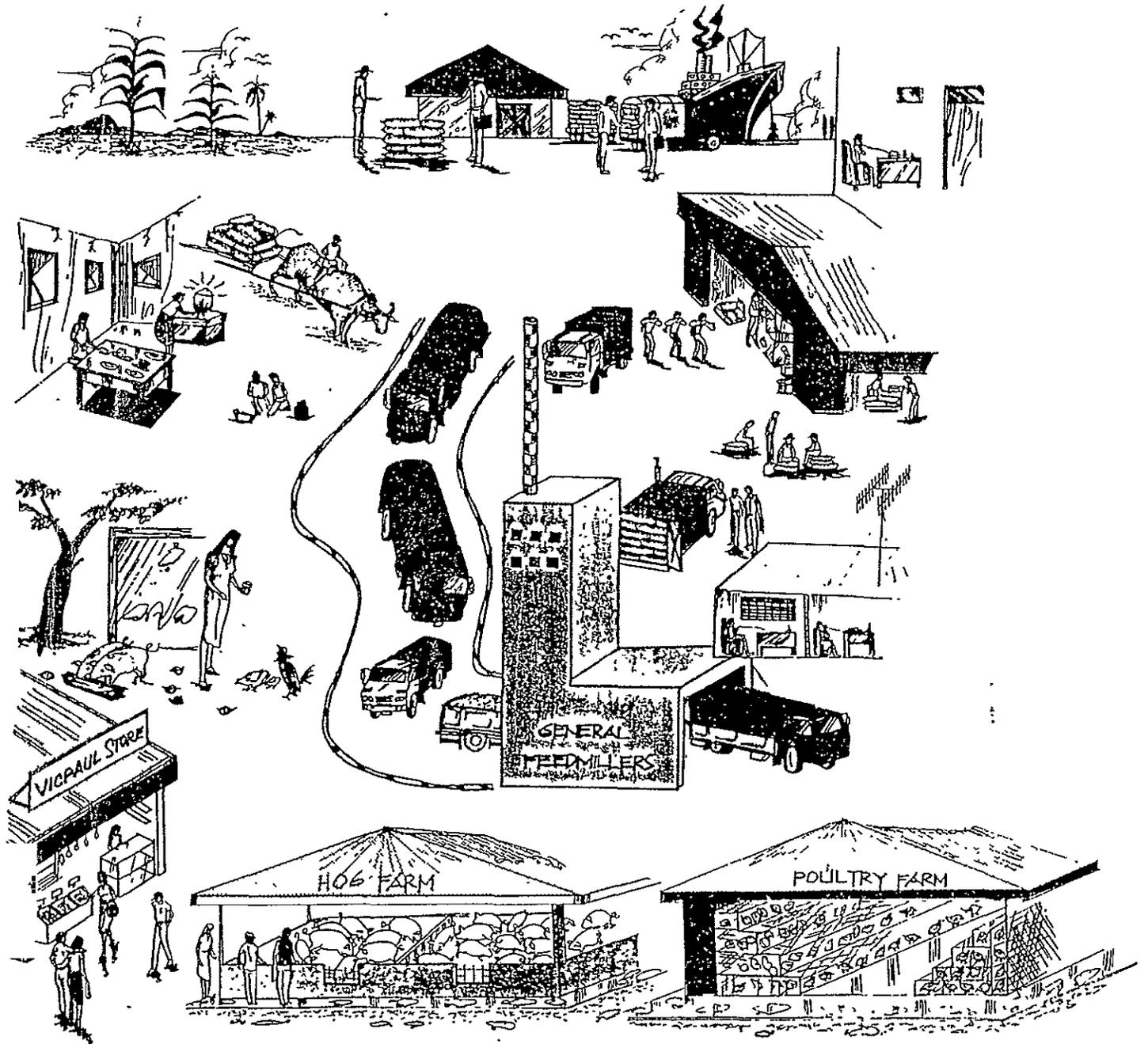


TECHNICAL REPORT

THE CORN MARKETING SYSTEM

A RAPID MARKETING APPRAISAL IN THE NORTHERN MINDANAO REGION

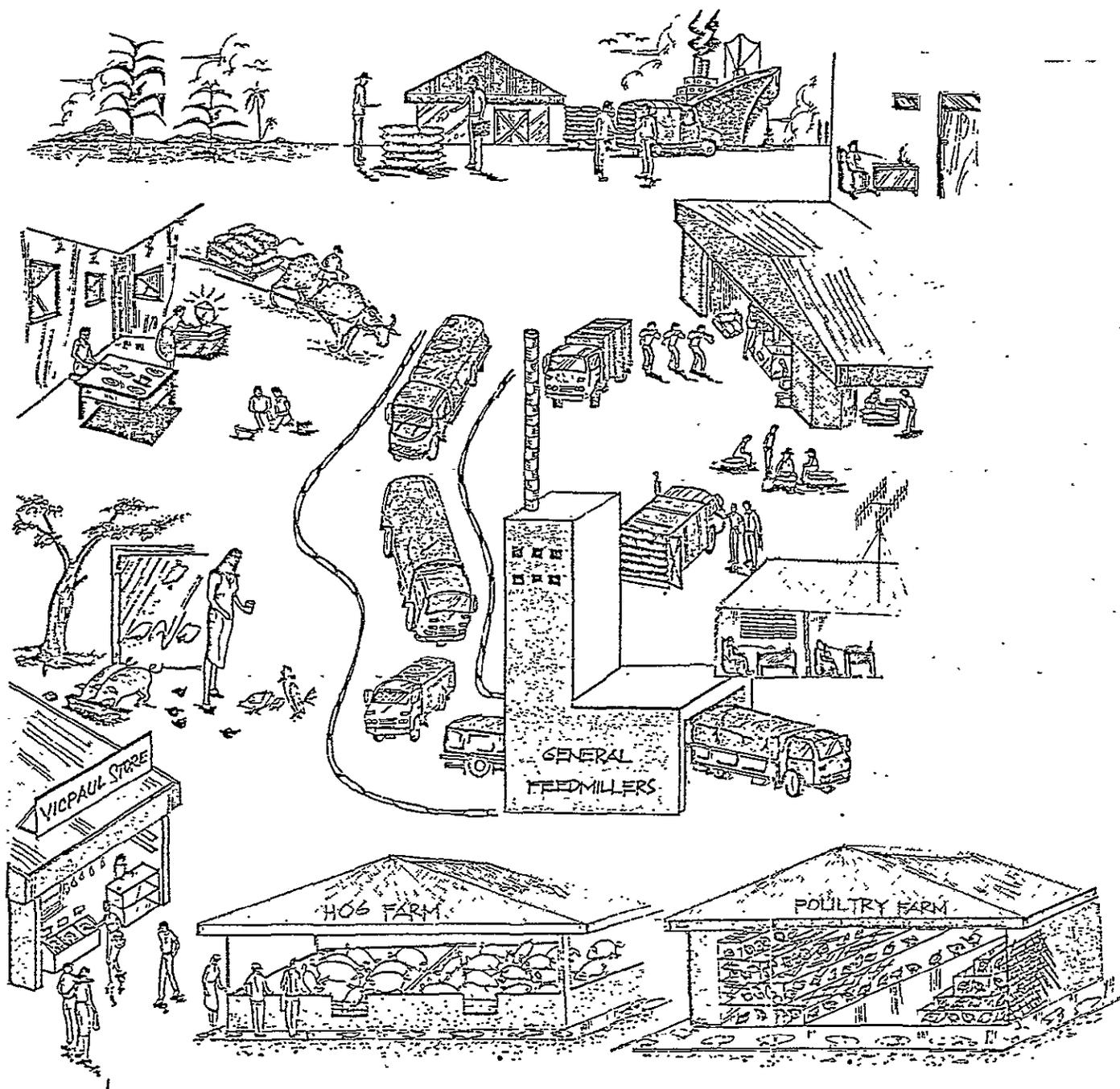


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A Project of the

CAGAYAN DE ORO CHAMBER OF COMMERCE AND INDUSTRY
FOUNDATION, INC.

under the

ACCELERATED AGRICULTURAL PRODUCTION PROJECT
OF THE DEPARTMENT OF AGRICULTURE AND THE
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

PREFACE

This report contains the highlights from the full Technical Report written on this study. The study was conducted by the Cagayan de Oro Chamber of Commerce and Industry Foundation, Inc. (Oro Chamber) as a sub-project under the Department of Agriculture's Accelerated Agricultural Production Project. The United States Agency for International Development provided the grant funds for this study. The NGO-Government partnership in the conduct of this study was aimed at strengthening the mutually supportive roles of both sectors in the promotion and improvement of the vital corn industry and income enhancement for farmers.

The research covered five municipalities as supply sites in Region X and extended to the major demand sites of Cebu and Manila. The fieldwork was conducted during the peak harvests of the first cropping season for corn from August to October, 1989.

The study also presents an "Agenda for Action and Research" which consists of possible approaches addressing the problems/constraints identified within Region X's corn marketing system.

ACKNOWLEDGMENT

The Board of Trustees of Oro Chamber expresses its gratitude to the members of the Project Core Group for their dedication and commitment accorded this project.

The Chamber also takes pleasure to acknowledge the invaluable help of the Department of Agriculture through their Accelerated Agricultural Production Project (AAPP) and the Region X Office by Director Amante Siapno.

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TABLE OF CONTENTS

	<u>Page</u>
Preface	i
Acknowledgments	ii
EXECUTIVE SUMMARY	1
CHAPTER I. INTRODUCTION	35
A. Objectives	35
B. Research Methodology	37
1. Team Composition	37
2. Implementation Strategy	37
3. Sampling Frame and Coverage	38
C. Limitations	41
CHAPTER II. BACKGROUND: THE CORN NATIONAL SITUATION	42
A. Importance of Corn	42
B. Supply Trends	43
1. Production Volume, Area and Yield	43
2. White versus Yellow Corn Production	43
3. Geographic Location of Supply	44
C. Demand Patterns	44
1. Food versus Feed Use	44
2. Geographic Location of Demand	44
3. Income Elasticity of Demand	44
D. Related Issues	47
1. Crop Seasonality	47
2. Inadequate Domestic Supply	47
3. No Improvement in Real Prices of Corn	47
4. Low Production Performance in 1989	47
5. Rising Demand for Feeds	50
6. Unusuality in the 1989 Price Behavior	50
7. Sharp Increase in Imports	52
8. Inter-Island Transportation System	52
9. Government Intervention	52
CHAPTER III. CROP AND COMMODITY CHARACTERISTICS AT RESEARCH SITES	54
A. Supply Areas	55
1. Northern Mindanao	55
2. Characteristics of the Sample Supply Areas	55

3.	Barangays	64
4.	Farmers /Crops	65
B.	Demand Areas	73
1.	Northern Mindanao	73
2.	Cebu	78
3.	Manila	80
CHAPTER IV.	MARKETING SYSTEM ORGANIZATION	81
A.	Participants	82
1.	Northern Mindanao	82
2.	Cebu	95
B.	Spatial Network	99
1.	Geographical Flow	99
2.	Trading Pattern	109
C.	Market Entry and Competition	111
1.	Market Entry	111
2.	Competition	114
D.	Product Differentiation	115
1.	"Wet," "Half-Dry," and "Dry Corn"	115
2.	Brand Names of Grits	115
CHAPTER V.	MARKETING SYSTEM OPERATION	116
A.	Marketing Functions	116
1.	Physical Functions	117
2.	Exchange Functions - "Buying and Selling"	124
B.	Support Services	125
1.	Market Information	125
2.	Credit	129
C.	Behavior	131
CHAPTER VI.	ECONOMICS	134
A.	Pricing System	135
1.	Price Formation	135
2.	Price Differences Between Location	136

3.	Price Seasonality	138
4.	Price Behavior	138
5.	Prices Difference by Form or Substitute	144
B. Costs/Returns		144
1.	Costs/Returns to Corn Production	149
2.	Traders' Marketing of Grain	154
3.	Costs and Comparative Advantage Between Millers in CDO and Cebu	159
CHAPTER VII. INFRASTRUCTURE		164
A. Road Network		165
1.	Condition of Roads and Bridges	165
2.	Modes of Transport	166
B. Shipping Patterns		171
1.	Port and Shipping Facilities	171
2.	Corn Transshipment	171
3.	Conditions of Cebu City Port	175
C. Post-Harvest Facilities		175
1.	Dryers	175
2.	Shellers	176
3.	Storage and Warehouses	176
D. Communication		178
E. Power		179
CHAPTER VIII. INSTITUTIONS AND POWER		180
A. National Institutions		180
1.	Government Sector	181
2.	Private Sector	184
B. Local Institutions		185
1.	Government Sector	185
2.	Private Sector	187
3.	Development NGOs	188
C. "Forces" Within the System		189

