MARKETING IMPROVEMENT STRATEGIES PROJECT

Abt Associates, Washington, D.C.
and
The University of Idaho/Postharvest Institute for Perishables

TABLE OF CONTENTS

Pages

GLOSSARY iv

ACKNOWLEDGEMENTS v

INTRODUCTION vi

1. TASK ONE 1
   - 1.1 Work completed to date 1
   - 1.2 Total crop farms 1
   - 1.3 Crop farms using fertilizers 1
   - 1.4 Crop farms and percent using chemical fertilizers 1
   - 1.5 Crop farms and percent using manure fertilizers 1
   - 1.6 Total quantities of chemical fertilizers used 6
   - 1.7 Total farms using fertilizers by province by season 6
   - 1.8 Remark 6
   - 1.9 Recommendations 8
     - 1.9.1 Obtaining data 8
     - 1.9.2 Obtaining data for the first 5 tables 8
     - 1.9.3 Obtaining data for the second set of 5 tables 8
     - 1.9.4 Work plan to generate the agricultural census data 8
     - 1.9.5 Additional tasks 9
     - 1.9.6 Format of SPSS files 9
     - 1.9.7 Graphs 10
     - 1.9.8 Final report 10

2. TASK TWO 11
   - 2.1 The 1992 ten-province fertilizer use survey 11
   - 2.2 Background information 11
   - 2.3 Survey objectives 11
   - 2.4 Confidentiality 11

   Questionnaire 12
   - Household characteristics 12
   - Patterns of crop production 14
   - Crops produced and varieties of seeds used 17
   - Types and sources of seeds used in crop production 18

Marketing 19
Markets 19
Proportion of crops sold 20
Chemical fertilizers 21
Use 21
Purchase 22
Purchase by type and by method of payment 23
Fertilizer application 24
Fertilizer availability by type 24
Fertilizer use by year by type 25
Reasons for increased fertilizer use by type 26
Reasons for decreased fertilizer use by type 27
Perception of users about fertilizer network 28
Distribution 28
Reasons for improved distribution 28
Reasons for worsened distribution 28
Knowledge about the different types of fertilizers 29
Non-users 29
Pesticides/Herbicides users 29
Information and sources of information 31
Format of the questionnaire 32

3. ACTIVITY INFORMATION 34
3.1 Purpose 34
3.2 Monitoring/Reporting 34
3.3 Summary budget 35
3.4 Other provisions 36
3.5 Research protocol for the ten-province fertilizer survey 37
3.6 Calendar of events 38
3.7 Questionnaire 38
3.8 Pilot survey 38
3.9 Data collection methodology 39

ANNEX A Tables to be produced from the survey A-1

GLOSSARY

AMIS	Agricultural Marketing Improvement Strategies Program
DEAPA	Ministry of Agriculture, Directorate of Statistics
FSSRP	Fertilizer Sub-Sector Reform Program
Minagri	Ministry of Agriculture
PSIE	Programme Spécial d'Importation d'Engrais (Special Fertilizer Import Program of the EC)
SOW	Scope of Work
USAID	United States Agency for International Development

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ANALYSIS OF AGRICULTURAL CENSUS DATA FROM DEAPA FOR THE FERTILIZER SUBSECTOR REFORM PROGRAM, USAID/CAMEROON

INTRODUCTION

This report is divided into several parts. Each part refers to a specific activity undertaken to complete a given task. Part I one deals with the analysis of Agricultural Census Data from the Ministry of Agriculture, Directorate of Statistics (DEAPA). Due to the incomplete data, the analysis done so far is limited to only a few tables and is shown here as an example of what will be done when more data becomes available. Part II deals with the survey instrument initially designed and used in seven provinces. It focuses on cash crops, such as coffee and cocoa. The survey instrument has been redesigned and reformatted to include all ten provinces in Cameroon. The upgraded instrument deals with export cash crops as well as food crops produced for consumption and sale, such as rice, maize, and beans. Part III deals with the protocol between the FSSRP and DEAPA and spells out the specific procedures required to collect and input data when the survey is completed.

The two specific tasks under the agronomists scope of work (SOW) were: (1) analysis of agricultural census data from 1984 through 1989, available from DEAPA, and (2) revision of a survey instrument to collect data from broader areas.

To complete the first task, the Mission and the Technical Supervisory Committee established guidelines and identified specific outputs. The Mission wished the census data to be analyzed according to the following general categories: (1) total number of crop farms and number of crop farms using fertilizers, (2) characteristics of farm operators (age, sex, education) using chemical fertilizers by type, season, province, and department; (3) characteristics of farms (size of holdings, type of crops grown, average quantities of fertilizers used, etc.); and (4) coffee production by type and variety of fertilizers. The purpose of the detailed analysis is to provide readily available data to all parties involved in the FSSRP. For this purpose, the FSSRP contracted with DEAPA to generate the data from various databases prior to the consulting team's arrival.

However, data from the DEAPA was not available when the team arrived. Efforts made to generate data resulted in erroneous and inconsistent outputs. As a result, many days were spent editing and reentering data.

1. TASK ONE

1.1 Work completed to date

Although little data became available in time for this analysis, some analysis was done. Raw data was transformed into histograms and presented as a sample of anticipated outcomes. Preliminary results revealed the usefulness of this kind of analysis and presentation when data is available to complete the analysis.

1.2 Total crop farms

Examination of Table 1 shows that the total number of crop farms remained stable over the 1984 - 1987 period at slightly over one million. However, the total number of crop farms varies significantly from one region to another. The Far North, the Center, the West and the North West have the highest number of crop farms respectively, followed by the North, the South, the West, East, Littoral, Adamaoua and the South. Analysis of variance of total crop farms and farms using fertilizers by department and by provinces revealed no significant differences among crop farms using fertilizers over 1984, 1985, and 1986. However, the percent of crop farms using fertilizers differed significantly among the provinces.

1.3 Crop farms using fertilizers

Data in Table 2 shows the percent of crop farms using chemical fertilizers. Fifty-one percent of crop farms used fertilizers in 1984, but the percentage of users dropped to 33.9, 35.9, 35.3, and 29.9 in the following years, with the most significant drop occurring in 1985 in the Far North. The West province has the highest number of crop farms using fertilizers, stabilizing at around 140,000 farms from 1984 to 1986 but dropping to approximately 114,000 in 1987. Analysis of the variance reveals significant differences in utilization among the provinces.

