MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

Directorate of Economics

Research Paper Series

Representative Characteristics of Rural Households In Areas of Central and Southern Mozambique Affected by The 2000 Floods

by

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The Directorate of Economics of the Ministry of Agriculture and Rural Development maintains two publication series for research on food security issues. Publications under the *Flash* series are short (3-4 pages), carefully focused reports designed to provide timely research results on issues of great interest. Publications under the Research Paper series are designed to provide longer, more in-depth treatment of food security issues. The preparation of *Flash* reports and Research Reports, and their discussion with those who design and influence programs and policies in Mozambique, is an important step in the Directorates's overall analysis and planning mission.

Comments and suggestions from interested users on reports under each of these series help identify additional questions for consideration in later data analysis and report writing, and in the design of further research activities. Users of these reports are encouraged to submit comments and inform us of on-going information and analysis needs.

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This timely study is possible because many people and organizations over the years have worked with the Ministry of Agriculture to collect and maintain a nationally representative data base on rural household characteristics and behavior-TIA (Trabalho de Inquerito Agricola ao Sector Familiar em Mozambique). Although the data represent conditions during the cropping season of 1996, they are the most recent available and it is believed that they can provide a conservative indication of the social and economic conditions prevailing in these areas prior to the serious floods of early 2000. The intent of this timely report is to provide local Community, Government, NGO and Donor representatives basic descriptive information to assist in rehabilitation program and project design.

Rui Benfica and Pedro Arlindo are presently resident in East Lansing, Michigan where they are completing graduate degrees (PhD and MS) in the Department of Agricultural Economics at Michigan State University. They unselfishly contributed their time to complete the computer analysis and write-up for this report during their Spring Semester school vacation (March 5-11). Many thanks to them, and to Professors Michael Weber and David Tschirley.

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TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

1.1. Objectives

The worst floods in nearly 50 years in parts of Southern and Central Mozambique have resulted in death and serious damage to people, crops and livestock, as well as to rural housing, communication infrastructure and small and large-scale business assets of many kinds. As flood waters recede and immediate emergency needs are determined and increasingly met, local and national Government, as well as NGO and Donor organizations are turning attention to conceptualizing and designing longer-term rehabilitation program and projects. Systematic information about the rural population in the affected areas is needed to assist these efforts.

The primary objective of the report is to utilize an existing rural household data base to describe to the maximum extent possible key social and economic characteristics of smallholder farmers in the flood areas.

1.2. Methods

The Ministry of Agriculture and Rural Development completed for the 1995/96 agricultural season a survey of smallholder agriculture (some 3889 family sector households were interviewed). This data base is referred to as the TIA-96 Survey. It collected information about smallholder household demographic characteristics, production and marketing of smallholder household agricultural and livestock production, as well as land ownership and use, and participation of household members in farm and non-farm labor markets.[1] The TIA-96 random survey was undertaken in 60 of the 141 districts representing all ten Provinces of Mozambique.

[1] See NDAE Working Paper 27. Micro and Small Enterprises in Central and Northern Mozambique: Results of a 1996 Survey, September, 1997, downloadable at: http://www.aec.msu.edu/agecon/fs2/mozambique/wps27.pdf See also Benfica, Rui. An Analysis of the Contribution of Micro- and Small Enterprises to Rural Household Income in Central and Northern Mozambique. M.Sc. Thesis. March 1998, downloadable at: http://www.aec.msu.edu/agecon/fs2/mozambique/Rui.pdf
See also "Smallholder Agriculture in Mozambique: Report from the 1996 Trabalho de Inquerito Agricola - TIA96." A report submitted to Department of Statistics, Directorate of Economics, MAP by MAP/MSU Food Security Project.).

In each district selected, 8 villages were in turn randomly selected, and then 8 households were interviewed in each village.

Table 1 displays a listing of the Provinces and Districts affected by the recent floods (as of March 8, 2000) developed by the World Food Program in cooperation with local officials. The table also indicates the Districts covered (and the number of smallholder households surveyed) during the TIA-96 survey. Comparing identified flooded areas and those sampled by TIA-96, there is an overlap of 10 out of a total of 22 Districts affected. For all Provinces except Manica, TIA-96 surveyed the Districts with the most flood affected population. For example Manhica District in Maputo Province has the most people affected and it was surveyed by TIA-96. The same holds true for Chokwe in Gaza Province, Guvuro District in Inhambane and Buzi District in Sofala.