CHAPTER IX.	PROBLEM AND CONSTRAINTS	190
	A. Problems Cited by Participants	191
	1. Production Level	191
	2. Distribution Level	193
	3. Processing Level	198
	4. Consumption Level	206
	B. Vertical Linkages	213
	C. Problems Regarding Marketing Flows	214
	1. Commodity Flow	214
	2. Money Flow	215
	3. Information Flow	215
	D. System Performance	216
CHAPTER X.	SPECIAL CASE STUDY: THE HOG INDUSTRY IN REGION X	219
	A. Overview	219
	1. Industry Locations and Trends	219
	2. Feed and Procurement	220
	3. Internal Operations	220
	4. Sales	221
	5. Institutions	221
	B. Main Causes for Poor Performance	223
	C. The "Appraisal Wheel" for Hog Raisers	223
	1. Location	223
	2. Financing	226
	3. Structure and Layout Design	226
	4. Management	227
	5. Breeding Stock	229
	6. Feed Preparation and Nutrition	230
	7. Marketing	232
	D. Key Factors Per Stage of Sow, Boar and Hog Growth Patterns	234
	E. Problems /Opportunities	234
	F. Agenda For Action and Research	241
	1. Laboratory and Building Centers	241
	2. Production and Utilization of Substitute for Corn and Protein Ingredients	242
	3. Processing of Frozen Meats and Meat Products (Packed or Canned)	242
	4. Establishment of More Marketing Outlets	242

LIST OF FIGURES

Figure	Description	Page
1.1	The Philippines: Research Sites	36
1.2a	Distribution of RMA Interviews by Type of Respondent per Sample Site in Northern Mindanao, October, 1989	39
1.2b	Distribution of RMA Interviews by Type of Respondent per Sample Site in Cebu, October, 1989	40
2.1	Major Corn Producing Provinces and Location of Livestock-Based Processing Firms and Feedmills	45
2.2	Regional Distribution of Corn Production and Mixed Feeds	46
2.3	Wholesale and Farmgate Prices of Corn, July 1985 - April 1989	48
2.4	Annual National Trends in Nominal and Real Wholesale Prices of Yellow and White Corn, 1980-1989	49
2.5	National Real Wholesale Prices of Corn, 1980-1989	51
2.6	Volume of NFA Corn Imports, 1980-1989	53
3.1	Corn Production Areas of RMA Sites in Region X, December, 1989	57
3.2	Topographical Map of Key Corn Production Areas in Bukidnon Province According to Elevation	58
3.3a	Rainfall Pattern and Corresponding Cropping Pattern Claveria, Misamis Oriental	60
3.3b	Rainfall Pattern and Corresponding Cropping Pattern of Malaybalay, Bukidnon	61
3.3c	Rainfall Pattern and Corresponding Cropping Pattern of Wao, Lanao del Sur	62
3.4	Major Supply and Demand Areas as Research Sites	76
4.1	Flow of Corn from Northern Mindanao by Type of Buyer and Location	85
4.2	Location of Piggeries, Production Capacities and Market Distribution	94
4.3	Flow of Corn from Bukidnon to Cagayan de Oro City	101
4.4	Flow of Corn from Cagayan de Oro City to Cebu City and other Demand Areas	102
4.5	Yearly Outflow of White Corn Grains from Cagayan de Oro City, 1986-1989	103
4.6	Yearly Outflow of Yellow Corn Grains from Cagayan de Oro City, 1986-1989	104
4.7	Yearly Outflow of White Corn Grits from Cagayan de Oro City, 1986-1989	105
4.8	Yearly Inflow of White Corn Grains to Cebu City, by Source, 1985-1989	106
4.9	Yearly Inflow of Yellow Corn Grains to Cebu City, by Source, 1985-1989	107
4.10	Yearly Inflow of White Corn Grits to Cebu City, by Source, 1985-1989	108

4.11	Market Flow of Hogs from Bukidnon to Cagayan de Oro City and Manila	110
6.1	Monthly Average Wholesale Prices of White and Yellow Corn Grains in Malaybalay, Bukidnon, 1984-88 & 1989	141
6.2a	Average Monthly Prices of White and Yellow Corn Grains in Cagayan de Oro City, 1984-1989	142
6.2b	Average Monthly Prices of White and Yellow Corn Grains in Cagayan de Oro City, 1984-88 & 1989	143
6.3	Impact of Importation on Buying Prices of Corn in Cagayan de Oro City, July - December, 1989	145
6.4	Average Monthly Prices of White Corn Grains and Grits in Cagayan de Oro City, 1984-88 & 1989	146
6.5	Average Monthly Prices of White Corn Grains and Grits, Cebu City, 1984-88 & 1989	147
6.6	Monthly Average Retail Prices of Regular Milled Rice (RMR) and White Corn Grits (WCT), Cebu City, 1984-88 and 1989	148
7.1	Distances from Cagayan de Oro City and Mode of Transportation within the Research Sites	167
7.2	Trucking Cost of Corn from Research Sites to Cagayan de Oro City, First Cropping Season, 1989	168
7.3	Flow of Corn Commodities From Supply Areas Through Cagayan de Oro To Demand Areas, 1988-1989	172
7.4	Volume of Corn Outflow vs. Volume of Domestic Outbound Cargo in Cagayan de Oro Port, 1989	174
10.1	The Hog Raiser's "Appraisal Wheel"	224
10.2	Illustration of the Hybrid Process	231

LIST OF TABLES

Table	Description	Page
3.1	Profiles of Target Municipalities in Northern Mindanao and Wao, Lanao del Sur	59
3.2a	Barangay Profile of Sample Barangays in Claveria, Misamis, Oriental	66
3.2b	Barangay Profile of Sample Barangays in Malaybalay, Don Carlos and Kalilangan, Bukidnon	67
3.2c	Barangay Profile of Sample Barangays in Wao, Lanao del Sur	68
3.3a	Yield Comparison between Yellow Hybrid and OPV White Corn Farmers, First Cropping Season, 1989	70
3.3b	Yield Comparison between Farmers by Location of Farms, First Cropping Season, 1989	71
3.3c	Yield Comparison between Farmers According to Size of Farm, First Cropping Season, 1989	72
3.4	Technical Characteristics of Open-pollinated (OPV) vs. Hybrid Varieties	74
3.5	Preferences For Specific Brands of Yellow Hybrid Varieties and Yield Performance By Location, First Cropping Season, 1989	75
3.6	Profile of Cagayan de Oro and Cebu City	79
4.1	Corn Shippers in Cagayan de Oro City and Bukidnon, by Type of Ownership and Generation of Manager	89
4.2	Management Patterns of Firms Interviewed in all Supply and Demand Areas	90
4.3a	Market Entry of Marketing System Participants in Supply Area (Northern Mindanao)	112
4.3b	Market Entry of Marketing System Participants in Demand Area (Cebu)	113
5.1	Marketing Functions Performed by Marketing Participants in the Supply and Demand Areas	118
5.2	Farmers' Potential Loss per Bag of Grains due to Selling Semi-wet or Wet Corn in Different Locations, First Cropping Season, 1989	122
5.3	Sources of Price Information for Sample Farmers by Location, First Cropping, 1989	126
5.4a	Sources of Price Information for Sample Traders by Type and Location, First Cropping Season, 1989	127
5.4b	Sources of Price Information of Sample Traders in Cagayan de Oro City, by Type, First Cropping Season, 1989	128
5.5	Terms of Credit for Sample Farmers Growing Hybrid Yellow vs. White Corn Varieties by Location, First Cropping Season, 1989	130
5.6	Traders' Sources of Capital by Type and Location, First Cropping Season, 1989	132

6.1	Prevailing Corn Prices at Sample Sites Relative to Cagayan de Oro Price at the same point in time (August, 1989)	137
6.2a	Average Monthly Buying Prices for White Corn Within the Corn System, First Cropping Season, 1989	139
6.2b	Average Monthly Buying Prices for Yellow Corn at Three Buying Centers within the Corn System, First Cropping Season, 1989	140
6.3	Comparative Costs and Returns per Hectare of Yellow Hybrid and White Corn Farmers in Sample Barangays, First Cropping Season, 1989	150
6.4	Farmgate vs. Ex-Farm Costs and Returns of Yellow Hybrid and White Corn Farmers in Sample Barangays, First Cropping Season, 1989	155
6.5	Post-Harvest and Marketing Costs per Activity from Four Supply Sites to Cebu Port, First Cropping Season, 1989	157
6.6	Case 1: Dump Spoiled Corn and Sell Only Good Quality Corn (Option A) vs. Mix and Sell Spoiled with Good Quality Corn (Option B)	160
6.7	Case 2: Dry Wet Corn Using Either a Mechanical or Solar Dryer and Sold at 14% MC (Option A) vs. Mix and Sell Wet and Dry Corn Corn Grains (Option B)	161
6.8	Comparative Costs of Milling by Location (per 100 kg), August, 1989	162
7.1	Distance, Travel Time, and Trucking Cost for Corn Grain Transported from Sample Sites to Cagayan de Oro City, First Cropping Season, 1989	170
7.2	Types, Number, GRT, Routing and Corn Capacity of Vessels Calling on Cagayan de Oro City Port, 1989	173
7.3	Characteristics and Comparative Cost per Kilogram of Mechanical Dryers	177
9.1	Problems Perceived by Sample Corn Farmers, 1989	192
9.2	Problems Perceived by Sample Traders at Barangay, Municipal, and Provincial Sites, 1989	195
9.3	Problems Perceived by Sample Trader/Shippers in Cagayan de Oro City, 1989	197
9.4	Problems Perceived by Sample Cebu Trader/Shippers regarding the Corn Commodity System, 1989	199
9.5	Problems Perceived by Sample Custom Millers in Northern Mindanao, 1989	199
9.6	Problems Perceived by Sample Commercial Corn Millers in Region X, 1989	201
9.7	Problems Perceived by Sample Commercial Corn Millers in Cebu, 1989	203
9.8	Problems Perceived by Sample Feedmillers in Cagayan de Oro and Cebu, 1989	205

9.9	Problems Perceived by Sample Backyard and Commercial Hog Raisers in Region X, 1989	207
9.10	Problems Perceived by Sample Backyard and Commercial Hog Raisers in Cebu, 1989	210
9.11	Problems Perceived by Sample Poultry Growers in Northern Mindanao and Cebu, 1989	212
10.1	Key Factors Per Stage in the Sow Growth Patterns	235
10.2	Key Factors Per Stage Within the Boar Growth Patterns	236
10.3	Key Factors Per Stage of Hog Growth Patterns	237
10.4	Opportunities Per Stage in the Sow Productivity Cycle by Type of Interest Group	238
10.5	Opportunities for Improvement in the Boar Growth Patterns by Type of Interest Groups	239
10.6	Opportunities for Improvement in the Hog Growth Patterns by Types of Interest Groups	240

LIST OF ATTACHMENTS AND THEIR TABLES,
CHARTS, FIGURES AND LIST

<u>Attachment</u>	<u>Description</u>	<u>Page</u>
A	Agricultural Marketing Assessments: An Overview	243
	Table 1 - Phased Research Design and Implementation	244
	Chart 1 - Illustration of System Participants in an Agricultural Production-Distribution- Processing-Consumption System	246
	Chart 2 - Assessment Wheel	247
	Table 2 - Framework For Marketing Assessment	248
	Table 3 - Features of Marketing Assessment	249
B	Implications of the Conversion of Corn Land to Sugarcane Areas in Bukidnon	251
	Table 1 - Sugarcane Area and Production Estimates in Bukidnon	252
C	Brief Review of the Hybrid Corn Industry in Bukidnon	253
	Figure 1 - Distribution Channel For Pioneer Hybrid Seeds, 1989	255
	Figure 2 - Distribution Channel For SMC Seeds, 1989	255
	Figure 3 - Distribution Channel For Cargill Seeds, 1989	256
D	Overview of Input Dealers in Region X	257
	Figure 1 - Market Entry of Input Suppliers by Type	258
	Table 1 - Sampling Frame for Input Suppliers in Region X	259
	Table 2 - Input Dealers' Selling Prices of Hybrid Corn Seeds by Brand and Location, August - September, 1989	262
	Table 3 - Fertilizer Selling Prices of Cagayan de Oro Input Dealers According To Company and Grade, September, 1989	262
	Table 4 - Fertilizer Prices by Brand, Grade and Location, August - September, 1989 (Pesos/Bag)	263
	Table 5 - Costs of Transporting Inputs from Suppliers to Buyers Locations, August - September, 1989	264
	Table 6 - Problems of Input Dealers	265
E	Implications of NFA Support Price	267
	Figure 1 - Marketing Costs in Moving Corn from Aglayan, Malaybalay to Cebu and Manila based on Actual Buying Price for Corn	268

	Figure 2 - Marketing Costs in Moving Corn from Milaya, Wao, Lanao-del Sur to Cebu and Manila based on Actual Buying Price for Corn	269
	Table 1 - A Scenario of Detailed Marketing Costs based on Actual Buying Price of Corn in Barangays of Two Supply- Areas to Cebu and Manila	270
F	Shipping Sector Report	273
	Figure 1 - Domestic Cargo --CDO & Cebu-Ports (Containerized and Non-Containerized)	275
	Table 1 - Shipping Lines Servicing Cagayan de Oro by Type and Number of Vessels	276
	Table 2 - Cost of Shipping Corn from Cagayan de Oro Port to Cebu, by Type of Cargo	278
	Table 3 - Port Traffic and Cargo Statistics, CDO Base Port	281
	Table 4 - Problems Mentioned By The Shipping Companies	282
	Table 5 - Problems Mentioned By Shippers	282
	Table 6 - Problems Mentioned By Cargo Handling Contractors	283
	Table 7 - Problems Mentioned By Hog Raisers	283
	List of Terms	284