1.4 Crop farms and percent using chemical fertilizers

As shown in Table 3, far more crop farms use chemical fertilizers than manure fertilizers. About 52% of crop farms used chemical fertilizers in 1984, 68.8% in 1985, and about 75% in both 1986 and 1987.

1.5 Crop farms and percent using manure fertilizers

Overall, less than 25 percent of crop farms use manure fertilizers. As shown in Table 4, 24% of crop farms used manure fertilizers in 1984, dropping to 16% in 1985, increasing to 26.5% and dropping again to 22.3% in 1987. In 1984, the Far North was the heaviest user of manure fertilizer, followed by the South West, the North West and the East. The use of organic fertilizers varies by province and has declined consistently over the years.

Table 1. Total crop farms by province over 4-year period.

	Years			
Provinces	1984	1985	1986	1987
Far-North	285,130	244,150	260,330	243,810
East	66,640	64,490	72,450	71,300
Center	163,010	164,730	165,260	158,360
Littoral	65,680	70,800	69,980	77,380
South-West	74,960	90,060	84,870	88,210
North-West	132,120	127,040	130,730	127,890
West	159,360	172,480	181,240	167,530
North	98,740	112,590	112,790	109,270
Adamaoua	55,580	55,450	55,510	39,460
South	55,110	54,330	53,400	53,400
Total	1,156,330	1,156,120	1,186,560	1,136,610

Table 2. Crop farms using fertilizers by province, by year.

	Years							
Provinces	1984	%	1985	%	1986	%	1987	%
Far-North	209,610	73.5	58,520	24.0	90,630	34.6	56,650	23.2
Last	18,130	27.2	9,590	14.9	11,420	15.8	12,040	16.9
Center	4,660	2.9	3,000	1.8	2,700	1.6	850	0.5
Littoral	36,170	55.1	35,640	50.3	29,860	42.7	33,510	43.3
South-West	17,850	23.8	11,150	12.4	16,970	20.0	18,460	20.9
North-West	65,550	49.6	50,420	39.7	44,710	34.2	50,990	39.9
west	154,230	96.8	143,690	83.3	140,700	77.6	113,990	68.0
North	70,020	70.9	71,590	63.6	70,760	62.7	52,090	47.7
Adamaoua	14,670	26.4	7,850	14.2	10,930	19.7	1,480	3.8
South	480	0.9	110	0.2	190	0.4	0,000	0.0
Total	591,370	51.1	391,560	33.9	418,870	35.3	340,060	29.9

Table 3. Crop farms and percent using chemical fertilizers by province and by year.

Provinces	Years 1984	%	1985	%	1986	%	1987	%
Far-North	66,190	31.6	38,570	65.9	37,190	41.0	22,500	39.7
East	8,240	45.4	6,560	68.4	9,100	79.7	10,010	83.1
Center	2,770	59.4	1,870	62.3	2,240	83.0	850	100.0
Littoral	21,000	58.1	26,850	75.3	25,820	86.5	32,360	96.6
South-West	7,260	40.7	4,300	38.6	6,420	37.8	8,480	45.9
North-West	46,610	71.1	45,140	89.5	40,900	91.5	46,960	92.1
West	95,340	61.8	87,130	60.6	124,190	88.3	83,800	73.5
North	54,530	77.9	56,640	79.1	63,160	89.3	48,410	92.9
Adamaoua	6,020	41.0	2,400	30.6	5,130	46.9	650	43.9
South	140	29.2	110	100	150	78.9	0,000	0.0
Total	308,100	52.1	269,570	45.6	314,300	53.1	254,020	43.0

Table 4. Crop farms and percent using manure fertilizers by province and by year.

Provinces	Years							
	1984	%	1985	%	1986	%	1987	%
Far-North	89,110	42.5	13,420	22.9	29,610	32.7	10,470	18.5
East	9,520	52.5	3,030	31.6	1,320	11.6	2,030	16.9
Center	1,490	32.0	1,140	38.0	340	12.6	0	0.0
Littoral	1,620	12.8	26,850	75.3	1,970	6.6	630	1.9
South-West	10,020	56.1	3,870	34.7	10,550	62.2	8,320	45.1
North-West	9,990	15.2	5,560	11.0	1,970	4.4	2,040	4.0
West	8,420	5.5	490	0.3	1,340	1.0	1,070	0.9
North	4,340	6.2	1,680	2.3	1,750	2.5	110	0.2
Adamaoua	4,890	33.3	6,490	82.7	4,130	37.8	670	45.3
South	340	70.8	0	0.0	40	21.1	0	0.0
Total	142,740	24.1	62,530	16.3	53,020	26.5	254,020	22.3

1.6 Total quantities of chemical fertilizers used

Table 5 shows the total quantities of fertilizers used from 1984 through 1989. Quantities used differ significantly by province and by year. About 224,000 tons of chemical fertilizers were used nationwide in 1984, but dropped to about 127,000 tons in 1986. Total quantities jumped again to 168,000 tons in 1987 but dropped sharply to about 54,000 tons in 1988 and to about 36,000 tons in 1989. Chemical fertilizers appear to be more widely used in the West province, followed by the Littoral, the North West and the North. The West province appeared to have used significantly higher quantities in 1984.

1.7 Total farms using fertilizers by province by season

Examination of table 6 will show that the total farms using fertilizers by province during the first season remained stable over the 1984-86 period at around 450,000 tons. However, during the second season, there was a steep drop after 1984. The total number of farms using fertilizers during the second season dropped from 594,510 to 86,930 between 1984 and 1985. It then remained stable around 86,000 in 1986. The West, the Far North, the North and the North West respectively have the highest number of farms using fertilizers. Fertilizers are used less in the Center and the South provinces. Analysis of the variance of total farms using fertilizers by province by season revealed no significant differences among crop farms using fertilizers for the second cropping season over 1984, 1985, and 1986 for the second cropping season. For the first season, there is no significant difference among the South, Center, Adamaoua, East, South West and Littoral provinces. However, the North West, the Far North, the North and the West provinces are significantly different from the other remaining provinces. It is worth noting that the West could be considered a special case. The number of farms using fertilizers in that province alone represents 40% of farms using fertilizers nationwide.