Based on this degree of overlap, it was decided to utilize the TIA-96 data to try to characterize representative household resources and economic activities in flood areas affected in each Province. All descriptive results presented in Tables 2 to 8 are based on the sample size permitted by the data, and need to be used with caution. As shown in Table 1, the degrees of freedom are smallest for Inhambane (58 observations) and Manica (62 observations). But these are also the Provinces where the number of affected population are relatively small compared to the most affected locations. While larger sample sizes and good geographic coverage are always preferred, it appears that it is reasonable to use the TIA-96 data to gain an understanding of some of the key characteristics of affected rural households, especially for those Provinces where the TIA-96 sample size is larger.

Tables 2 to 8 contain estimates of provincial-level averages for many different variables, as the number of observations are considered too small to undertake useful analysis at the district-level. The tables also report estimates of overall averages for the entire flood affected area in Southern and Central parts of the country. These are based on a much larger number of observations, but are still limited by the geographical coverage of Districts covered by TIA-96 that were also flood affected.

Table 1: Flooded Areas and TIA-96 Agricultural Survey Sampled Areas

Province and District	Total (Yr. 2000) Population*	Affected Population*	% of Affected Population*	Districts Covered in TIA-96	Number of HHs Surveyed by TIA-96
Maputo					
Boane	66,481	10,000	15%		
Magude	36,148	10,000	28%	X	64
Manhica	133,566	72,000	54%	X	64
Maputo	1,018,938	50,000	5%		
Marracuene	45,954	40,000	87%		
Matutuine	37,949	10,000	26%		
Moamba	42,385	40,000	94%		
Namaacha	38,331	2,000	5%	X	64
Gaza					
Bilene	151,764	25,000	16%	X	64
Chibuto	166,536	40,000	24%	X	64
Chokwe	207,175	207,000	100%	X	64
Guija	63,048	20,000	32%		
Mabalane	27,892	4,000	14%		
Massingir	24,948	16,717	67%		
Xai-Xai	324,298	30,000	9%		
Inhambane					
Guvuro	30,368	20,000	66%	X	58
Sofala					
Buzi	146,777	70,000	48%	X	64
Chibabava	66,827	5,000	7%	X	63
Machanga	44,304	20,000	45%		
Manica					
Machaze	76,785	5,000	7%		
Mossurize	131,400	3,500	3%		
Sussundenga	107,860	7,000	6%	X	62

*Source: * Estimates of Flood Affected Areas - WFP, 03/08/00*-Maputo

Estimates of household *averages* for different variables are clearly useful, but must also be used carefully. Flood rehabilitation program design needs to be aware of the range of needs and the likely significant differences present among the flood victims. To provide users with an indication of the degree of *variability* in the results for any given Province, many tables also report a breakdown of overall average results for all flood affected areas by tercile of household area cultivated.

As an example, in Table 4, households over the entire flood affected area are estimated to have cultivated some 2.4 hectares in 1996. But when examining this overall average of 2.4 hectares cultivated from the perspective of how much variability is there around this estimated mean value, the table also shows that households in the lowest area cultivated tercile cultivated only about .6 hectares, while those in the highest area cultivated tercile farmed in 1996 some 4.9 hectares. In other words, while the average household cultivated some 2.4 hectares, the bottom 33 percent of households cultivated only .6 hectares, while the top 33 percent of smallholders cultivated 4.9 hectares. Clearly it is important to keep this variation among households in mind when designing flood recovery initiatives.

TABULAR RESULTS

Table 2. Rural Household Demographic Characteristics

Household demographic characteristics	By Province					For All Areas Sampled
	Maputo	Gaza	Inhambane	Sofala	Manica	
Household Size	6.0	7.0	7.0	5.5	7.4	6.4
Gender Structure	------ percent of households ------					
Female headed households	29	20	12	22	14	22
Female population	53	54	51	55	52	53
Age Distribution - People per Age group...	------ percent of members ------					
0 - 9 years old	25	23	20	30	34	26
10 - 19	27	26	22	26	29	26
20 - 29	16	16	25	18	15	17
30 - 39	9	10	14	8	7	9
40 - 49	9	8	9	8	8	8
50 - 59	7	7	5	6	4	6
60 years old or more	8	10	6	4	3	7
Dependency Ratio (<15 + >60)/(>14 & <61)	1.03	1.06	0.69	1.05	1.26	1.04
Have the Household ever moved? (% yes)	20	29	14	38	39	28

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 3a. Food Crop Production and Marketing Behavior