LIST OF APPENDICES

<u>Appendix</u>	<u>Description</u>	<u>Page</u>
1	Institutional Dimensions of the Region X Rapid Marketing Appraisal for Corn	285
2a	Sampling Frame of Marketing Participants in Northern Mindanao & Cebu - Farmers & Traders	286
2b	Sampling Frame of Marketing Participants in Northern Mindanao & Cebu - Processors & End-users	287
2c	Sampling Frame of Marketing Participants in Northern Mindanao & Cebu - Other Marketing Participants	288
3	Percentage Share of Corn in National Foodgrain Area and Crop Harvest Area, 1980-1987	289
4	Gross Value Added (GVA) in Agricultural Crops (At constant 1972 prices) and Share to Gross National Product (GNP), Philippines, 1980-1989	290
5	National Production, Area, and Yield of White and Yellow Corn, 1980-1989	291
6	Regional Distribution of Corn Production, 1980-1989	291
7	National Supply and Demand of Corn, 1980-1987	292
8	Regional Distribution of Corn Area, 1980-1989	293
9	NFA Monthly White and Yellow Corn Importation, Philippines, 1980-1989	294
10a	Population Projections, Density, Annual Growth Rate and Migration Trends by Province, 1985-1989 - Population Projection by Provinces	295
10b	Population Projections, Density, Annual Growth Rate and Migration Trends by Province, 1985-1989 - Population Density by Province	295
10c	Population Projections, Density, Annual Growth Rate and Migration Trends by Province, 1985-1989 - Population Projections Annual Growth Rates	295
10d	Population Projections, Density, Annual Growth Rate and Migration Trends by Province, 1985-1989 - Migration Trends by Province, 1975-1980	295
11	Provincial Distribution of Corn Production in Northern Mindanao, 1980-1989	296

12	Rainfall Pattern and Corresponding Cropping Pattern of Don Carlos, Bukidnon	297
13	Rainfall Pattern and Corresponding Cropping Pattern of Kalilangan, Bukidnon	298
14	Agro-climatic Factors Conditioning Corn Production of Sample Farmers, by Barangay, First Cropping Season, 1989	299
15a	Flow of Corn from Barangay Hinaplanan and Ane-i, Claveria, Misamis Oriental	300
15b	Flow of Corn from Barangay Magsaysay and Aglayan, Malaybalay, Bukidnon	301
15c	Flow of Corn from Barangay New Visayas and Pualas, Don Carlos, Bukidnon	302
15d	Flow of Corn from Barangay Kibaning and Lampanusan, Kalilangan, Bukidnon	303
15e	Flow of Corn from Barangay Milaya and Katutungan, Wao, Lanao del Sur	304
16	Yearly Outflow of Corn Grains and Grits from Cagayan de Oro to Cebu, Manila and Other Demand Areas, 1986-1989	305
17a	1986 Monthly Outflow of Corn Grains and Grits from Cagayan de Oro to Specific Destinations, 1986-89	306
17b	1987 Monthly Outflow of Corn Grains and Grits from Cagayan de Oro to Specific Destinations	307
17c	1988 Monthly Outflow of Corn Grains and Grits from from Cagayan de Oro to Specific Destinations	308
17d	1989 Monthly Outflow of Corn Grains and Grits from from Cagayan de Oro to Specific Destinations	309
18	Yearly Inflow of Corn Grains and Grits to Cebu City, by Source, 1985-1989	310
19a	1985 Monthly Inflow of Corn Grains and Grits to Cebu City by Specific Sources	311
19b	1986 Monthly Inflow of Corn Grains and Grits to Cebu City by Specific Sources	312
19c	1987 Monthly Inflow of Corn Grains and Grits to Cebu City by Specific Sources	313

19d	1988 Monthly Inflow of Corn Grains and Grits to Cebu City by Specific Sources	314
19e	1989 Monthly Inflow of Corn Grains and Grits to Cebu City by Specific Sources	315
20a	Shelling and Drying Facilities Owned by Sample Grain Traders (Barangay, Municipal and Provincial) in Bukidnon Province, Wao, Lanao del Sur and Claveria, Misamis Oriental	316
20b	Trucking and Storage Facilities Owned by Sample Grain Traders (Barangay, Municipal and Provincial) in Bukidnon Province, Wao, Lanao del Sur and Claveria, Misamis Oriental	317
21	Number of Solar Dryers Owned by Type of Traders in RMA Sites	318
22	Monthly Average Wholesale Prices of White and Yellow Corn Grains in Malaybalay, Bukidnon, 1984-88 & 1989	319
23	Monthly Average Prices of White & Yellow Corn Grains in Cagayan de Oro, 1984-1989	320
24	Monthly Average Prices of White Corn Grains and Grits in Cagayan de Oro, 1984-1988 & 1989	321
25	Monthly Average Prices of White Corn Grains and Grits in Cebu City, 1984-1988, and 1989	322
26	Monthly Average Retail Prices of Regular Milled Rice (RMR) and White Corn Grits (WCT), Cebu City, 1984-88 and 1989	323
27	Illustrative Calendar of Activities and Cultural Practices for Growing Hybrid Corn	324
28	Comparative Cost of Labor in Sample Barangays, First Cropping Season, 1989	325
29a	Comparative Cost of Production per Hectare of Yellow Hybrid and White Corn Farmers in the Sample Barangays, First Cropping Season, 1989 - Farmers in Claveria and Malaybalay	326
29b	Comparative Cost of Production per Hectare of Yellow Hybrid and White Corn Farmers in the Sample Barangays, First Cropping Season, 1989 - Farmers in Don Carlos and Kalilangan	328
29c	Comparative Cost of Production per Hectare of Yellow Hybrid and White Corn Farmers in the Sample Barangays, First Cropping Season, 1989 - Farmers in Wao and Average for the 5 Municipalities Covered	330

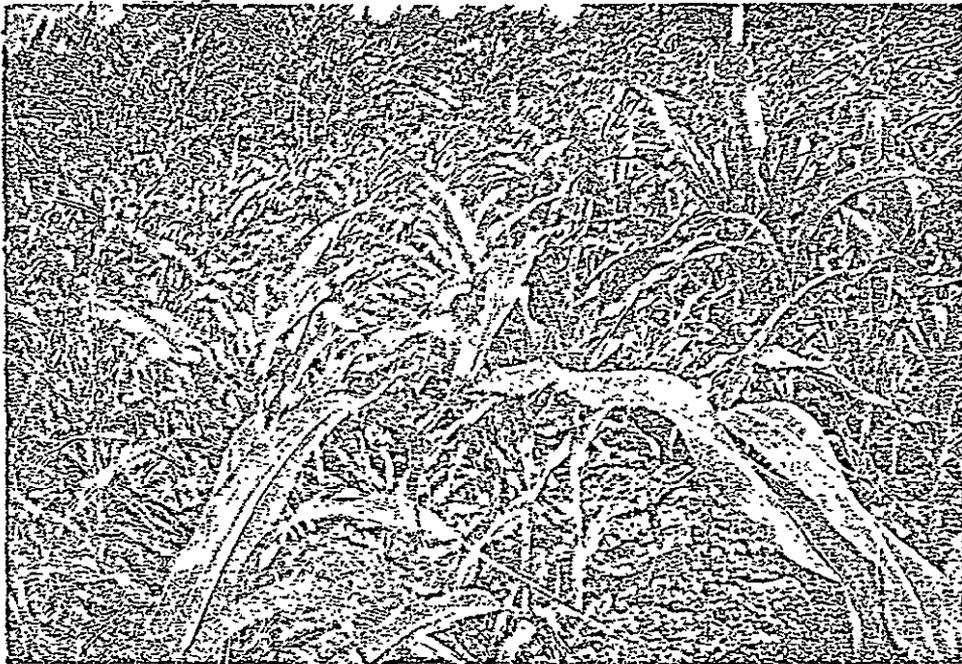
30a	Registered Trucking Services for Rice and Corn in Bukidnon Province, by Municipality	331
30b	Registered Corn Shellers in Bukidnon Province by Municipality	332
30c	Registered Corn and Rice Warehouses in Bukidnon Province by Municipality	333
31	Location Map of NFA Warehouses and Buying Stations	334
32a - 32f	National Institutions Affecting the Corn Industry and their Functions	335
33	Total Corn Procurement of the National Food Authority, 1987-1989	341
34	NFA Requirements for Licensing Business Establishment in Grains	342
35a - 35h	Local Institutions (Regional, Provincial, Municipal) Affecting the Corn Industry in Northern Mindanao	346
36	Land Bank of the Philippines' Checklist of Requirements for Crop Loan Application	354
37	Problems Perceived by Hybrid Yellow Corn vs. White Corn Farmers by Barangay, First Cropping Season, 1989	355
38	Problems Perceived by Type of Traders and Location Misamis Oriental, Bukidnon, and Wao, Lanao del Sur, 1989	356
39	Problems Perceived by Trader/Shippers in Cagayan de Oro, 1989	357
40	Problems Perceived by Trader/Shippers and Commercial Corn Millers in Cebu, 1989	358
41	Problems Perceived by Custom and Commercial Corn Millers in Region X (Northern Mindanao), 1989	359
42	Problems Perceived by Sample Feedmillers in Cagayan de Oro and Cebu, 1989	360
43	Problems Perceived by Sample Backyard and Commercial Hog Raisers in Northern Mindanao X, 1989	361
44	Problems Perceived by Sample Backyard and Commercial Hog Raisers in Cebu, 1989	362
45	Problems Perceived by Poultry Growers in Northern Mindanao and Cebu, 1989	363
46	Projected Cash Flow - 100 Sow Level (Monthly Estimates)	364

EXECUTIVE SUMMARY

I. INTRODUCTION

Corn is the second most important crop in the Philippines. It covers about half of the country's total grain area, provides income to one third of the Filipino farmers, and its grits serve as a staple food for about one fifth of the national population, mostly in the Visayan and Mindanao Regions. The food industry processes corn into high value consumer products, such as corn starch, corn oil and snack foods. However, the major processor of corn have become feedmillers and hog and poultry raisers who support the country's robust hog and poultry industries. In other words, three major end-users of corn are competing for its limited supply:

Due to the economic and political importance of corn, the government has been endeavoring to support corn production through direct interventions, such as price support and supply stabilization schemes, and give it priority status in the Comprehensive Agrarian Reform Program. Seven areas of institutional support for the corn commodity system by the public sector include: policy formulation, regulation, technology research and development, training and extension, infrastructure, credit and guarantee funds and market information.



Corn makes Northern Mindanao the fourth major producer of the commodity in the country.

Today, there still remains three major challenges for policy-makers. One is how to overcome the perennial shortage of corn during certain lean months which now extends into the major harvest seasons due to soaring demand for grain from the livestock industry coupled with less area under production. This year's importation alleviated much of the demand pressure due to the shortage but is causing price side-effects that are not favorable to the corn growers. The second challenge is where and how to provide adequate infrastructure to allow the responsive and

timely flow of corn within and between the geographically dispersed supply and demand areas. The third and most difficult challenge is what methods will improve the livelihood and income of the small-subsistence corn farmers. "The Corn Marketing System, A Rapid Marketing Appraisal in the Northern Mindanao Region" was conducted to focus on such issues from a location-specific perspective during the first cropping season of 1989.

Northern Mindanao, Region X, was the fourth major corn growing region in the Philippines in 1988 and supplied substantial amounts to the major demand areas of Cebu and Manila. Cagayan de Oro City, the region's main trading and transshipment center, has port facilities that are considered among the most modern in Mindanao. Large investments in corn processing and the recent expansion of commercial livestock raising complement the city's role as a major trading center for corn.

Yet, minimal progress has been made in realizing this region's potential for increased corn productivity, additional areas planted to corn and increased utilization of large scale corn milling capacity. The local poultry industry likewise cannot keep pace with the growing local demand for meat and poultry products. Meanwhile, many farmers, particularly in interior areas, remain at subsistence levels and strive to make a living.

The Cagayan de Oro Chamber of Commerce and Industry Foundation, Inc. (Oro Chamber) conducted this Marketing Assessment for corn as a sub-project under the Accelerated Agriculture Production Project (AAPP) of the Department of Agriculture through a grant from the United States Agency for International Development. The project was supervised by a Project Core Group whose members were from the Oro Chamber, the Don Mariano Marcos Memorial Polytechnic State College and the Department of Agriculture, Region X. An interdisciplinary team was selected and trained to conduct the study using the Marketing Assessment methodology. An agricultural marketing specialist from the AAPP project guided the team which consisted of a principal investigator, two senior and six junior researchers and an administrative assistant. Additional technical assistance was provided by two marketing staff of the Bureau of Agricultural Statistics (BAS), Central Office and a market information staff from the BAS Bukidnon Office. In addition, a local consultant researched the hog industry while an agricultural marketing consultant from the Agricultural Marketing Improvement Strategies (AMIS) project of USAID reviewed the findings of the study.

The purpose of the study was to analyze the organization, operation and performance of the corn commodity system in Northern Mindanao. Its specific objectives were to provide an overview of the corn commodity system as it originates from the supply areas in Region X and extends to the major demand areas in Region X on to the major demand areas in Cebu and Manila; identify, diagnose and prioritize problems in that commodity system; and propose an Agenda for Action and Research as well as suggest ways to approach alternative solutions.

The Marketing Assessment has these four phases: Phase I Background Information Collection and Analysis; Phase II - Rapid Marketing Appraisal for System Overview and Problem Identification; Phase III - In-depth Analysis of Priority Problems; and Phase IV Monitoring and Evaluation of Corrective Actions as Implemented. This study completed the first two phases and designed proposals for Phase III. The agenda for action and research outlines important approaches of which two were developed into proposals; one on the pilot testing of rehabilitated tractors under varied management arrangements and the other a pre-feasibility study for investments in the poultry industry.