1.8 Remark

The extreme annual variations in the import data suggest that the numerical values of the data should be considered more as relative numbers. For instance, according to Ministry of Agriculture (Minagri) data, fertilizers imported for distribution to small farmers have never exceeded 90,000 tons. Conversely, in 1989, under the FSSRP and Programme Spécial d'Importation d'Engrais (PSIE) programs, approximately 90,000 tons were imported. These discrepencies suggest that the DEAPA sampling frame may not be using a true representative sample of the population. In addition, changes in the sampling frame itself between 1986 and 1987 do not appear to have rectified the problem. DEAPA changed the Agricultural Census sampling frame again due to this problem. The new frame will be completed for their planned 1992 agricultural census. (No census was taken for the last two years). With this in mind, it should be noted that all absolute quantitative information contained within DEAPA database should not be taken as accurate. This information may have to be cross-checked against other sources to determine its accuracy.

Table 5. Comparison of farm crops using manure fertilizers to those using chemical fertilizers by province and by year.

Provinces	Years							
	1984		1985		1986		1987	
	chem	man	chem	man	chem	man	chem	man
Far-North	31.6	42.5	65.9	22.9	41.0	32.7	39.7	18.5
East	45.4	52.5	68.4	31.6	79.7	11.6	83.1	16.9
Center	59.4	32.0	62.3	38.0	83.0	12.6	100.0	0.0
Littoral	58.1	12.8	75.3	75.3	86.5	6.6	96.6	1.9
South-West	40.7	56.1	38.6	34.7	37.8	62.2	45.9	45.1
North-West	71.1	15.2	89.5	11.0	91.5	4.4	92.1	4.0
West	61.8	5.5	60.6	0.3	88.3	1.0	73.5	0.9
North	77.9	6.2	79.1	2.3	89.3	2.5	92.9	0.2
Adamaoua	41.0	33.3	30.6	82.7	46.9	37.8	43.9	45.3
South	29.2	70.8	100.0	0.0	78.9	21.1	0.0	0.0

1.9 Recommendations

As stated previously, approximately 19 tables needed to be generated from the DEAPA data covering 1984 - 1989 period. Those tables would be done by province, by department, by crops, by type of fertilizers and quantities by season. More than 600 tables could be generated. However, data extracted to date did not permit successful completion of the first five tables. The remainder of the document will be a series of specific recommendations to ensure successful completion of the preliminary work required for data analysis interpretation for the final report.

1.9.1 Obtaining data

Data should be secured in sets of five tables at a time. This is done to increase the accuracy of the outputs. Small increments are easily verifiable, and if/when extreme deviations occur, they can be easily detected and corrected.

1.9.2 Obtaining data for the first set of five tables

DEAPA should focus exclusively on generating data for the first five tables as specified in the scope of work. So far, data obtained are not complete. Only data for tables 1 through 5 covering the period 1984-1986 are available. A committee of three people (Rostand, Molu and Agoum) is charged with the responsibility of ensuring the accuracy of the data. Mr. Agoum should continue generating data. Molu and Rostand should focus on data verification. Any abnormal deviation should be brought to the attention of Mr. Agoum. This committee should meet once a week to finalize the accuracy and consistency of the data. This process should continue until the first set of data for Tables 1-5 is secured and fully verified. This first set appears to be the most complicated and the most important. It may prove to be the most useful when successfully completed. The task should be completed within thirty days.

1.9.3 Obtaining data for the second set of five tables

The process described above should serve as a guideline throughout the exercise. Since there are approximately nineteen tables, they can be generated in four sets. The first set of tables appears to be more complicated than the other sets. As such, all remaining sets should be secured in one additional month.

1.9.4 Work plan to generate the Agricultural Census Data

This is a tentative schedule for the completion of task related to Agricultural Census data. A committee of three is temporarily designated to carry out the assignment. This committee includes Mr. Moiu, Mr. Agoum, and Mr. Longang. Mr. Moore should be brought in periodically, as necessary. A preliminary meeting was already held with Mr. Molu, Mr. Longang, and Mr. Agoum. Each individual knows the task at hand and the extent to which the specified activities must be carried out for a successful completion. Data will be generated by

Mr. Agoum. Mr. Molu and Mr. Longang will verify the data for accuracy. Any abnormalities will be discussed with Mr. Agoum. This process continues until the task is completed. The following dates have been suggested as guidelines. They can be modified as necessary.

Date	Activity
April 20-30	Completion of tables 1-5 (Agoum)
May 1-3	Verification of data (Molu and Longang)
May 5	Committee meeting to discuss data
May 6-15	Completion of tables 6-10 (Agoum)
May 20	Verification of data (Molu and Longang)
May 21-30	Committee meeting to discuss data
June 5	Completion of tables 11-15 (Agoum)
June 8	Verification of data (Molu and Longang)
June 10	Committee meeting to discuss data
June 15-20	Completion of tables 16-19 (Agoum)
June 21	Verification of data (Molu and Longang)
June 23	Committee meeting to discuss data
July 1-30	Data entry in SPSS (Longang)
Early to late August	Verification of SPSS files (Longang)
Late August/ Early September	Return of the consultant for the analysis

1.9.5 Additional tasks

When the data are finally secured and verified, they should be entered into an SPSS file for further analysis. When the SPSS files are created, they can be used for further statistical analysis such as Analysis of Variance, Regression or Correlation. They can be exported into Lotus files to generate totals, percentages, etc. or they can be exported to Harvard Graphic to generate graphical presentations like those presented at the Limbe Conference. Creating SPSS files, entering data, saving, retrieving, and editing SPSS files can easily be done by Rostand. Training provided to him has enabled him to successfully complete some of the aforementioned tasks.

1.9.6 Format of SPSS files

The format of the SPSS files should conform to the following specifications, as the following example will illustrate. Referring to the scope of work and starting with Table 1, it is asked to generate data on:

total crop farms,
farms using fertilizers,
by type of fertilizers (manure/chemical),
by season,

by province, and
by department.