Household Food Crop Production and Marketing	By Province					For All Areas Sampled	By Tercile of HH Area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Households that Harvested (all households)	---------- percent of households ----------								
At least one Staple food crop	87	97	98	98	97	94	90	95	97
Maize	84	95	95	93	97	92	87	93	95
Rice	0	5	11	21	4	7	3	9	10
Cassava	8	40	10	30	11	23	17	22	30
Beans	39	72	48	42	41	51	41	54	58
Sorghum/Millet	1	1	75	70	54	27	15	29	38
Sweet Potato	8	13	2	6	16	9	9	10	10
Sesame	3	1	11	7	26	6	2	6	10
Peanuts	34	24	67	36	11	32	25	29	42
Households that Marketed (all households)	---------- percent of households ----------								
At least one Staple food crop	15	30	25	32	49	28	20	24	38
Maize	12	14	10	23	34	17	12	15	22
Rice	0	3	0	1	0	1	0	2	1
Cassava	3	8	0	4	1	4	4	3	6
Beans	0	11	0	11	7	7	7	5	8
Sorghum/Millet	0	0	3	1	9	1	0	0	3
Sweet Potato	1	3	0	1	3	2	2	1	2
Sesame	0	0	2	0	9	1	0	0	3
Peanuts	0	0	14	5	7	3	0	1	8
Average Area Cultivated per Crop	---------- Area cultivated per household among those that harvested the crop ----------								
Maize	1.49	1.80	2.02	1.44	2.49	1.73	0.49	1.18	3.40
Rice	0.41	1.70	0.80	0.76	0.48	0.86	0.32	0.78	1.16
Cassava	0.76	0.94	1.04	0.33	0.48	0.76	0.23	0.46	1.38
Beans (nhemba)	0.76	0.90	0.72	0.37	0.56	0.73	0.22	0.46	1.33
Sorghum/millet	0.37	0.77	1.41	1.22	2.06	1.41	0.38	0.88	2.32
Sweet Potato	0.60	0.35	0.00	0.28	0.57	0.48	0.14	0.33	1.01
Peanuts	0.70	0.99	1.08	0.38	0.77	0.78	0.22	0.55	1.35

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 3b. Cash Crop Production and Marketing Behavior

Household Cash Crop Production and Marketing	By Province					For All Areas Sampled	By Tercile of HH Area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Households that Harvested				----------	percent of households	----------			
(Among all Households)									
At least one cash crop	11	57	29	39	26	34	28	36	39
Cashew	10	51	19	32	0	27	23	29	28
Coconut	0	2	10	9	0	3	2	4	3
Cotton	0	0	3	2	2	1	0	0	2
Sunflower	0	0	0	2	8	1	0	1	2
Sugar cane	0	4	0	0	16	3	1	4	3
Mafurra	3	24	0	0	0	8	8	8	10
Tobacco	0	0	2	0	2	0	0	0	1
Households that Marketed				----------	percent of households	----------			
(Among all Households)									
At least one cash crop	2	34	7	17	2	15	12	16	18
Cashew	2	33	2	16	0	14	12	15	16
Coconut	0	1	0	1	0	0	0	0	1
Cotton	0	0	3	2	2	1	0	0	2
Sunflower	0	0	0	0	0	0	0	0	0
Sugar cane	0	0	0	0	0	0	0	0	0
Mafurra	0	3	0	0	0	1	1	1	0
Tobacco	0	0	3	0	0	0	0	0	0

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 3c. Fruit Crop Production and Marketing Behavior

Household Fruit Crop Production and Marketing	By Province					For All Areas Sampled	By Tercile of HH Area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Households that Harvested (Among all Households)	---------- percent of households ----------								
At least one fruit crop	23	59	22	50	68	44	39	43	49
Banana	4	10	2	5	32	8	5	9	11
Mango	18	37	19	46	53	33	29	32	37
Orange	3	16	0	5	13	8	7	9	8
Lemon	8	15	0	4	11	9	8	10	9
Grapefruit	1	6	0	3	2	3	1	3	4
Avocado	4	0	0	0	18	3	2	2	4
Papaya	5	15	3	11	18	10	9	10	11
Tangerine	1	7	3	1	6	3	3	3	4
Other	5	6	3	4	11	6	4	8	6
Households that Marketed (Among all Households)	---------- percent of households ----------								
At least one fruit crop	7	20	2	6	29	12	11	10	17
Banana	3	4	0	2	16	4	2	4	6
Mango	4	8	2	2	10	5	5	2	9
Orange	1	4	0	0	3	2	2	1	2
Lemon	1	6	0	0	0	2	3	2	1
Grapefruit	1	3	0	2	0	1	0	1	2
Avocado	1	0	0	0	5	1	1	0	1
Papaya	0	2	0	2	2	1	1	1	1
Tagerina	0	2	0	0	2	1	0	0	1
Other	1	0	0	0	3	1	1	0	0