The commodity system's approach in the Marketing Assessment methodology identifies and examines this complex interrelated set of issues and problems from several perspectives, i.e., according to the production, distribution, processing and consumption levels in the commodity system. The systems approach helps relate causes of problems to their impacts or consequences, particularly when cause and effect are widely separated in time and location. For example, although aflatoxin harms urban consumers of wet grits, it begins growing on wet corn sold at the farm level.

The field work involved interviews with the marketing participants as classified within the production, distribution, processing and consumption levels of the commodity system. Sample selection was done with the "tracing approach" whereby the flow of corn started from the farmer's field and extended to the different types of buyers up the marketing channels and to the final end-users. The municipalities chosen as supply areas were Malaybalay, Don Carlos and Kalilangan in the main corn producing province of Bukidnon; Claveria, a large and highly diversified area in Misamis Oriental Province; and Wao, a farm settlement area in Lanao-del Sur Province. Wao was selected despite being in Region XII (Central Mindanao) because it is Northern Mindanao's largest outside source of corn grain. The tracing method led to the main trading center of Cagayan de Oro City and extended to the outside major markets of Cebu and Manila. Over 400 interviews were conducted with 350 respondents in Northern Mindanao and 54 respondents in Cebu.

II. FINDINGS AND INSIGHTS

This summary covers the overview of the study, a synthesis of the marketing system performance and the agenda for action and research. Each section highlights the main points from an analysis of the field work which includes priority issues and concerns raised during public forums and workshops with leaders and key participants in the corn system in Bukidnon and Cagayan de Oro. In many cases, the resulting priority problems and recommendations hold true in other areas and therefore represent conditions beyond the team's research sites.

A. Overview

The overview begins with the national situation for corn, summarizes conditions in Region X and then follows events from the beginning to the end of the first cropping season, 1989. After highlighting this general setting, the situation and relevant findings at the production, distribution, processing and consumption levels are discussed. Then, an understanding of how these levels are vertically linked through formal and informal buying and selling transactions as commodities, money and information flow through various channels, provided the insights needed to explain why major problems persist in this commodity system, especially as it originates from Northern Mindanao.

1. Setting

Northern Mindanao, unlike many other parts of the Philippines, has much arable land waiting to be cultivated. The area is relatively free from typhoons that damage crops and has a

low farmer population density. With these considerations, the region can easily accommodate "extensive" agriculture through farm mechanization and labor intensive farming practices. Yet, the corn industry has barely tapped its substantial potential to rapidly respond to the corn demands. Several reasons for the limited use of its vast potential were found during the study of this very unusual peak harvest season.

The corn market during the first cropping season of 1989 was a dynamic period in the corn industry. Several events affected the demand for corn. The increasing price trend for meats and the expected strong demand for meat and poultry products enticed several Luzon-based Integrators to embark on separate expansion programs both in Luzon and at new sites in Mindanao. These programs combined with expansions by smaller commercial hog and poultry raisers occurred during the period of minimal yellow corn imports, 1987 to 1988. Consequently, pressures built for the 5-6 Integrators and other feedmillers to increase procurement of both domestic white and yellow corn. Corn prices steadily rose.

From a supply perspective, a typhoon damaged the large yellow corn crop in the Cagayan Valley of Luzon and then rumors circulated in Manila about the substantial land area in Mindanao being converted from corn to higher value crops during the first cropping season of 1989. Such a shift in crops could have been a reaction to the very low prices during the 1988 peak harvesting season. Yet, whatever the cause, both events fueled apprehensions of feed shortages before the large livestock population could be marketed during the Christmas holidays of 1989.

The Region X situation for farmers was favorable during that period. Beginning with the June-July harvests in the southern municipalities of Wao, Kalilangan and Pangantucan sunny harvest days meant wide-spread harvesting and lines of corn laden trucks transporting high priced corn to Cagayan de Oro City and from there shipments to Manila and Cebu. August corn prices remained unusually high but rainy days created impassable road conditions and slowed the flow of corn from those major interior production areas. Meanwhile, farmers in the municipalities of the Bukidnon Watersheds rapidly harvested and transported corn to Cagayan de Oro, anticipating a drop in prices any day.

By September the road bottlenecks to interior corn areas were clearing, prices for corn remained high and relatively consistent volumes of corn flowed out through the Cagayan de Oro port. However, in the meantime the "shortage mentality" in Luzon created political pressures to allow imports of yellow corn for the feedmillers. At that time, rumors of imports caused many buyers in Luzon to stop buying yellow corn and "wait and see" who received much of the imports. Without those big buyers in Manila, most Cagayan de Oro traders also stopped buying, so the price of yellow corn in the local market dropped, ceasing its upward climb parallel to the white corn price.

Yet in the meantime, the price of white corn grain continued upwards due to the strong Cebu market. By that time, the starch manufacturers had procured very large volumes of white corn because corn starch was earning very favorable returns. That procurement directly competed with Cebu-based corn millers whose grain inventories were very low. That competition throughout August and September boosted the prices of white corn. Thus, by late September, the Cebu-based corn millers found themselves in serious trouble with less than their usual month or so of inventories.

With the feedmillers early market entry, then the starch manufacturers buying large volumes at significantly higher prices than in previous years, the millers were left with a small

share of the decreasing volume of white corn. Other serious problems hit their industry even as they bidded-up prices of corn grain in order to mill at least something for their customers. Problems of too much wet corn grain coming from Cagayan de Oro, brown-outs in Cebu City, inflows of higher quality grits from Southern Mindanao and rice imports which made rice cheaper than grits in the retail markets had further eroded the viability of their industry.

The October-November period marked not only the slow down of grain outflow from Region X given the completion of harvests and limited stocks, but also the temporary closure of some Cebu millers or milling of small quantities of grain on a day to day basis or buying and reselling grits from Mindanao. Meanwhile, hog and poultry raisers faced substantially higher feed costs.

Northern Mindanao was effectively drained of corn due to the high prices during the July-August-September period. That resulted in small inventories of corn being held until the December harvests of the second cropping season. Imports arrived in October as the national debate continued on how much yellow and white corn to import and how to allocate it. Then finally the December holidays absorbed large amounts of the pork and poultry products and thereby sharply reduced the number of commercial animals feeding. This reduction might have even been greater than the normal pattern because of the smaller inventories held by the traders and the lack of NFA stocks.

During a typical year, the NFA served as the farmers' "buyer of last resort" whenever the farm price fell below the support price of P 2.90/kg. However, this year the price support scheme was not applicable because the farm price did not fall below P 2.90/kg. Thus, the NFA seldom entered the market and consequently, the usually full NFA warehouses were totally empty.

The NFA's mandate is to intervene in the grits market during the lean months to stabilize retail prices. On these occasions, white corn stocks are sent to selected millers on a milling contract basis. The NFA or the miller distributes the grits on the basis of a ceiling price. However, without NFA stocks, imports will be required this coming year in order to implement that mandate. Thus, it is clear that the coming January-May lean months will be especially bleak unless imports of both yellow and white corn grain supply the feedmillers, corn millers and starch manufacturers alike.

2. Production Level

Crops in Northern Mindanao are rainfed crops with distinct seasonal patterns defined by rainfall patterns. Rainy months peaking September-November and dry months centering on February or March. The seasonality of planting and harvesting defines the first cropping season with June/July harvesting in southern Bukidnon but August/September harvesting in northern Misamis Oriental near Cagayan de Oro City. Higher elevations within these provinces extend crop maturity and thereby delay harvests by one to two weeks. Planting in the second cropping season begins within four to six weeks after harvest leading to December or January harvests.

In locations where irrigation systems have been constructed, corn growers converted their lands to rice or sugarcane cultivation, depending on whether the latter is within reach of a sugar mill. Thus, the provision of irrigation is not likely to expand corn production. Any increase in corn production area can be expected under rainfed conditions in Bukidnon.

Although corn crops usually thrive in soils with over 5.5 pH, soils in corn growing municipalities of Bukidnon Province and Claveria municipality were generally acidic with farmers cultivating corn in 4.5 - 5.5 pH soils.

Terrain varies widely with rolling hills near the coast, large expanses of ravine-worn plateaus further inland and the wide lower Watershed area in southern Bukidnon with several small enclosed plateaus or feeder valleys stepping down and merging into the Watershed. For a given soil quality, corn thrives better on flatter fields.

The sample production areas for the study were representative of three different agro-climatic regimes: 1) the northern and southern part of the wide Watershed in southern Bukidnon Province; 2) interior portions of the inter-linked chain of plateaus and valleys, climbing westward from the Bukidnon Watersheds along the main road to Wao, and 3) the rolling plateau near the seacoast in Claveria near Cagayan de Oro City. Distinctive characteristics of the three sites that influenced or were affected by corn production and marketing will be discussed later.

Sample corn farmers came from two basic types of barangays, i.e., unplanned barangays that had gradually grown from the few initial families into hundreds of loosely associated households or those recently established settlements with carefully laid out household plots and 6 - 8 hectares given to each farm family. Within both situations one could find agribusiness farmers with 5 or more hectares planted in hybrid varieties as well as semi-subsistence farmers planting white varieties on their 1 - 2 hectare farms.

The location of the barangay in relation to the main road proved to be very important. Four of the five sample interior barangays had these characteristics: dominance of white corn varieties, comparatively higher cost for and lower use of inputs in relation to roadside barangays, limited access to or use of trader credit, less advantageous agro-climatic conditions, restricted or no regular jeepney passenger service, skewed land distribution with a few large landholders and several landless or small landholders and generally a smaller number of households. The brighter situation of farmers in the fifth interior barangay was exceptional because the barangay road was recently improved. After that improvement farmers transported their corn directly to the higher priced poblacion (town centers) buyers while barangay traders spoke about going out-of-business.

Farmers perceived white and yellow corn in different ways. White corn usually meant the traditional open-pollinated variety milled for grits for household consumption and/or cultivated under less favorable conditions or planted when little capital was available. Whereas yellow meant hybrid corn. Hybrid yellow corn was more commonly planted in better fields in terms of less slope, higher quality of soil, and closer proximity to roads as compared to traditional white varieties growing on sloping and less accessible fields. Given more favorable rainfall patterns in the first cropping season, hybrid corn growers with adequate capital planted larger areas during that season. However, for the drier and riskier second cropping season, those same farmers often preferred white varieties or F2 hybrids, i.e., seeds selected from the just harvested hybrid crop rather than pay P 600 - 800/ha for new (F1) hybrid seed. The team found only a few exceptional cases of farmers experimenting with white hybrids or planting yellow open-pollinated varieties.

The average cost of production for 20 sample yellow hybrid corn growers during the 1989 first cropping season was P 5,264 or P 1.53/kg for an average yield of 3,444 kg/ha. Of this cost 59% was cash cost. Whereas for a sample of 20 white corn growers the average cost of production was P 3,105 or P 1.50/kg for 2,067 kg/ha of grain. Of that cost, 48% was cash cost.

Although the higher costs and better yields of hybrids were expected, the relatively high costs for white corn varieties was not expected, especially given their limited yield response to fertilizer applications. Thus, an important insight involved a growing perception among farmers that "the more fertilizer, the better!" However, that conviction of the merits of fertilizer is not balanced by the "economics" of fertilizer use, so naturally, production costs become too high relative to prices earned. A farmer's response, "If I have more money, I will buy more fertilizer." needs careful monitoring.

High cash costs confirm the need for farmer financing. Sixty-eight percent of the sample farmers availed of production credit mostly from informal sources, such as traders or input dealers. However, active farmers groups have been recently given formal credit for hybrid corn crops by the Land Bank. In fact, that lending has been substantially expanded since last year. The insurance coverage by the Philippine Crop Insurance Corporation is included in that formal loan agreement.

The hybrid corn seed industry's vigorous promotion programs over the past 3 years substantially increased hybrid seed's share of the seed market in Bukidnon. Of the three major seed companies in Bukidnon, i.e., Pioneer, SMC, and Cargill, one recently established a seed multiplication unit contracting with Bukidnon farmers. The two main seed promotion strategies were: 1) "sales promotion" whereby thousands of sacks of seed were distributed through networks of dealers, traders and large farmers with sales discounts and "charge-to-crop" payment schemes but little technical backstopping and 2) "technology promotion" whereby seed is paid on a cash-on-delivery basis but technology demonstration and support are provided from seed service centers and roaming field staff.

Indicative of the industry's progress is the increased percentage of yellow relative to white corn outflow from Cagayan de Oro from June to September in 1989 compared to the same period in 1988 (43% and 31%, respectively). The shift to yellow corn occurred despite the consensus that many hectares of prime hybrid corn were converted to sugarcane in that 1989 season. Field staff of the hybrid corn companies successfully promoted hybrids in the more interior areas in this season.