Given the above variables, the following format is then used to create the SPSS files. Given the following:

1 1 12345 445 345 100 1984

The first digit (1) is the province, the second digit (1) is the variable department, the third series of digits (12345) is the variable total crop farms; 445 is the variable farms using fertilizers; 345 is the variable farms using chemical fertilizers; 100 is the variable farms using manure fertilizers; 1984 is the variable year. When data for the first 5 tables are secured, the total file will look like this:

1	1	xxxxx	xxxx	xxx	1984
.	.	.....	....	...	....
10	x	.....	....	...	1989

The file can be expanded as data become available. Up to fifty variables can be stored in a single file with an unlimited number of obersvations. Rostand has the necessary training to create files according to specifications. He has already produced some outputs for the preliminary assignment, necessary for the extensive and detailed analysis to be performed by the consultant. Analysis can be done at the end of August by soliciting the services of a consultant via AMIS.

1.9.7 Graphs

When data are verified and stored, they can be used to generate histograms providing visual presentation of fertilizer use by province, department, season, crops, etc. A sample of graphs is found in the back.

1.9.8 Final report

When all the above mentioned preliminary tasks are completed, a final report can be written to meet the information needs of the FSSRP and all parties involved. As stated earlier, preliminary work can easily completed by the end of July 1992. FSSRP can contact AMIS to send a consultant for the analysis.

2. TASK TWO

2.1 The 1992 ten-province fertilizer use survey

The second sub-task involved the redesign of the survey instrument to be used to collect data from the ten provinces. The instrument has been revised and reformatted to be used for data collection in July 1992. The entire instrument is included in the report and is found in the following pages. The instrument is preceded by information on the background and the objectives of the survey and factors to consider to protect respondents' identities.

2.2 Background Information

In 1987, the Government of the Republic of Cameroon signed an agreement with the United States Agency for International Development (USAID) creating the Fertilizer Sub-Sector Reform Program (FSSRP). The goals of the FSSRP are as follows:

1) Improve importation and distribution of fertilizer;

2) Increase the responsiveness of fertilizer supply to demand;

3) Improve the effectiveness of on-farm fertilizer use; and

4) Create an adaptable and sustainable fertilizer sub-sector.

2.3 Survey Objectives

The purpose of the Fertilizer Use Survey is to provide information on fertilizer use at the farm-level. This will be done by gathering information from individual households throughout the province using a questionnaire. Information collected through the survey will be tabulated on a province-wide basis. Interpretation of this (and other) information will help guide planners in meeting FSSRP goals.

2.4 Confidentiality

Farming households are selected for interview at random, based on the sampling units defined by the National Directorate of the Agricultural Census within the Ministry of Agriculture. Information collected on individual survey questionnaires will be held strictly confidential and will not be used for other than the above-stated survey objectives.

Questionnaire

Province/Department: _____/____

No. Segment: _____

Name of Household Head: _____

Sex: 1. Male 2. Female

Person(s) Interviewed:
1-Household head
2-Other household member

. . . . . Enumerator:_____

. . . . . Date of Interview:__/__/__

Household Characteristics

How many people live in your household? ___ people

Please circle all that apply to you from the following professions?

Producers	0-No	1-Yes
Trading (bayam-sellem)	0-No	1-Yes
Artisanry (tailoring, repair, etc.)	0-No	1-Yes
Agricultural wage-labor	0-No	1-Yes
Other wage-labor	0-No	1-Yes
Other (specify)_____	0-No	1-Yes

Please check all items you possess from the following list:

Radio	0-No	1-Yes
Bicycle	0-No	1-Yes
Motorcycle	0-No	1-Yes
Automobile	0-No	1-Yes

Please indicate the level which best represents your schooling

Primary school 1
Secondary school 2
High school 3
University 4
Technical training 5

Are you a member of a cooperative? 0-No 1-Yes

If yes, give the name of the cooperative: _____

What is the total area of your farm? ___ hectares

How much of that area is currently cultivated?

1. 1/4
2. 1/3
3. 1/2
4. 3/4
5. all

Please select the items that best describe your farmland.

1. Owned
2. Rented

Patterns of Crop Production

Please select the crops you produce and state the purpose of production such as: for home consumption, for sale, or for both?

Crops	Not Produced	Produced for Home consumpt	Sale	Both
Coffee Robusta				
Coffee Arabica				
Cacao				
Maize				
Cotton				
Rice				
Millet				
Sorghum				
Beans				
Oil palm				
Cassava				
Cocoyams/Taro				
Yams				
Other (_____)				

Please select the crops you produce and indicate yield per growing season.

	Yield		
Crops	Kgs	Sacks	O. Units
Coffee Robusta			
Coffee Arabica			
Cacao			
Maize			
Cotton			
Rice			
Millet			
Sorghum			
Oil palm			
Beans			
Cassava			
Cocoyams/Taro			
Yams			
Other(_____)			

Please select the type of livestock in your farm operation (Circle all that apply)

Cattle . 0-No 1-Yes
Goats . 0-No 1-Yes
Sheep . 0-No 1-Yes
Pigs . . 0-No 1-Yes
Fowl . . 0-No 1-Yes

Do you grow crops in mixed stands?
1. Yes
2. No

If yes, write name of crop used in mixed stands with those listed on the left by putting an X in the corresponding box in the table below. In the example, we wrote maize and put an X next to beans to indicate the two crops used in mixed stands.

Types of crops grown in mixed stands

Crops	maize					
Coffee Robusta						
Coffee Arabica						
Cacao						
Maize						
Cotton						
Oil palm						
Millet						
Sorghum						
Beans	X					
Cassava						
Cocoyams/Taro						
Yams						
Other (_____)						

Crops produced and varieties of seeds used.

Please check the crops you produce and the type of seed used. Place an X in the corresponding box.

Crops	Varieties of seeds used		
	Traditional	Improved	Both
Coffee			
Cacao			
Maize			
Cotton			
Rice			
Millet			
Sorghum			
Oil palm			
Beans			
Cassava			
Cocoyams/Taro			
Yams			
Other			

Types and sources of seeds used in crop production

Please select the variety and sources of seeds you use in your farm operation by placing an X in the corresponding box in the table below.

Sources of seeds	Varieties of seeds used		
	Traditional	Improved	Both
Credit program			
Merchant			
Another farmer			
Saved your own			
Extension			
Research station			
Cooperative			

MARKETING

Markets

Please select the crops you produce and indicate markets you use to sell your crops by putting an X in the corresponding box in the table below.