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 3d. Vegetable Crop Production and Marketing Behavior

Household Vegetable Crop Production and Marketing	By Province					For All Areas Sampled	By Tercile of HH Area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Households that Harvested (Among all Households)	---------- percent of households ----------								
At least one Vegetable crop	8	17	14	20	66	20	13	20	27
Lettuce	3	8	0	2	6	4	4	5	3
"Couve"	4	6	3	4	41	8	4	10	10
Onion	4	6	7	7	17	7	5	7	9
Tomato	2	6	14	13	20	8	5	7	13
Pumpkin	2	2	5	3	14	4	1	3	6
Garlic	2	4	2	2	12	3	2	5	3
“Inhame”	0	0	0	0	23	2	0	2	5
Other Vegetables	1	1	2	4	23	4	1	4	6
Households that Marketed (Among all Households)	---------- percent of households ----------								
At least one Vegetable crop	3	8	10	6	44	10	6	10	13
Lettuce	2	3	0	0	5	2	3	1	1
"Couve"	1	2	0	3	27	4	2	4	6
Onion	1	3	3	3	12	3	3	3	4
Tomato	1	3	10	4	11	4	2	4	6
Pumpkin	0	0	0	1	0	0	0	0	0
Garlic	0	1	0	1	5	1	0	0	1
“Inhame”	0	0	0	0	14	1	0	2	2
Other Vegetables	1	0	0	0	16	2	1	2	2

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 4. Household Land Holdings Characteristics

	By Province					For All Areas	By Tercile of HH Area Cultivated		
	Maputo	**Gaza**	**Inhambane**	**Sofala**	**Manica**	**Sampled**	**1**	**2**	**3**
Mean Area Cultivated (hectares) per …									
Household	1.96	2.47	2.72	2.33	3.34	2.40	0.6	1.66	4.88
Person (per capita)	0.38	0.42	0.47	0.46	0.51	0.43	0.15	0.37	0.77
Labor adult equivalent	0.58	0.65	0.69	0.75	0.88	0.67	0.23	0.55	1.24
Households with … hectares			---------- percent of households ----------						
0.00	3	0	2	1	0	1			
0.01 - 0.24	6	5	0	2	0	3			
0.25 - 0.49	13	2	9	2	2	6			
0.50 - 0.99	19	16	17	10	5	15			
1.00 - 1.99	27	28	17	39	29	29			
2.00 - 3.99	16	24	36	30	32	25			
4.00 - 9.99	14	25	16	14	26	19			
10.00 or more	2	1	3	2	6	2			
Household Field Location and Area Cultivated									
			---------- percent of households ----------						
Households with at least one field in “Baixa”	60	55	5	50	53	51	48	52	52
Households with at least one field in “Alta”	58	53	100	78	71	66	57	66	73
Households with Fields in “Both Areas”	22	8	5	29	24	18	9	19	25
			---------- mean area per Household ----------						
Mean HH Area Cultivated in “Zona Baixa” (ha)	1.56	2.16	1.48	1.47	2.56	1.84	0.57	1.26	3.61
Mean HH Area Cultivated in “Zona Alta” (ha)	1.71	2.45	2.65	2.04	2.79	2.22	0.58	1.47	4.11

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 5. Household Livestock Holding Characteristics

Livestock Ownership	By Province					For All Areas Sampled	By Tercile of HH Area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Households with …	---------- percent of households ----------								
Cows	5	15	10	4	31	11	3	10	18
Goats	24	35	47	43	45	35	24	31	51
Lamb	2	2	2	0	2	1	0	0	4
Hogs	4	17	5	6	2	8	5	8	12
Chicken	55	56	86	89	77	67	59	69	74
Ducks	29	30	31	21	13	26	21	27	30
Other "birds"	1	3	0	2	5	2	0	2	3
Rabbits	1	12	0	0	0	4	3	4	5
Other animals	2	2	0	0	0	1	1	2	0
Mean Number of Animals, Among Those	---------- mean number per household ----------								
Who Have …									
Cows	5	8	24	6	8	9	4	7	10
Goats	9	5	19	8	6	8	5	7	11
Lamb	2	11	1		10	7	0	5	8
Hogs	4	5	20	5	1	6	6	4	7
Chicken	10	11	16	16	17	13	9	12	17
Ducks	5	6	6	5	10	6	5	6	6
Other "birds"	60	26	-	6	10	21	5	28	20
Rabbit	17	6	-	-	-	7	5	7	9
Other animals	6	11	-	-	-	9	6	9	12