The recent merger of the Pioneer and SMC Hybrid Seed Company, which account for over 70% of the hybrid seed market, raises questions about the future competitive environment of the hybrid seed industry and the consequences for programs supporting farmers' adoption practices. This is especially important since the team found no independent seed company distributing improved open-pollinated varieties in Bukidnon.

a. Key Findings

* Sample farmers earned between P 0.80/kg to P 1.10/kg more for their corn during the 1989 first cropping season compared to the same period in 1988;

* Farm prices of corn in Wao were P 0.75/kg to P 1.05/kg less than the prevailing price in Cagayan de Oro, due primarily to transportation costs;

* Of the 40 sample farmers interviewed regarding their production cost, almost 80% sold their corn beyond the farmgate;

* Dominance of acidic soils means lower yields or additional expenditures for complete liming every 3-4 years in order for corn to reach higher yields;

* Deteriorating status of "traction power" in corn growing areas as aging and used tractors become more scarce and the number of carabaos continue to decline due to the relatively high price of meat and rustling;

* Scarcity of traction power during the narrow time slot between the first cropping season harvest and preparing land for the second cropping season is a major constraint for expanding corn production in western Bukidnon;

* Crop substitution, especially sugarcane, contributed to the reduction of corn area in Bukidnon during the first cropping season of 1989;

* Instances of excess use of fertilizers on white open-pollinated varieties of corn brought about by the attitude of "more fertilizer means better yields" seriously overlooked the "economics" of corn production, consequently pushing costs of production to very high levels;

* Gradual but verifiable shifting out of white varieties into yellow hybrids, especially under favorable agro-climatic conditions with very few cases of white hybrid use.

b. Major Problems

The major marketing problems expressed by the sample farmers were:

- a) inadequate post harvest facilities, mostly drying floors;
- b) inadequate capital, mainly for crop production costs;

- c) price fluctuations/low prices; and
- d) poor road conditions.



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A basketball court conveniently doubles as a corn drying floor.

From a production perspective farmers frequently mentioned: weeds, insects and diseases; unpredictable weather conditions; high costs of labor and materials; and lack of working animals for land preparation.

3. Distribution Level

The most complex set of marketing participants are the traders operating in Northern Mindanao and in the demand centers of Cebu and Manila. Their multiplicity of enterprises generally corresponded to the opportunities available within the location in which they began business, thus making generalization difficult. For example, traders could also be farmers, corn-millers, hog raisers, owners of input supply stores, and truckers, as well as own a wide range of non-agricultural enterprises ranging from a small sari-sari store to a multi-million peso shopping complex.

This RMA classified the traders according to their scope of buying areas, sales patterns, management/ownership arrangement and the degree of backward or forward integration in the commodity system. Barangay, municipal and provincial traders were categorized according to the scope of their buying areas. Whereas "traders" were noted for their use of vessels to ship corn grains from the Cagayan de Oro port. "Agents" were traders funded by and acting in behalf of other traders, whether in the supply or demand areas. "Canvassers" played the role of brokers as they allocated the truck loads of corn sent by their distant clients to the corn buyers with the highest bids in Cagayan de Oro City. "Processor/traders" meant large corn millers who also have considerable resources involved in the storage and trading of yellow corn.

Most traders were family enterprises, i.e., single proprietorships, from an ownership/management perspective. The larger trader/shippers and processor/traders, however, were frequently corporate structured, with family or clan members as incorporators. Another perspective was the recent increase in forward and/or backward integration whereby larger Cagayan de Oro-based traders supported sales and delivery offices in the demand-areas (forward integration) or buying stations in distant supply areas (backward integration). Family relatives managing these sales offices or buying stations usually also had one or two other businesses, such as auto parts, input supplies or general merchandise stores. Four Cebu-based traders have also integrated backwards into Cagayan de Oro with their establishment of buying stations. Among the Luzon-based Integrators, only one has set-up a facility in Cagayan de Oro.

This section will briefly examine each type of trader before exploring the historical shift in the market structure which created today's uniquely complicated situation in Cagayan de Oro.

a. Types of Traders

The Barangay Trader, with his personal or financial relationship with farmers, bought corn, transported it either to the nearby poblacion (town center) for sale to larger traders, hog raisers or corn millers or hauled it directly to Cagayan de Oro for "suki" or spot market sale. Many operators of small sari-sari or general goods stores in the barangays were barangay traders. These traders commonly provided credit for consumer goods during the crop production periods on a "charge-to-crop" basis or stored corn could be bartered for goods or harvesters sold small quantities for cash or goods. Whenever these traders had sufficient capital or received financing from larger traders, they financed other farmers' corn crops. Given their intimate knowledge of local agriculture, experience growing corn, daily contacts with farmers and more enterprising nature, barangay traders could usually recover their financing by collecting corn from "suki" farmers as the harvesting was being done.

The Municipal Trader was usually located in the commercial center of a municipality, began small scale buying and selling and gradually expanded in size and mix of enterprises, if industrious. The municipal trader commonly established his buying station along the main highway or near the public market where jeepneys loaded with passengers and corn arrived from the surrounding country side. This medium to large scale trader of local agricultural commodities provided services, such as financing, shelling, drying, and transporting, to his suppliers, i.e., barangay traders or local farmers, within or near his municipality. Cagayan de Oro buyers were his main outlet for corn.

His multiple enterprises reflected local opportunities. For instance, the larger traders in the interior agricultural municipality of Kalilangan were likely to operate two or more trucks, and be agri-business farmers as well. Whereas those in the business and trading center of Valencia on the major highway from Cagayan de Oro, not only owned and operated trucks and general goods stores but a wider range of non-agricultural businesses, such as gas stations, restaurants and auto parts stores. These traders are the backbone of the corn supply areas of Region X.

The Provincial Trader was the large scale commodity buyer who procured corn from more than two municipalities within the province, maintained daily contact with Cagayan de Oro buyers with his radio transceiver regarding prices and market conditions, and frequently sent truck loads of corn to Cagayan de Oro buyers. The main distinction between this buyer and a municipal buyer was the scale of operations, especially in terms of sending his agents with trucks to buy freshly harvested corn from many dispersed areas rather than "waiting" for "sukis" to deliver corn to him. These were usually big entrepreneurs with commercial corn mills, large piggeries, large farms and/or a mix of several other businesses. Several provincial traders have relatives in Cagayan de Oro as well as in demand areas who take responsibility to sell and ship the corn arriving from their main warehouses in the supply areas. In recent years, several of these types of traders have been diversifying into businesses not related to corn, especially given the expansion of more profitable sugarcane cultivation along with support services required for its production and harvesting.

The Canvasser acts a "broker" for distant farmers or traders who are searching for the highest priced buyers in Cagayan de Oro City. The large canvasser keeps his clients up-dated on daily changes in price and market conditions in Cagayan de Oro through radio transceivers. Having begun as one of several commission agents, the canvasser grew in scale and scope of operations over the years. Early each morning he telephones several large buyers, selects whoever offers the most favorable price and sends them truckloads of corn from his clients as soon as the trucks arrive. Other services varied by the size and type of business the canvasser has or can access. For example, some provide financing to their clients as well as trucking services while others sell the farmer's corn and use the sales proceeds to purchase inputs on behalf of their clients so that the trucks can backhaul the inputs.

The Trader/Shippers usually hire vessels to ship their corn grain to buyers in Cebu and Manila. Most are located in Cagayan de Oro, operating with warehouses along Puntod Road leading to the pier or along Lapasan Road which is the main access road into Cagayan de Oro from Bukidnon. The original trader/shippers maintain part of their "suki" system but have become more dependent on canvassers and the spot market transaction whenever trucks arrive from supply areas. The following section on the historical change in the structure of the corn market will describe this grouping in more detail.

Trading practices varied by the market condition, for example, in a "buyers market" price or quantity discounts were imposed on sellers with over 15% moisture content whereas in a "sellers market" (shortage condition) discounts were much less stringent as several buyers competed for the limited supply.

b. Changes in Market Organization

From an historical perspective, the organization of the corn marketing system has undergone a major change between the early 1970s and today. In former days, a few large scale miller/traders and trader/shippers supported a large hierarchical network of small-medium scale agents in the production areas. They shipped out large quantities of grits and grains through the Cagayan de Oro port. Grits outflow to the Visayan Region was especially large from 1978 to 1980.

Two major events changed that structure, the 1982 drought and the 1986 port expansion. The drought period from 1982-83 adversely affected the large scale trader/shippers in two ways: first, their financial support to farmers could not be recovered without any harvest and second, there was little corn to trade. Then, in 1986 the expanded port facilities and increased shipping services between Cebu and Cagayan de Oro encouraged many new trader/shippers as well as buying stations of Cebu millers to enter business in Cagayan de Oro. These new trader/shippers rapidly bought corn in the spot market and shipped it overnight to Cebu.

In the meantime, many former agents of those large scale trader/shippers became "independent traders" and formed their own group of mobile or resident barangay or municipal agents. These medium scale, independent traders sent their corn to Cagayan de Oro for spot market sales to more than 25 trader/shippers competing for Bukidnon harvests. Likewise, several farmers have become "agri-businessmen" by planting 5 or more hectares of hybrid corn, applying improved packages of practices and hiring trucks to haul their harvests directly to Cagayan de Oro canvassers who sell on their behalf. Consequently, the scale of procurement by most of those former large scale trader/shippers had substantially declined in this fiercely competitive market.

Implications of this historical change include, but are not limited to, the following:

- a) trading margins were reduced, especially when very small firms could survive on very narrow margins;
- b) canvassers instigated vigorous price bidding among Cagayan de Oro buyers;
- c) so many trader/shippers have become active that monitoring, regulating and gaining agreement on quality is no longer practical, consequently quality continues to suffer;
- d) instead of large scale grain suppliers servicing many types of buyers, each small scale buyer in Cagayan de Oro regularly supplies a particular type of end-user, such as corn millers, feedmillers or hog raisers;
- e) "secrecy" is encouraged within the marketing system rather than "transparency", thus creating serious data collection problems with the government agencies given that mandate (BAS and NFA);
- f) large trader/investors are discouraged from investing in improved storage or drying facilities because of no economies of scale in the use of those facilities and price uncertainties caused by imports; and
- g) lower volumes of grits are flowing out of Cagayan de Oro compared to before.

c. Key Findings

* Excess competition for corn discouraged large traders in Cagayan de Oro City from financing farmers, inhibited quality control, contributed to a less orderly market and encouraged marketing of wet corn in a "sellers market".

* Corn from Region X has steadily gained a larger share of the Cebu market, especially after the completion of the port in Cagayan de Oro.

* Damaged bridges and poor conditions from Maramag to Wao restricted use of 10-wheeler trucks and substantially increased transportation costs for traders, thereby reducing farm prices.

* Spot market transactions have become more frequent than "suki" sales arrangements in Cagayan de Oro.

* Inability to safely handle large amounts of cash in interior areas decreased local competition from large scale outside buyers and thus limited the bidding-up of farmer prices.

* Three or four Cebu-based traders have set-up buying stations in Cagayan de Oro in order to improve access to quality corn.

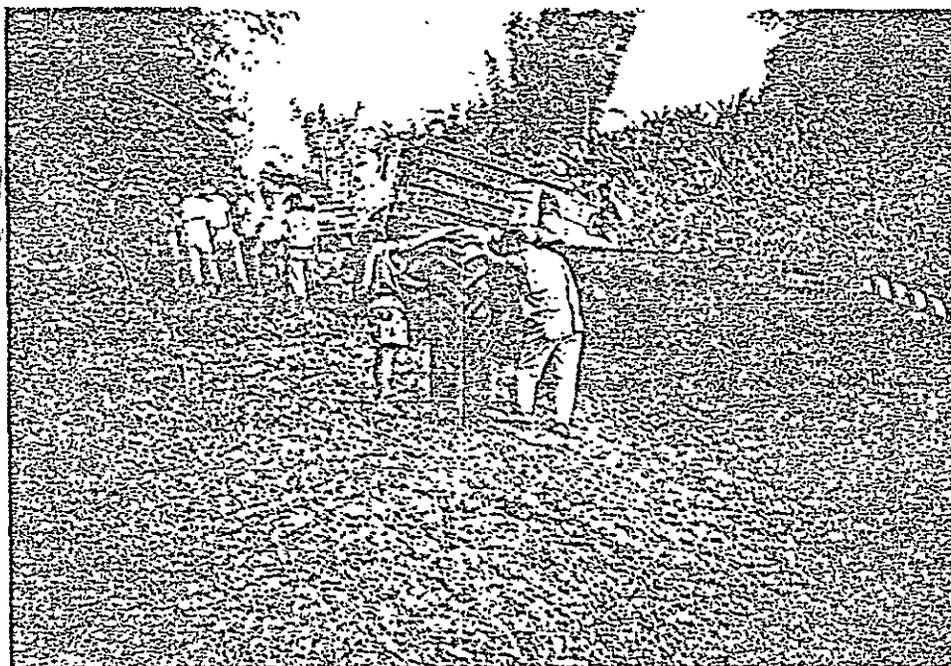
* Other Cebu-based traders not only supply grain to Cebu end-users but also distributed Mindanao grits to local wholesalers.

* Since 1985 many new entrepreneurs began trading in Region X, among these are relatives of established Cagayan de Oro traders who were sent to reside and trade in interior production areas in order to improve those large traders' competitive position.

* Fixed schedules and regular registered routes for container and roro vessels can not adapt to the highly seasonal corn whereas flexible routes and schedules for tramp vessels result in higher costs due to limited backhaul opportunities on this seasonal basis.

d. Major Problems

Major problems varied from traders primarily buying and selling corn within the supply areas versus trader/shippers who dealt with the market beyond Region X. Local traders emphasized the poor condition of bridges and roads to Wao, inadequate working capital, price fluctuations, low credit recovery, wet corn and limited supply of corn during this 1989 first cropping season.



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A truck slides into a ditch after heavy rains made the road slippery.