	Markets					
Crops	Coop.	Local	Region.	Intern.	Merch.	O. farmer
Coffee Robusta						
Coffee Arabica						
Cacao						
Maize						
Cotton						
Rice						
Millet						
Sorghum						
Oil palm						
Cassava						
Cocoyams/Taro						
Yams						
Other (_____)						

Abbreviations: Coop. = Cooperative; Region. = Regional
Intern. = International; Merch. = Merchant
O. farmer = Other farmer

If crop is not sold locally, how far is the market? (_____ kms).

Proportion of crops sold

Please select the crop you sell according to proportions. Put an X in the corresponding box as shown in the table below.

	Proportions of crops sold			
Crops	A small portion	Half	Most	All
Coffee Robusta				
Coffee Arabica				
Cacao				
Maize				
Cotton				
Rice				
Millet				
Sorghum				
Oil palm				
Cassava				
Cocoyams/Taro				
Yams				
Other (_____)				

CHEMICAL FERTILIZERS

Use

Have you ever used chemical fertilizer? 0-No 1-Yes
if Yes, continue)

What type of fertilizers did you use this year? Check appropriate type from the list below.

1. N-P-K
   a. 20-10-10
   b. 10-30-10
   c. 12-06-20
   d. 22-10-15
   e. 15-20-15

2. Ammonium Sulfate
3. Urea
4. Other_____

Please select the crops you produce and the type of chemical fertilizer used on them. Put an X in corresponding box.

Chemical fertilizers used

Crops	N-P-K					Ammon. Sulfate	Urea	Others
	a	b	c	d	e			
Coffee Robusta								
Coffee Arabica								
Cacao								
Maize								
Cotton								
Rice								
Millet								
Sorghum								
Oil palm								
Cassava								
Cocoyams/Taro								
Yams								

Purchase

A. Please check markets where you buy your fertilizers by putting an X as indicated in the chart below.

Select the type of fertilizers bought and report the price per unit in the box corresponding to the type and market where bought in the table below.

1. N-P-K
2. Ammonium Sulfate
3. Urea
4. Other

Fertilizers	Markets: Coop.	Local	Regional	Merchant	Other farmers
N-P-K 20-10-10					
10-30-10					
12-06-20					
22-10-15					
15-20-15					
Ammonium Sulfate					
Urea					
Others					

Abbreviations: Coop. = Cooperative

If you travelled to purchase fertilizer, please report the distance _____ kms.

Fertilizer purchase by type and by method of payment

Please select the kind of fertilizers you purchase and the method by which you pay by putting an X in the corresponding box.

Method of payment	Type of fertilizers		
	N-P-K	A. Sulfate	Urea
Cash			
Credit			
Part cash, part credit			
Exchange with crops			
Free			

Please select the type of fertilizer you consider best suited for your farm?

1-Ammonium sulfate 1
2-Urea 2
3-NPK
20-10-10 3
10-30-10 4
12-06-20 5
22-10-15 6
15-20-15 7

8-Other 8 (specify_____)
9-No preference 9
10-Don't know 10

Please select the type of fertilizer you consider the second most suited type of fertilizer for your farm?

1-Ammonium sulfate 1
2-Urea 2
3-NPK
20-10-10 3
10-30-10 4
12-06-20 5
22-10-15 6
15-20-15 7

8-Other 8 (specify_____)
9-No preference 9
10-Don't know 10

Fertilizer application

Please select the type of fertilizer and the method by which you applied it by putting an X in the corresponding box in the table below.

Method of applications	Type of fertilizers		
	N-P-K	A. Sulfate	Urea
Scattered			
Along line			
Around each plant			
Between plants			
Incorporated in the soil			

Fertilizer availability by type

Please select the fertilizer and put an X in the corresponding box according to availability.

Availability of fertilizer	Type of fertilizers		
	N-P-K	A. Sulfate	Urea
Available on time			
Not available on time			
Available in right amount			
Not available in right amt			
Bought in good conditions			
Bought in poor conditions			
Good price			
Too expensive			

Fertilizer use by year by types.

Please select the type of fertilizer you used and the quantities you bought according years. Write the number of sacks in the corresponding box in the table below. See example of 20-10-10 in 1987/88.

Fertilizers	Years (Quantities - in sacks)				
	1987/88	1988/89	1989/90	1990/91	1991/92
N-P-K					
20-10-10	30				
10-30-10					
12-06-20					
22-10-15					
15-20-15					
Ammonium Sulfate					
Urea					
Other_____					
Other_____					

Reasons for increased fertilizer use by type

Please select the type of fertilizer used and your reason for using it by placing an X in the corresponding box in the table below.

N-P-K
- a. 20-10-10
- b. 10-30-10
- c. 12-06-20
- d. 22-10-15
- e. 15-20-15

Reasons	Types of fertilizers used						
	N-P-K					Ammonium Sulfate	Urea
	a	b	c	d	e		
Increased personal buying power							
More credit available							
Wish to further increase yields							
Crop prices higher							
Fertilizer easier to obtain							
Fertilizer prices lower							
Other (specify) _____							

Reasons for decreased fertilizer use by type:

Please select the type of fertilizer and your reason for not using it by placing an X in the corresponding box in the table below.

N-P-K
- a. 20-10-10
- b. 10-30-10
- c. 12-06-20
- d. 22-10-15
- e. 15-20-15

Reasons	Types of fertilizers used						
	N-P-K					Ammonium Sulfate	Urea
	a	b	c	d	e		
Decreased personal buying power							
Less credit available							
Found that it does not increase yields							
Crop prices lower							
Payment for crop not certain							
Fertilizer more difficult to obtain							
Fertilizer prices higher							
Other (specify) _____							

Perception of users about fertilizer network

Distribution

What do you think about fertilizer distribution now compared to before 1988?

1-Much better now	1
2-Somewhat better now	2
3-About the same as before	3
4-Somewhat worse now	4
5-Much worse now	5

Reasons for improved distribution

In what ways has fertilizer distribution gotten better now compared to 1988?

You are allowed to buy more fertilizer now	0-No 1-Yes
The fertilizer arrives on time now	0-No 1-Yes
More types of fertilizer are available	0-No 1-Yes
The quality of the fertilizer is better now	0-No 1-Yes
The fertilizer is less expensive now	0-No 1-Yes
Credit for fertilizer is more available now	0-No 1-Yes
The fertilizer is sold closer to your farm now	0-No 1-Yes

Reasons for worsened distribution

In what ways has fertilizer distribution gotten worse? Please place an X in the corresponding box in the table below.