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 6. Household Income Diversification Characteristics

Household Income Diversification Strategies	By Province					For All Areas Sampled	By Tercile of HH Area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Supply of Labor Off-household Farm				----------	percent of households	----------			
Households selling labor off-hh farm	12	31	33	22	27	24	22	23	26
Primarily Farm Labor	6	13	18	11	8	11	15	9	9
Primarily Non-farm Labor	6	20	15	12	20	14	11	14	17
Ownership of Off-farm Businesses									
Households with non-farm business (%)	57	31	43	43	60	45	40	45	52
Mean number of off-farm businesses (among those who have at least one)	1.9	1.5	1.4	1.2	1.4	1.6	1.5	1.7	1.6
Businesses owned by women (%)	48	31	17	51	42	42	46	42	39
Businesses owned by men (%)	52	69	83	49	58	58	54	58	61
Mean age of businesses owners (all)	33	38	34	34	36	35	35	34	35
Mean age (female owners)	31	34	29	29	33	31	30	34	30
Mean age (male owners)	35	40	36	40	38	37	40	35	38

Source: Trabalho de Inquerito Agricola ao Sector Familiar, 1996

Table 7. Household Ownership of Basic Agricultural Implements

Asset Ownership	By Province					For All Areas Sampled	By Tercile of HH area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Households with …	---------- percent of households ----------								
Hoe	64	100	98	99	97	88	83	90	91
Axe	60	93	95	85	86	81	77	79	87
Machete	49	85	74	70	86	70	64	68	77
Shovel	30	72	16	9	23	37	32	35	43
Rake	16	57	21	6	17	27	21	27	32
Sickle	24	61	40	34	47	41	35	40	47
File	10	37	16	14	19	20	15	17	29
Harrow	13	38	24	2	39	22	11	23	32
Mean Number Among Those Who Have ...	---------- mean number per household ----------								
Hoe	3	4	5	4	4	4	3	4	5
Axe	2	2	3	1	2	2	2	2	2
Machete	1	1	2	1	2	1	1	1	1
Shovel	1	1	2	1	1	1	1	1	1
Rake	1	1	2	1	1	1	1	1	1
Sickle	1	2	2	2	2	2	1	2	2
File	1	1	1	2	2	1	1	1	2
Harrow	2	2	2	1	2	2	1	2	2

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

Table 8. Household Tree Ownership Patterns

Household Tree Ownership	By Province					For All Areas Sampled	By Tercile of HH Area Cultivated		
	Maputo	Gaza	Inhambane	Sofala	Manica		1	2	3
Households that Report Having Trees (Among all Households)	---------- percent of households ----------								
At least one type of fruit tree	33	81	56	75	76	62	54	64	69
Cashew tree	12	60	47	63	2	39	31	43	44
Coconut tree	1	10	17	7	0	6	5	5	9
Mafurreira	4	37	2	0	0	13	13	11	14
Banana tree	4	14	3	6	32	10	3	13	14
Mango tree	20	43	29	65	68	41	33	44	47
Orange tree	6	22	7	7	24	13	11	14	14
Lemon tree	8	16	2	5	15	10	9	11	9
Grapefruit tree	1	7	2	5	3	4	1	4	6
Avocado pear tree	9	1	0	0	26	6	6	6	5
Papaya Tree	11	20	3	18	24	16	14	17	17
Tagerine Tree	1	11	7	2	10	6	5	5	7
Other Trees	8	12	7	6	11	9	7	9	11
Mean Number of Trees per Household (Among Those that Have It)	---------- mean number per household ----------								
Cashew tree	5	46	33	54	1	43	27	58	40
Coconut tree	2	9	21	21	0	15	5	13	21
Mafurreira	3	6	4	0	0	6	5	7	6
Banana tree	14	55	19	39	19	36	37	29	42
Mango tree	5	8	5	15	16	11	6	11	14
Orange tree	3	8	11	6	6	7	10	3	8
Lemon tree	3	4	2	3	3	3	3	4	3
Grapefruit tree	6	124	70	197	94	128	110	158	109
Avocado pear tree	4	7	0	0	4	4	4	3	5
Papaya Tree	5	8	7	12	2	8	4	6	12
Tagerine Tree	1	3	4	5	5	3	2	2	4

Source: Trabalho de Inquerito Agricola ao Sector Familiar em Mocambique, 1996

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