Trader/shippers were mainly concerned with limited space on vessels, substantial shortages of corn this season, high moisture content, inadequate working capital, price fluctuations, and pilferage in the Cebu port. One should recall when evaluating problems cited by respondents that the desire for more working capital, as stated by most small-medium sized traders, is a trait of that type of business; thus its frequent response as a problem was expected.

4. Processing Level

Four major types of corn processors were found within the corn commodity system, namely, corn millers, feedmillers, starch manufacturers and corn oil manufacturers. Those demanding white versus yellow corn will be highlighted before discussing each type of processor.

The main sources of competition for yellow corn beyond the supply areas exists between and among the Luzon-based big Integrators (feedmillers/hog and/or poultry raisers/meat processors) and other feedmills and hog and poultry raisers dispersed throughout the country.

For white corn, the corn millers and starch manufacturers in Cebu have traditionally competed on a seasonal basis. The starch manufacturers bought large quantities primarily during the low priced, peak harvests. On the other hand, corn millers usually procured in a relatively small amounts all year round with larger amounts near the end of the peak season while maintaining inventories for only one month or so. However, with the increased demand for meat and poultry products and the continued growth of the livestock industry plus the 1986 ban on yellow corn imports, the feedmillers and animal raisers began to vigorously compete for white corn grain to compensate for limited volumes of yellow corn. Consequently, feedmillers bid up corn prices and absorbed increasing amounts of white corn, especially during the lean months.

a. Corn Milling Industry

Cebu City is the second most populated city in the Philippines, located within the Visayan Regions where grits have traditionally been the staple food, and thus serves as the demand center for grits. In other words, Cebu City has been at the center of the corn milling industry with the largest number of corn mills. Since its larger mills have similar milling capacities, they compete among themselves in procuring better quality of corn grain and in sales strategies for their grits, especially beyond the city itself.

Cebu-based millers have historically depended on Mindanao corn to cover the local corn deficit. However, large scale commercial corn mills have gradually been established in the main Mindanao ports near major corn supply areas, such as General Santos, Cagayan de Oro, Davao and Cotabato cities. Since most of those mills were set-up by local trader/shippers of corn, good quality corn was milled and shipped as grits to the Visayan Islands while inferior or surplus corn was shipped to Cebu. Consequently, the comparative advantage of corn milling seemed to be shifting from locations near major consumption areas for grits, i.e., Visayan Regions, to locations nearer corn production, i.e., Mindanao.

In Northern Mindanao, the three types of corn mills are custom, commercial and custom/commercial mills with the first two being the most common. Small scale custom millers are scattered throughout the countryside and around Cagayan de Oro City. They service local households who bring sacks of white corn grain for milling and receive payment in cash or in kind, i.e., milling by-products of bran and "tik-tik". However, few entrepreneurs have entered custom milling in the sample areas during the 1980s.

Large scale commercial corn mills, unlike that service type of business, buy their own grain, mill it and sell the grits in the local retail markets or ship it to the Visayan Region. Both types of business use traditional milling technologies designed or copied from Cebu mills whose owners had been contracted to build new mills in Mindanao.

For Region X's commercial corn mills, 1978-80 were the peak years of grits milling and shipments throughout the Visayas. The 1982-83 drought period seriously reduced their grits output because of substantially reduced corn harvests. In the meantime, corn grits demand was reportedly declining, so the Cagayan de Oro millers never recaptured their former volume of milling. In fact, most large scale mills are operating far below capacity.

Comparison of Cebu and Cagayan de Oro Millers

The corn milling industry of the Visayan and Mindanao Regions has maintained the same basic milling technology over the past decades with the design duplicated from its Cebu origin. Old established firms in Cebu helped engineer most of the Mindanao mills. Changes in construction materials and increased automation mark the newer units from the old. Milling capacity is expanded by installing additional milling units, not changing the design, except perhaps for one specially designed mill in Cagayan de Oro. Other aspects of the milling industry varied substantially between millers based in Cebu and Mindanao.

Differences by location included inventories maintained, capital exposure, facilities and labor force and nature of the business. The Cagayan de Oro miller carried grain inventories for a couple of months because of combined trading and milling businesses whereas the Cebu-based miller only kept a couple of weeks to one month inventory of grain. Less inventory meant reduced capital exposure, especially given the high costs of money, as well as allowed more credit to be carried by their sales network of wholesalers and retailers.

Another major difference between the commercial Cebu-based and Cagayan de Oro-based corn miller was the nature of his businesses and layout/size of his facilities. The Cebu miller was more specialized in milling and grits distribution with few employees, a fairly large warehouse and milling building and a small office but very little land area. Most of these millers were located within the large metropolis city of Cebu. The large type of commercial corn miller in Cagayan de Oro and Bukidnon was usually diversified into corn-related businesses with many employees, large warehouses/milling buildings, a moderate sized office, vast cemented areas for drying corn (and/or a mechanical dryer), a fleet of trucks for both long and short distance hauls, and an assortment of other equipment for trading or processing of various agricultural products.

Consequences of those differences include the following six points:

1) Mindanao millers have substantial advantages in processing related costs in terms of lower wages, lower cost and more dependable electricity, generally more timely access to grain, and comparable milling recovery rates with Cebu millers. Likewise, the additional costs of shipping grain by sea from Mindanao to Cebu should add substantially to the costs of Cebu millers. However, this strong comparative advantage in costs is somewhat off-set by their following disadvantages.

2) Access to several sources and grades of corn is an advantage for the Cebu millers who can buy wet, lower cost grain from Cagayan de Oro with dry, high priced grain from General Santos and Davao before milling. The alternative sources were to help ensure better quality, to bid down prices between the various sources and not to invest in drying floors or mechanical dryers because they can mix poorer and better quality to get "acceptable quality."

On the other hand, Cagayan de Oro millers only procure locally and attempt to screen for drier grain. However, since much wet corn is available during the rainy season's peak harvests these millers have invested in solar and/or mechanical dryers. These dryers require additional time and costs for drying the grain before milling. Likewise, due to seasonality of harvests, longer term inventories were maintained and high costs of capital are accrued.

3) Whenever there were serious local problems with the corn crops, such as the 1982-83 drought, Mindanao millers were particularly vulnerable because of delayed repayments of substantial amounts of cash distributed to "suki" suppliers, the underutilization of large facilities and many employees without work. On the other hand, Cebu millers can procure from other locations or "wait out" the problem with limited overhead costs.

4) Mindanao millers tied-up cash simultaneously in supplier side advances, larger inventories of yellow and white corn, operations and maintenance of a fleet of old trucks, payments due for grain shipped to Manila and delayed payments within the grits distribution system itself. If all went well, income came from several sources, but if the corn situation was problematic, the high cost of money was really felt. On the other hand, the minimal cash exposure for the Cebu millers was primarily within their grits distribution system and small inventories.

5) Mindanao millers' management time and expertise were scattered among several enterprises in addition to their grits distribution system. Therefore they had to rely more on their distributors in various locations who received and distributed large shipments of grits. On the other hand, Cebu millers with second generation entrepreneurs who managed the family business were quite attentive, skilled and responsive to finely tuned distribution networks with multiple strategies for providing better or cheaper services to Visayan retailers than competitors from Mindanao.

6) Mindanao millers are farther from the Visayan Islands and do not have good access to shipping services for those islands on a regular basis as millers in Cebu. This access increases the competitive edge of Cebu millers who excel in their detailed understanding of the timing of demand for each large Visayan city, ability to retrieve and replace unsold grits, and inclusion of milling by-products as well as rice in their distribution channels for grits.

A synthesis of those factors suggests that the relatively recent strategy of a few Cebu millers may create another structural change in the future of the grits industry. That strategy is for Cebu millers to procure and distribute high quality and lower cost grits with the superior Cebu distribution system. If properly integrated and monitored, that strategy would be very difficult to match by either set of millers alone.

b. Feedmilling

Feedmilling trends follow those of the meat market, thus projected increases in demand for meat and poultry products instigated recent expansion by several large Integrators in Luzon, including branch facilities in Mindanao.

This trend has gained strength throughout 1989. The two feedmillers in Cagayan de Oro, i.e., one a cooperative and the other a branch unit of a Luzon-based Integrator, have not been able to keep up with the demand for feeds. Large scale inflows of poultry feeds suggest the need to further expand local feedmilling capacity in this competitive and expanding sector. Consequently, feedmillers and large hog and poultry raisers have been vigorously competing for corn and bidding up corn prices. The typhoon damage to the large yellow corn crop of the Cagayan Valley followed by rumors of Mindanao land being converted from corn to higher valued crops during the first cropping season fueled apprehensions of shortages and accelerated procurement throughout the 1989 first cropping season.

c. Starch Manufacturing

The market for starch was unusual this year in terms of high prices and very strong demand that some manufacturers deferred repairs to facilities and equipments in order to process as much white corn as possible. The strong point for the starch manufacturing industry is its technology which permits the quick processing of wet corn grain. Thus, there is no need to dry the grain or mix it with dry grain as done by the Cebu corn millers. Other strengths include the one year or more shelf life for starch packed in plastic sacks and the manufacturers' ability to enter the market with very large amounts of capital. Likewise, gluten meal and other by-products have a ready market with local and Manila-based feedmillers.

There are very few large scale starch manufacturers to compete with for corn procurement since one dominates the South Cotabato supply areas and the other relies heavily on Northern Mindanao. Likewise, other processed forms of corn can be made for the growing snack food industry as well as glucose and caramel products.

During the shortage period of 1989, the price bid by the starch manufacturers made it more profitable for some millers to sell white corn grain to the starch companies than to mill it into grits. Yet, even given their strong market presence, the total volume procured by the starch manufacturers was so far below demand that they petitioned for imports of white corn.

d. Key Findings

* Market share of grits for Cagayan de Oro millers was greatest in 1978-1980, after which it sharply dropped and never fully recovered.

* Corn milling industry of today is a "sunset industry" given reported decreases in grits consumption, the pattern of grits shipment, lack of new entries into this business, very substantial under-utilization of existing milling capacity and remarks of most sample millers.

* Corn millers in Cebu City milled very small quantities of grits from late September to November/December, 1989, compared to any recent year.

* Aflatoxin contamination of grits in the Visayan Region during the later part of the first cropping season, 1989, exceeded that of most previous years, given the particularly wet corn milled.

* Increases in the feedmilling capacity of Region X will occur within the year.

* Corn starch manufacturing may become a "Sunrise Industry" given the strong demand trends mentioned by knowledgeable sources.

* Markets for corn-based snack foods will expand, thereby requiring larger amounts of corn grain over time.

e. Major Problems

The major problems for corn millers varied by location and type. In Region X custom millers complained about: a) low milling revenue, b) high moisture of corn and c) lack of working capital. Whereas the large commercial millers were mainly concerned with: a) inadequate supply of white corn, b) high moisture content of corn, c) inadequate bottoms and d) poor conditions of bridges and roads. In Cebu, millers cited: a) inadequate supply of corn, b) high moisture content of corn coming from Cagayan de Oro, c) lack of bottoms and d) unannounced brown-outs (power failures). The inadequacy of corn was peculiar in this season whereas the high moisture content and lack of bottoms have been chronic problems.

Feedmillers have major problems which vary by location. In Region X feedmillers emphasized: a) poor condition of bridges and roads, b) inadequate supply of corn and c) rising costs of feed ingredients. Whereas Cebu feedmillers ranked major problems as: a) high moisture content of corn coming from Cagayan de Oro, b) rising costs of feed ingredients, c) inadequate supply of corn and d) unannounced brown-outs (power failures). Region X's high moisture content was again mentioned.

Starch manufacturers in Cebu were mainly concerned about the inadequate supply of corn during this season. Since their processing technology could readily accommodate wet corn, moisture content presented no serious problem.

5. Consumption Level

Peoples in the central and southern regions of the Philippines have traditionally eaten corn grits as their staple food while in other parts of the country Filipinos rely on rice as their main staple food. Notably, the expanding hog and poultry industry, which fills the protein requirement of the Filipino diet, with some variations by income groups and location, is largely fed by corn-based feeds. Other uses of processed corn, such as corn oil and starch, also meet local food consumption needs for cooking or as the basis for "bijon" noodles, respectively. Still other uses are mainly for industrial purposes.

In other words, the multiple, large scale end-uses for corn represent such a complex demand environment that analysis cannot easily be done without an intimate understanding of at least three major subjects, namely: 1) corn grits versus rice consumption patterns, 2) consumption trends for pork and poultry products versus other meats and meat substitutes given that corn is their major feed ingredient, and 3) demand patterns and trends for industrial products based primarily on corn starch or similar derivatives.

The RMA research methodology, as focused on primary data collection regarding the corn commodity system, has insufficient access to secondary consumption data for each type of end-use for corn but found indicators of undesirable patterns and insights regarding relevant issues and findings worth exploring.

Filipino diets vary by location and ethnic group. For example, white corn grits have been a staple food in the Visayan Region whereas the peoples of Luzon are primarily rice eaters. Decades ago as the Visayans emigrated south into Mindanao, so did their demand for grits. However, that pattern has been undergoing substantial change as people of today are more frequently moving among all the islands, for example, Visayans going to Manila for school, Bicolanos searching for business opportunities in Mindanao or Tagalog military families transferring to Cebu. As a consequence of such movement and interaction, dietary patterns are steadily changing with an emerging nation-wide preference for rice while there are still locations with substantial but declining consumption of grits.