You cannot find the quantities you want to buy	0-No 1-Yes
The fertilizer arrives late than usual	0-No 1-Yes
Fewer types are available now	0-No 1-Yes
The quality of the fertilizer is worse now	0-No 1-Yes
You have to go far to buy fertilizers	0-No 1-Yes
Credit for fertilizer is not available now	0-No 1-Yes
You are not sure about anything	0-No 1-Yes

Knowledge about the different types of fertilisers

Is there a difference between NPK 20-10-10 and 12-?6-20?

1-Yes	1
2-No	2
3-Do not Know	3

If Yes, what?_____

Is there a difference between Ammonium sulfate and Urea?

1-Yes	1
2-No	2
3-Do not Know	3

If Yes, what?_____

Non-users

Please indicate reasons for not using chemical fertilizers in your farm operation. (Circle all that apply).

Your farmland has:

1. fertile soil
2. rotational crop production
3. nitrogen fixing leguminous species
4. animals that provide readily applicable manure

You do not:

1. know about the advantages of chemical fertilizers
2. have money to buy them

You

1. used chemical fertilizers before and did not profit from them
2. lack information about their use and advantages

Pesticides/Herbicides Users

What kinds of chemicals do you use?

Chemicals to control insects and other pests 0-No 1-Yes

Crop for which you control_____

Give name of the chemicals_____

Chemicals to control weeds 0-No 1-Yes

Crop for which you control_____

Give name of the chemicals_____

Have you experienced any difficulties in getting these chemicals?

1. Yes
2. No

If yes, select response according to statements below.

Chemicals are not available for sale	0-No	1-Yes
Chemicals arrive late	0-No	1-Yes
Chemicals are not available in appropriate amount	0-No	1-Yes
Chemicals you need are not available	0-No	1-Yes
There is no credit available	0-No	1-Yes
Chemicals are sold too far away	0-No	1-Yes
Other (specify_____)	0-No	1-Yes
There are no problems	0-No	1-Yes

Pesticides/Herbicides Non-Users

State reasons for not using chemical pesticides/herbicides

Crops you grow do not need them	0-No	1-Yes
They are not worth the cost	0-No	1-Yes
They arrive too late to use	0-No	1-Yes
No credit available to buy them	0-No	1-Yes
They are sold too far away	0-No	1-Yes
Other (specify_____)	0-No	1-Yes

INFORMATION AND SOURCES OF INFORMATION

Do you seek information relating to your crop production?

1. Yes
2. No

If yes, where do you obtain information relating to fertilizer use and any other problem for your farm operation?

1. Neighbor
2. Extension agent
3. Private consultant
4. Fertilizer supplier
5. Cooperative
6. Radio programs
7. Television programs
8. Your own experience

Please select the sources of information you consult for problems relating to your farm production according to their usefulness as indicated in the table below.

Sources of information	Usefulness of information		
	Very useful	useful	not useful
Neighbor			
Extension agent			
Private consultant			
Fertilizer supplier			
Cooperative			
Radio programs			
Television programs			
Your own experience			
Development program			

END OF SURVEY

Format of the questionnaire

The quesionnaire is designed in such a way that each table can be used for a separate analysis. For example, the table of patterns of crop production can be used to study whether crops are produced for consumption, for sale or for both sale and consumption. Alpha-numeric combinations can be used as to code the variables. It should be remembered that not all variables need to be entered in the data base such as name of enumerator, name of household etc.

Illustration:

Let us assume 100 farmers filled out the questionnaire. To create a database, we do the following:

```
 1 1 1 1  12  1 1 1 0  10  25  1 1 1 2 3 1500
 . . . . .  . . . . .  .  . . . . . .
 . . . . .  . . . . .  .  . . . . . .
100 . . .  . . . . .  .  . . . . . .
```

In the above example:

Digits	Variables
1..100	No of records (1 through 100)
1	Province
1	Department
1	No of segment
12	No of people in household
1	Occupation
1	Items possessed
1	Level of schooling
0	Membership in cooperative
10	Total area of farmland
25	Proportion of cultivated farmland
1	Land tenure status
1	Crop produced (Coffee)
1	Produced for home consumption
2	Produced for sale
3	Produced for both
1500	Yield of coffee (in Kgs)

Although any number of variables can be used, it is suggested that they be kept under 25 per file. This limited number will be easier to handle in case the file is edited occasionally. Files can also be created according to variable of interest as specified in the survey instrument. It is not necessary to input variables by name. A digit suffices. Using digits will reduce labor

required for data input. A value label can be easily created during the analysis to specify the variable. In the example above, a value label can be created for the ten provinces as follows:

value labels province
1 'Far North'
2 'East'
3 'Center'
4 'Littoral'
5 'South West'
6 'North West'
7 'West'
8 'Adamaoua'
9 'North'
10 'South'

When the various data sets are created, they should printed and verified prior to analysis. Any abnormal deviation should be discussed by the committee and verified.

Data input

When the data are collected, they can be entered into an SPSS file for further analysis. When entering data into a file, all the X can be transformed into codes, as desired. Any combination can be used. If for example we are entering data from a table on crops and varieties of seeds used, the following can be done:

Crops can be coded as:
1 = coffee
2 = cacao
. = nth crop

Varieties of seeds used can be:
0 = traditional
1 = improved
2 = both types

This particular type of approach is chosen to allow maximum flexibility during data collection. It is much easier to fill out the questionnaire by putting an X than writing digits in the corresponding box. The data entry operator or the analyst can recode the Xs to his liking at data entry prior to the analysis.

3. ACTIVITY INFORMATION

This section deals with the protocols to be signed between the FSSRP and the DEAPA. This protocol lays out the specific activities to be undertaken for the completion of the survey and the monetary requirements between the two parties.

3.1 Purpose

The purpose of this activity is to provide appropriate farm-level data that will facilitate the task of raising performance of the fertilizer sub-sector. The activity will gather and interpret information on farm-level fertilizer use (rates and types), actual and perceived costs and benefits of fertilizer use, problems related to obtaining fertilizer, and levels of fertilizer and soil fertility knowledge, as well as other information appropriate to program goals.