Findings at all levels of the system point to the gradual but unmistakable decline in grits consumption both in the Visayan Regions and Mindanao on a per capita basis. Within the sample corn growing areas where sugarcane and/or rice have been replacing corn crops, the former practice of households relying on custom milling their grits seems to be declining with more emphasis on retailing in some of those areas.

Corn millers in both Region X and Cebu confirmed the decline in demand for grits, yet there remains fierce competition for the remaining pockets of grits consumption and the common perception of the corn milling industry as a "sunset industry". A perspective supported by the absence of new corn millers entering this industry during the past decade.

Meat consumption, on the other hand, has been progressively growing on a per capita basis. In the Mindanao region the favorable price of carabao meat in several locations has reportedly had

serious side-effects, such as contributing to the declining population of carabao, reduction in the amount of traction power available for expanding land cultivation and encouraging thefts in a couple of the barangays sampled during our field work. The poultry industry in Region X cannot keep up with the demand for poultry products in Cagayan de Oro City, thus millions of pesos of poultry feeds and poultry products are being shipped in from other regions. And although the commercial hog industry has regular shipments of hogs to other regions, its history in Cagayan de Oro has been very erratic with many foreclosures and only a minimal number of the hogs slaughtered locally.

The major role of corn and by-products of corn processing in the feed rations for both commercial and backyard hog and poultry raisers cannot be over-emphasized. Yet, such dependence on this single feed ingredient severely reduces the flexibility of animals and farmers, especially during the lean months for corn.

Starch-based products had particularly strong demand and high value as the starch manufacturers absorbed large quantities of expensive corn grain instead of waiting for the usual price decline during the peak harvest period for corn. In fact, some Mindanao corn millers estimated that compared to milling and selling grits it was more profitable to sell their white corn grain to the starch manufacturers. Another indicator of strong demand relative to available supply was the starch manufacturers successful justification for importing white corn for starch manufacturing in addition to corn milling use.

Corn oil is made from the corn germ of both white and yellow varieties. Its consumption has not declined according to available information, however, the market share of domestic corn oils has reportedly been decreasing relative to the cheaper imported brands from Singapore. The comparatively high costs of corn grain and grits in the Philippines means higher cost corn germ (a by-product of corn milling) for oil extraction and a reduced competitive position of domestic corn oil vis-a-vis imports using cheaper corn germ.

a. Key Findings

* Shifts in demand for white corn grains away from milling and toward more starch manufacturing are foreseen.

* Emerging changes in the consumption of rice and corn grits were graphically illustrated when imported rice pushed the retail price of rice below the retail price of grits in 1989.

* The milling and distribution of yellow corn grits in late 1989 verifies the magnitude of the grits shortage because this form of grits was definitely considered inferior by most grits consumers.

* Demand for poultry, poultry products and by-products is far beyond the local capacity to produce it, thus substantial amounts inflow to Region X from Cebu.

* Benefits from Region X's "hoof and mouth disease free" zone have still not materialized, although given prominence in some sectors.

* In Cebu, an operator of a small scale agricultural supply store operator provides a model for successfully servicing and helping organize backyard hog raisers who supply about 70% of the hogs to the Cebu hog market.

* Although market opportunities for hogs in Region X are promising, prospects for a vigorous livestock sector remain uncertain without substantial investments by both the private and public sectors

b. Major Problems

The major problems confronting piggeries varied by location and scale of operation. The backyard or small scale commercial piggeries in Region X emphasized: a) incidences of epidemics, b) low market demand for hogs during summer, c) inflow of native breeds of hogs from neighboring regions, and d) inconsistent quality of commercial feeds. For commercial piggeries in Region X major problems involved: a) the lack of local improved breeding stock, b) high percentage of losses during shipments to Manila, c) high cost of feed ingredients, d) inadequate hog vans to Manila and e) inadequate working capital.

In Cebu, incidences of epidemics, especially during the rainy season, affected both types of piggeries with backyard raisers also concerned about limited working capital. Whereas commercial piggeries were more adamant about high costs of production and inadequate supply of corn from Mindanao during this season. Poultry operations in Region X were affected by: a) inadequate supply of day-old chicks, b) inconsistent quality of commercial feeds, c) incidences of epidemics and d) inadequate working capital; whereas those in Cebu cited: a) inadequate supply of corn from Mindanao, b) high costs of production and c) incidences of epidemics.

6. Vertical Linkages

There are at least four important inter-level phenomena that have hampered the expansion of the corn system.

"Wet corn" originates at the farm level but causes serious health hazards to the consumers of grits as well as the animals fed contaminated feeds. Likewise, its tendency for rapid aflatoxin contamination makes long distance shipments problematic because the poor quality upon arrival may be rejected, thus causing trader/shippers considerable financial losses.

Yet, from a supply side perspective not only the lack of drying facilities at the barangay and poblacion levels but also inadequate pricing incentives for good quality corn cause this problem to persist. Likewise, the large number of trader/shippers and their fierce competition in the spot market of Cagayan de Oro City make the sale of most qualities so likely that no one wants to forego a potential purchase, especially during shortages. From the demand perspective since certain processing technologies can handle wet corn, hog raisers can feed their animals fresh wet corn, and Cebu millers can mix wet corn with dry corn before milling, why not ship it to them?

"Inadequate, timely information on corn demand and supply conditions" persists at the government level. Although larger scale Integrators invest in and have access to such information, they do not share it with others, including the government sector which has not invested sufficient resources in sustainable information collection, processing and dissemination services. Those

most severely affected by this condition are those without access to the information nor the influence to benefit by corrective actions when serious problems arise.

For example, when imports were authorized and allocated, the big Integrators in Luzon were most likely to receive the first and largest share of imports. Those opportunities accrued to them even though they could have forewarned the government of this substantial increase demand for grain and enabled the public sector to take corrective measures in time.

Another dimension is the scarcity of information accessible at the regional and provincial offices of various government agencies. Some regional offices, such as FPA, have boxes of raw data that are not processed or organized in any fashion after the original materials are sent to the Central Office. Other offices cannot release information without special permission. And most frequently, the person in charge of the information is not around on a regular basis, consequently it is locked away for uncertain periods. This situation not only increases the costs of research but illustrates the lack of local information for use by marketing participants or local government officials.

"Broken bridges" on the main highway to Wao not only reduced farm incomes and increased trader risks and costs but also disrupted end-users ability to acquire timely supplies of corn. The location of the problem was site-specific but its impact went far beyond that place. In fact, the historical slowness of infrastructural development in Bukidnon was a major reason why large agri-businesses invested in General Santos more than in Region X.

"Separate but dependent" seems to be the position of the Luzon-based end-users of corn, however, until now they have made very little investment in supply side improvements yet become very vocal about corn shortages or high prices. That theme is replayed almost every year when the imports are petitioned. Recent developments whereby Integrators are establishing poultry contracting arrangements in Mindanao, chartering their own vessels and discussing local buying and shortage schemes with trader/shippers may signal the start of an effective form of end-user support for corn suppliers. Clearly, some problems in the supply areas require investments and contacts beyond that level if inter-level problems are to be resolved.

B. System Performance

Effectiveness and progressiveness were the two attributes with which the team evaluated the performance of this corn commodity system. Effectiveness means ability of the system to match demand preferences with corresponding characteristics of supply while progressiveness refers to more economical technologies, enhanced institutional capabilities, improved infrastructure and better management techniques. For Region X, the corn system is effective only in that market signals and incentives reaching the supply areas have produced a corresponding response but in a lagged fashion.

Prices of less than P 2.50/kg were received by many corn farmers in such places as Wao during the peak harvest of 1988. This followed a pattern of ever decreasing real prices for corn in the July to September peak harvest season and signaled farmers to plant less corn in early 1989. Consequently, several farmers shifted to higher valued crops, such as sugarcane.

The decreased production of corn was not only due to less corn area in Northern Mindanao but also caused by typhoon damage to the large corn crop in Cagayan Valley of Luzon. Yet, demand for feeds has increased following strong demand for meat. Farmers and traders responded to the resulting high prices by harvesting and shipping corn to end-users as rapidly as possible. Again the response matched the signals. However, the "lagged timing" effect remains - next year's planting of the first crop will be responsive to the price during this peak harvest season. Consequently if major buyers, such as the Integrators and starch manufacturers, do not ensure a strong market during each peak harvest season, why should they expect growers to expand production?

This study's agenda for action and research identifies potential opportunities for strengthening and stabilizing the corn commodity system and the feed sector, especially during the lean months for corn. Without such strengthening perhaps imported meat should be considered whenever feeds cannot cope with the timing of demand for animal production.

The Manila-based associations of end-users have been effective in compensating for the corn shortage by successfully petitioning for, acquiring and allocating imported corn among their Luzon-based members during late 1989. Although this situation indicates the system's ability to correct for corn shortage for a select few, serious questions remain regarding equitable treatment of different end-users and distant corn growers during the lean months.

In Cebu, corn millers have been experiencing increased difficulty in procuring adequate "good" quality corn grain. Thus, at least four corn millers diversified their business into corn trading and established buying stations in Mindanao ports in order to improve quality and quantity of the grain reaching them. That is an indicator of improved system effectiveness.

Progressiveness was found in the infrastructure in terms of expanded, modern port facilities and increased shipping services between Cebu and Cagayan de Oro but seriously lacking in terms of the interior road network.

From a technology standpoint, corn sheller fabricators recently established in major corn supply areas have both mobile and stationary shellers with blower attachments to clean the corn. Recently introduced hybrid yellow varieties have improved performance in acidic soils. Although trials of white hybrid varieties show promise of yields similar to yellow varieties, their grain quality does not include the desirable flinty quality according to millers. Innovative local designs for mechanical dryers include locally manufactured burners fueled by local materials, such as corn cobs. Some of these burners have been fitted to imported grain dryers to replace burners which require petroleum fuels. Likewise, the team observed both new local designs for mechanical dryers as well as skillful modifications to old imported mechanical dryers.

A technology on the input side includes a small local firm which has used local ingredients to manufacture an improved type of organic fertilizer in direct competition with national brands. On the marketing side, trial tests of plastic straps to replace wooden pallets for shipping corn proved unsuccessful because of sabotage within the port area of Cebu rather than for any technical reason. Biogas technology is well-known and used by a select number of hog raisers.

The new slaughterhouse facility in Cagayan de Oro City illustrates the consequences of introducing an efficient technology but hindering its use and increasing cost to consumers of meat by charging very high rates in order to repay loans for its construction. Most of the technologies noted above are indications of progressiveness, yet many remain isolated achievements rather than full-scale production, distribution and technological accomplishments.

From an institutional perspective, a few promising indicators of progressiveness were found. The formation of local farmers groups in order to access formal crop loans are a case in point. Other farmers groups were formed to receive outside support for such equipment as shellers, threshers, and/or small rice mills. If they survive and thrive, these will be positive signs of institutional progressiveness in Northern Mindanao.

Another example of institutional flexibility is the formation of an association of hog and poultry raisers in Cebu for the main purpose of accessing imported corn. Unfortunately, this is symptomatic of crisis response to a problem faced by the industry rather than a constructive trend of mutual cooperation for continued improvements. It was reported that individualistic, business attitudes still prevail among the members of that industry. Existing local institutions of a commodity nature, such as the Oro Grains Association, tasked to provide a "voice" for the industry have had limited impact given minimal active participation by its membership whereas similar types of Manila-based associations have been more progressive in perspective.

Opportunities for progressiveness abound for the hog and poultry raisers if the proposed meat packing plant, breeding center and feed/diagnostic laboratories materialize. However, currently those sectors remain set in their "business as usual" mind-set.

III. AGENDA FOR ACTION AND RESEARCH

The "Agenda" applies three agricultural marketing improvement strategies to priority problems/opportunities for the corn commodity system originating in Region X supply areas and extending to major demand areas, such as Cebu. The components of the "Agenda" include responses to system-wide priority problems, location-specific reactions to supply or demand area problems, and practical methods for resolving or exploiting more narrowly defined problems/opportunities.

A. Improvement Strategies

Since each of the three strategy options provides a somewhat distinct point of view relative to the problems/constraints encountered or opportunities envisioned, the strategies were prioritized as follows:

1) increase the value-added to the corn grown in Bukidnon and adjacent provinces - for example, increase hog and poultry raising, meat processing, corn oil and starch processing, and the like;

2) reduce the costs of growing and marketing corn and corn-related commodities in Bukidnon and adjacent provinces in order to improve farm income and prices - for example, increase availability of low cost lime, replace wooden bridges with low carrying capacity with concrete bridges, repair "soft spots" on major access roads, increase availability and reduce fees of tractors hauling corn from interior

barangays or preparing land for the second cropping season and the like; and

3) improve corn quality and expand the market outlets for corn grain/products from Region X - for example, reduce moisture content for longer storage and high quality demanded by distant end-users, make production contracts with ~~distant end-users to insure~~ good quality and adequate quantity, and the like.

B. Problem Prioritization, Implications and Possible Alternative Actions

The three-way analysis of problems/constraints as: 1) expressed by individual marketing participants, 2) hampering the flow of commodities, money and information, and/or 3) inhibiting the effectiveness and progressiveness of the marketing system, was focused on prevailing local conditions and referenced to the strategy options above. In addition to that analysis, two presentations before local groups solicited insights for the problem prioritization process, particularly from the perspective of priority local concerns.