3.2 Monitoring/Reporting

Brief monthly progress reports will be provided to the Technical Support Unit (TSU) of the FSSRP, with copies for USAID. Reports will discuss progress and problems of the survey, as well as information of expenditures. A preliminary version of the final survey report will be submitted for review by the TSU approximately one month prior delivery of the final document. A copy of the report will also be submitted to USAID for review. The final product of the survey will be a document to be delivered to the TSU with a copy for USAID. Also, a brief report will be delivered to the TSU, with a copy for USAID, which explains any problems with the questionnaire, the sample, the methodology, or the analysis.

3.3 Summary budget

Total budget requirement: 21,850,000 FCFA

BUDGET FOR TEN-PROVINCE FERTILIZER STUDY (FCFA)

ITEM	Number	Units	Price	Total
Perdiem (Service Central)				
Cadres				
1 x 12 days				
x 10 Provinces	84	days	15,000	1,260,000
Drivers				
1 x 12 days				
x 10 Provinces	84	days	6,000	504,000
Perdiem (Service Exterieurs, Provincial Level)				
Chiefs of Service/Assts.				
3 x 2 days				
x 10 Provinces	42	days	10,000	420,000
Drivers				
1 x 2 days				
x 10 Provinces	4	days	4,000	56,000
Perdiem (Service Exterieurs, Departmental Level)				
Chiefs of Section/Assts.				
3 x 3 days				
x 34 Departments	306	days	7,000	2,142,000
Drivers/Enumerators				
5 x 3 days				
x 34 Provinces	510	days	4,000	2,040,000
Fuel (Service Central)				1,500,000
Fuel (Provincial Level)	10	provinces	50,000	350,000
Fuel (Departmental)	40	depts.	75,000	2,550,000
Maintenance				

Service Central	2	vehicles	125,000	250,000
Provincial	10	vehicles	80,000	560,000
Departmental	40	vehicles	100,000	3,400,000
Transportation of				
Questionnaires	10	provinces	75,000	525,000
Printing Costs/				
Report Preparation				1,000,000
Supplies				1,500,000
Unexpected (10%)				1,806,000
SUBTOTAL				**19,863,000**
Bonus if work completed on time and meets all requirements (10%)				1,987,000
TOTAL				21,850,000

3.4 Other Provisions

The protocol outlines procedures and provides specifications for the complete survey implementation including; calendar of events; questionnaire; pilot survey; data collection methodology; data entry, cleaning, and analysis; reporting requirements; final survey products; and other appropriate information.

ACTIVITY PROGRAMMING DOCUMENT: 3-103-90-01-00

1. A list of single- and two-variable tables to be produced from the survey data and included in the final document is found at the end of the document.

2. Payment for the work will be in two installments. The first installment will be an advance of 50 percent of the contract amount that will be payable once this document is signed. The remainder of the contract amount will be paid once all the terms of this document have been fulfilled. All payments will be made by the Caisse Autonome d'Amortissement (CAA) on the basis of a request for payment from the executing organization that has been certified by the President of the TSC.

3. To encourage quality and timeliness, a performance bonus of 10 percent will be added to the total contract value if all requirements have been met as specified and the final document is of sufficiently high quality.

4. Prerequisite to the awarding of the contract is a Letter of Commitment addressed to the Technical Supervisory Committee (TSC) of the FSSRP signed by the appropriate members of the executing organization. The Letter of Commitment will be an agreement between the executing organization and the FSSRP stating that the organization is committed to complete implementation of the survey as specified in the Research Protocol, and is in accordance with the proposed budget.

3.5 Research Protocol For The Ten-Province Fertilizer Survey

Summary Information

Name of survey:	Ten-Province Fertilizer Survey
Contracting institution:	Fertilizer Sub-Sector Reform Program
Contracted institution:	Direction des Enquêtes Agro-Economique et de la Planification Agricole (DEAPA), Ministry of Agriculture
Provinces:	Centre, East, Littoral, North West, South, South West, West, Adamaoua, Extreme Nord, [illegible]d
Supervisor:	Zacharie Perevet
Title/position:	Director, DEAPA, Ministr[illegible]iculture
Principal Investigator:	René Mbappou Chief of Service for Survey Operations

3.6 Calender of events

	FROM	TO
Questionnaire preparation	mid April	end April
Training for pilot survey	begin May	end May
Pilot survey	mid June	mid July
Printing of questionnaire manual, preparation	mid July	end July
Training for main survey	mid July	end July
Data collection	mid August	end September
Data entry, analysis	mid September	end October
Analysis, preparation of preliminary report	begin November	end November
Final Report Due:	31 December, 1992	

3.7 Questionnaire

The basic questionnaire will be provided by the FSSRP. The phrasing of questions and answers can be modified according to the experience gained in the pilot survey. In addition, questions may be eliminated if the information is available from the Agricultural Survey. In this case, the variables must be transferred from the Agricultural Survey files and used in the tabulation of the fertilizer survey. In any case, the final version of the questionnaire should be authorized by the Technical Support Unit (TSU) of the FSSRP before the main survey is begun. Mr. Molu had already seen the draft and agreed with the proposed format.

3.8 Pilot survey

A pilot survey will be undertaken to train the enumerators, establish procedures, and identify problems. Problem questions or answers can be rephrased if necessary. The sample size of the pilot survey should be around 5% of the sample size of the main survey. It need not cover all ten provinces, however it should include at least two provinces. One possibility would be to pilot test the instrument on four provinces: (1) major fertilizer consumer for coffee, (2) major fertilizer consumer for foodcrops, (3) major fertilizer consumer for foodcrops (vegetables), and (4) not a consumer of fertilizers (for example, the South or Adamaoua). The pilot survey will be done concurrently to the 1992 Agricultural Census pilot survey.

3.9 Data collection methodology

Universe: The universe will be the agricultural population of the ten provinces

Sample size: The sample size will be approximately 485 households.

Sampling: The survey will use a sub-sample of the households in the Agricultural Survey sample. This sample is based on "segments," of which there are around 485 in the seven southern provinces (is it the same for the other three northern provinces). The households will be selected in such a way that there are at least 55 to 65 households in each of the ten provinces and approximately 10 to 15 households in each of the 34 departments in those provinces. Ideally, only one household per segment will be selected to avoid clusters of interviewed households. The sampling will be done concurrently to the first round of the 1992 Agricultural Census survey.

Data entry, cleaning, and analysis

Computer: The Directorate of Statistics has a number of IBM-compatible computers with hard disks that may be used for data entry. SPSS should be used to create files and to input data.

Data entry: Data entry should be discussed among Mr. Molu, Mr. Longang and Mr. Agoum. When data are all entered, a hard copy should be printed out and verified by the same committee. When data are all verified, a replica should be given to FSSRP. Rostand has been trained in SPSS. He is now capable of creating, entering and editing data sets. This preliminary work must be completed before the return of the consultant to finish the analysis.

Tabulation: Simple tabulations could be done by DEAPA. However, once the data are all verified, it is not advisable to ask DEAPA to do the analysis. DEAPA is shorthanded and will not do the analysis in due time. FSSRP should look for a qualified firm either locally or ask a consulting firm from the United States to perform the analysis. Given past experience with DEAPA, it is advisable to sollicit the services of a consultant through AMIS from the U.S. to do the analysis. Bringing a consultant from U.S will ensure timely and efficient data analysis.

Reporting requirements to the FSSRP

Brief monthly progress reports will be provided to the TSU until the final document is delivered. They will include a description of progress and problems of the survey, as well as an update on expenses by budget category. The reports should be brief (2-4 pages, single-spaced) and concise. The reports should have a consistent format.

Final products of the survey

When the first raw averages and frequency counts are available, copies will be submitted to the TSU for preliminary review, with a copy for USAID. A preliminary version of the final report (see below) will be submitted to the TSU, with a copy for USAID, for review approximately one month before the final document is due. This will give the TSU the opportunity to make comments and/or suggestions as to what changes might make the document better suited to FSSRP objectives. A final report will be delivered to the TSU, with a copy for USAID, in French or English including 1) an executive summary at the beginning, 2) a table of contents with headings and subheadings, 3) the body which contains tables and their interpretations, and 4) an annex briefly describing the methodology. Additional annexes may be added as needed. In order to standardize among surveys, a specified format will be followed. In addition, a brief report (4-8 pages single-spaced) will be submitted to the TSU, with a copy for USAID, which explains any problems with the questionnaire, the sample, the methodology, or the analysis. This is intended to provide lessons for future surveys. Copies of the complete data files are to be made available to the TSU. The files should be in ASCII or created in SPSS for advanced statistical analysis.

Budget and allowable expenses

The FSSRP will pay the entire amount of the grant whether or not expenses were as much as budgeted. The contractor will perform all specified work, whether or not the expenses exceed budget. Half of the grant will be paid at the beginning of the survey and the other half upon completion of the final reporting requirements.

Allowable budget items include the costs of per diem, fuel, minor repairs, office supplies, reproduction of documents, and other minor supplies. It will not cover the cost of equipment (vehicles, motorcycles, computers, etc.) nor the salaries of people already under salary.

ANNEX A

TABLES TO BE PRODUCED FROM THE SURVEY

1. Single variable tables

The mean of each continuous variable in the questionnaire should be reported, as well as the frequency distribution of each discrete variable collected. Tables may be generated as needed.

Household Characteristics
Average household size
Average farm size
Average cultivated area
Type of occupations
Average number of years schooling for husband
Membership in a cooperative
Type of livestock
Land tenure status

Crop Produced
Monocropping and mixed stands
Coffee
Cocoa
Maize
Cotton
Rice
Millet
Sorghum
Beans
Oil Palm
Others (to be specified)

Marketing
Percent produced for consumption
Percent marketed
Percent used both

41

Markets
Cooperatives
Local
Regional
National
International
Other farmers

Fertilizer User
Percentage buying fertilizer in past five years
Percentage buying fertilizer last year
Percentage by frequency of fertilizer purchase
Percentage by best type of fertilizer for farm
Percentage by second best type of fertilizer for farm
Average number of bags used for each fertilizer type
Average price per bag for each fertilizer type
Average distance to buy fertilizer
Percentage by mode of application
Percentage mixing fertilizer into soil
Percentage by where fertilizer purchased
Percentage by mode of purchase
Percentage able to buy as much as wanted
Percentage by reason why not able
Percentage for whom fertilizer arrived on time
Percentage by month they would like it available
Percentage for whom desired type of fertilizer was available
Percentage by type of fertilizer wanted but not available
Percentage for whom fertilizer quality was good
Percentage by reason fertilizer was not good
Percentage who have increased or decreased purchases
Percentage by reason for buying less fertilizer
Percentage by reason for buying more fertilizer
Percentage by evaluation of distribution system
Percentage by reason for thinking distribution better
Percentage by reason for thinking distribution worse

Fertilizer Non-User
Percentage by method of maintaining soil fertility
Percentage of non-users believing fertilizer increases yield
Percentage by reason for thinking it will not
Percentage believing fertilizer is worth cost
Percentage by reason for thinking it is not worth cost
Percentage by reasons for not buying fertilizer
Percentage knowing where to buy fertilizer

Average distance to point of sale

Fertilizer Knowledge
Percentage by source of information about fertilizer
Average number of times visited
Percentage knowing which fertilizer has most nitrogen
Percent knowing difference between various formulations of N-P-K
Percent knowing difference between Ammonium Sulfate and Urea

Pesticides/Herbicides users

Pesticides/herbicides non-users

Information and sources of information used by producers

Sources of information more valued than others

2. Tables

Tables should be selected and generated according to specific need. Any number of variables could be used. A given percentage or average should not be based on fewer than 15 households. The following themes should be covered:

1. Type of fertilizer by fertilizer practices and sources
2. Type of fertilizer by crop fertilized
3. Use/non-use of fertilizer by household characteristics (e.g. number of people, external income, durable goods, cooperative membership)
4. Use/non-use of fertilizer by agricultural characteristics (e.g. farm area, animals, coffee production)
5. Use/non-use of fertilizer by delay time in coffee payments
6. Use/non-use of fertilizer by distance to point of sale
7. Knowledge of fertilizer by household characteristics
8. Knowledge of fertilizer by agricultural characteristics
9. Knowledge of fertilizer by extension visits
10. Evaluation of distribution system by household characteristics
11. Evaluation of distribution system by agricultural characteristics
12. Agricultural characteristics by region
13. Household characteristics by region
14. Fertilizer practices by region