The resulting priorities varied markedly by location, for example, marketing participants in the supply areas emphasized the shortcomings of national policy and local infrastructure; those in the Region X trading center of Cagayan de Oro focused on inadequate vessels for shipping corn to Manila and this year's reduction in corn supply; and those in the Cebu demand Center for white corn grain were vocal about this season's critical shortage of grain, high moisture content of Region X's first crop of corn, and lack of vessels. Consequently, the system's perspective was used to synthesize the following ranking priority problems while specifying "supply area versus demand area" implications, action, research and approaches to implementation.

1. Substantial Shortages of White and Yellow Corn Grain

This condition created a "sellers market" throughout the commodity system beyond the farm-gate with serious consequences for end-users of white corn grain, in particular.

Implications:

"Supply Areas"

* uncommonly high farm-gate prices for corn in this sellers market during the peak harvest period quickly drew most harvests and stocks from the supply areas in such volumes that the major access road and bridges to interior supply areas were badly damaged and locally held inventories were uncommonly low;

* local commercial corn millers initially received expected supplies of grain but subsequently faced critical shortages of grain for milling during the upcoming lean months;

* local hog raisers and poultry growers were vigorously searching for substitutes for corn in their feeds.

"Demand Areas"

* corn grits produced by Cebu millers became more costly, supplies more scarce, and increased incidences of contamination were cited, compared to any similar season during previous years;

* prices of corn-based feeds rapidly increased with particularly adverse effects on commercial and backyard poultry growers and on the short term supply of poultry and hogs;

* limited inventories of white corn grain for Cebu corn millers caused inflated values for wet (sometimes contaminated) corn grain for milling with adverse health consequences for consumers of grits;

* drying corn grain in the supply areas was marginally beneficial during the first cropping season of 1989 due both to the narrow value differences between wet and dry corn and the ability to quickly sell wet corn because of strong demand and rapid shipment from Cagayan de Oro to Cebu where it was mixed with drier corn from South Cotabato before sale and/or use;

* rumored importation of yellow corn for feedmillers near the end of the peak harvest induced a sharp fall in the price of yellow corn grain while white corn maintained its previous price;

* several millers processed yellow corn grain into grits and sold it to local consumers for the first time.

Action:

Programs to increase the supply of corn could take several forms including:

* the Department of Agriculture (D.A.) could replicate the rice program whereby sacks of corn would be exchanged for sacks of fertilizer (subsidizing inputs) on a short term basis;

* Department of Agriculture could provide technical, marketing and/or coordination support for farmers groups willing to engage in contract/financing schemes with corn millers in distant demand areas (special attention to promote locations with concentrated and exclusive production of white varieties to avoid cross pollination with yellow varieties);

* donor agencies could support projects designed to increase traction power for interior corn growing locations for the second cropping season, thereby reducing production costs while increasing land cultivated to corn prior to the lean months;

~~* NGOs or the Department of Agriculture should orchestrate market development efforts,~~ for example, during the January to May lean months for corn; find feedmillers and hog and poultry raisers willing to guarantee market security (i.e., minimum price and purchase of all acceptable quantities) for farmers growing new feed crops, such as sorghum and cassava; and

* Department of Agriculture should provide better coordination of crop substitution efforts with other agencies, such as the Sugar Regulatory Agency, especially when the substitute crop becomes detrimental to farmers' livelihood, as with the case of new lands planted in sugarcane beyond the local sugar mill's capacity.

Likewise, other agencies should be alert to processors behavior during such shortage situations in order to avoid problematic "side-effects", such as the Department of Health's need for stricter enforcement of health regulations regarding frequency of aflatoxin contamination.

Research:

Research is needed to develop and put into place an early warning system for predicting both shortage and surplus conditions for staple food crops.

Given the poor performance of white compared to yellow hybrid varieties there is the need to accelerate R&D for improved OPV and hybrid white varieties, especially with flinty grain characteristics suitable for corn milling. Screening of improved varieties during crop research should focus on selection criteria compatible with "use" characteristics rather than only yield potential or disease resistance.

Research on feed ingredient substitutes for corn should be coordinated with farming system research/extension programs in order to provide farmers who are too specialized in corn production with profitable alternative or complementary crops. Research on crop production profitability and hog/poultry feed substitutability must be merged by "market development" efforts so that such crops as sorghum, cassava and cowpea grown by farmers will be procured by animal raisers on a regular basis.

The indications of the strong market for starch (processed from white corn) and the relatively few Asian countries growing white varieties call for an analysis of the starch industry, covering both domestic and regional markets. The demand aspect should focus on the potential export market while the supply dimension examines the consequences of large scale procurement by starch manufacturers that directly competes with corn millers and feedmillers during this period when there is a shift from white to yellow varieties in Bukidnon.

Approach:

The adverse consequences of this shortage situation suggest the future need for developing an "early warning system" and conducting an early assembly of major participants in the corn commodity system in order to predict the consequences for each type of participant in the supply and demand areas, to evaluate alternative courses of action and to begin a policy dialogue on the implementation of major corrective actions. In fact, the current crisis situation provided the opportunity for bringing all concerned parties together for meaningful dialogue and cooperation for formulating long term improvements.

2. Insufficient, Inefficient and Damaged Infrastructure/Vehicles

This situation continues to stifle the development of a vigorous, low cost corn commodity system, especially given:

- a) continued shortage of vessels for timely shipments of corn grain during the peak, July-September harvest season, primarily from CDO to Manila and South Cotabato to Cebu;
- b) high rate of grain losses in the Cebu City port during their peak period of arrival;
- c) continued delays in concretizing the bridges and repairing soft spots on the major access road to Pangantucan, Kalilangan and Wao production areas; and
- d) shortages of traction power (tractors) for hauling corn and preparing land for the second cropping season for corn in the provinces mentioned above.

Implications:

"Supply Areas"

- * the unanticipated delays in arrivals of wet corn due to bridge or road damage caused serious deterioration of corn grain;
- * the irregular and insufficient availability of vessels substantially extended holding periods for grain while tying-up working capital needed for buying more corn from farmers as well as hampering the ability of supply area traders to respond to end-users purchase requirements;
- * during the second cropping season at least another 10-20% land area was not cultivated to corn in the Pangantucan, Kalilangan, and Wao municipalities because of the scarcity of traction power (tractors) during the short period between corn harvests and land preparation with heavy, intermittent rainfall patterns.

"Demand Areas"

* irregular practices affecting shipping vessels docked in Cebu increased the costs of Cebu grains which the consumer must pay for in terms of more costly and poorer quality local grits;

* impassable interior roads during the rainy season cause irregular arrivals of grain from supply areas, thereby increasing the uncertainties regarding the timing of deliveries to major demand areas;

* irregular and hard-to-find shipping services from South Cotabato to Cebu result in delayed arrivals of dry white corn to Cebu millers and thereby hamper milling efficiency and forces more dependency on wetter corn grain from CDO.

Action:

"Supply Areas"

* given the current availability of funding for these interior areas, recruit construction contractors who can rapidly complete quality road and bridge construction during the dry season with the active support of locally influential persons;

* develop a pilot farm mechanization project with 20 imported, rebuilt tractors with spare parts and implements, comparing the distribution and monitoring and evaluation of tractor operations under three different types of ownership/management arrangements (i.e., ownership as a "pool of tractors" managed by a university's on-farm-research/extension program and a farmer's association versus individual entrepreneur's "lease to own basis") and within two situations, i.e., opening of new land for corn cultivation and supplemental land preparation during the second cropping season for interior settlement areas;

* encourage the establishment in Region X of large scale feedmillers and hog/poultry raisers, because they not only can finance transportation and storage improvements as well as access better quality corn but also will become less anxious to import corn once they make such investments.

"Demand Areas"

* improve the security at the Cebu City port by setting-up an oversight committee consisting of both local leaders and representatives of Mindanao trader/shippers who pay for losses incurred at the port;

* search for other docking options for corn shipments from Mindanao during the peak months.

Research:

The large land areas, low population density, limited capital for investment in new machinery and scarcity of traction power in Northern Mindanao suggest undertaking a feasibility study for a program to import rebuilt tractors and used equipments. Pertinent information about costs, internal rates of return and problems with implementation would be gleaned from monitoring and evaluating the pilot imports described under the Action Agenda above.

Approach:

Continued improvements in the shipping and port facilities are said to be in progress following the findings and recommendations of the national task force. Yet, more challenges to existing regulations are required, rather than rhetoric, if the corn commodity system is to become competitive with neighboring countries.

On the other hand, the prospects for early replacements/repairs of interior bridges and roads are less bright without self-help approaches and/or cooperation from the local population. Likewise, finding and recruiting qualified contractors and establishing a proper liaison with local leaders require a vigorous effort than the usual "wait and see" or "let the other guy do it" attitudes.

Another dimension of local cooperation for the common good would involve several CDO traders grouping together to charter a large tramp vessel at economical rates and to sponsor a Manila or Cebu-based broker to arrange backhauls for that vessel to Mindanao.

A project approach is needed for the procurement and distribution of rebuilt tractors/implements. That project requires the active involvement of both the public and private sectors, can be packaged as a proposal for outside funding with active D.A. support and should benefit both institutions and individual farmers.

3. Insufficient Post-Harvest Drying Capacity During the Rainy Season

Implications:

" Supply Areas"

* semi-wet and wet corn enters the marketing channels at relatively low value, had a short shelf-life, is highly vulnerable to "aflatoxin" contamination, creates problems in estimating value and shrinkages during transit, and involves additional costs to transport the excess moisture (water);

* mechanical shelling of wet corn causes higher level of grain breakage and thereby increases frequency and severity of aflatoxin contamination;

* wet corn has a lower farm value and is difficult to sell whenever a "buyers market" condition prevails.

"Demand Areas"

* milling semi-wet or wet corn can damage machinery if the moisture is not reduced by mixing the wet with dry grain (few demand area traders or millers have any dryers);

* grits with a high moisture content have a short shelf-life and thus cannot be shipped to distant markets without substantial deterioration;

* grits or feeds made from wet corn are especially susceptible to deadly aflatoxins.

Action:

* develop a program for financing multi-purpose drying floors at the barangay level, especially in Kalilangan with its heavy rainfall pattern and easily damaged access roads;

* provide incentives and management training for 2 to 3 entrepreneurs to set-up a large scale multi-commodity, mechanical dryers for use during the peak harvest of corn and other crops requiring drying, especially in the Wao and Kalilangan areas;

* encourage farming system researchers to develop cropping patterns that enable location-specific staggering of corn harvests and use of dryers versus simultaneous harvests beyond the capacity of local dryers.

Research:

Research should include innovative ways to contend with this age-old problem, such as the development of an inexpensive, heat-reflecting type of tarp to be spread on the ground and serve as a mobile solar dryer for farmers' crops/commodities. Likewise, research is needed for identifying inexpensive and effective ways to eliminate or reduce aflatoxin contaminated in grain.

Approach:

Combine several approaches, such as, support for farmers groups, individual entrepreneurship, self-help efforts and the like with flexible, appropriate responses to varied situations found in each barangay. For example, in barangays with public land available, select those with interested and active barangay leadership and provide cement to which the barangay provides counterpart land, gravel and labor for actual construction.

If only privately owned land is available for suitable solar dryer sites, enter into an agreement whereby a farmers' group is given the right to use the dryer for a five year lease period before it reverts to the land owner for his/her own business use. This form of privatization helps insure maintenance and continuity of the service for the longer run and is compatible with divergent land ownership patterns. Likewise, with this participatory approach the group provides its labor for the construction while the funding program delivers the required amount of materials under a 3 year loan arrangement.

4. Insufficient Availability and Access to Timely and Accurate Marketing Information.

Implications:

* agricultural policies tend to react to or "catch-up" to events or situations rather than plan for and guide events;

* rumors create and/or perpetuate information of questionable quality which does not infrequently lead to confusion and traders' premature withdrawal from markets during periods of price decline;

* uncertainties at all levels of the marketing channel as prices decline during the peak season encourage traders to maintain wider margins than during other periods, thereby reducing the farmgate price they bid;

* lack of "information banking and retrieval practices" by provincial and regional officers of public sector institutions seriously inhibits informed decisions by local policy makers, RAFC members, and researchers.

Action:

In each major demand and supply area the Chambers of Commerce would form a five person of locally knowledgeable, corn industry businessmen representing farmers, traders, corn millers, feedmillers and animal raisers. These panels would meet with a BAS "corn information team" prior to each major harvest period. Prior to the panel meeting the BAS team would conduct a rapid reconnaissance of major production areas and the Chambers would meet with their knowledgeable members so that each group brought useful information to this review of the current supply and demand conditions. The results of those panel discussions would be reviewed and become part of a quickly and widely distributed market situation newsletter.

An institution experienced in data collection and processing should devote manpower and funds to assist regional and provincial offices of government agencies to design simple and reliable methods for local "information banking retrieval". However, the office receiving such assistance would have to guarantee to have someone there on a regular basis to manage information and make it accessible to local officials and researchers instead of only sending the data to its Central Office.

Several large traders find the information on the inflow of corn and corn related products so important that they send data collectors every day to the port to record corn arrivals and departures. Given its verified importance, can the Bureau of Agricultural Statistics organize daily collection, processing and display of such information for both small and large scale marketing participants as well as government agencies?

Research:

Formation and training of rapid reconnaissance teams require both skills in research techniques and an up-to-date understanding of production conditions and the formation and behavior of marketing channels. Research and development activities focused on preparing such teams should include flexible sampling frames to estimate or project supply by location. Such estimates will lessen uninformed impacts of rumors, prepare for informed policy responses, and provide relevant industries time to adjust procurement strategies.

Approach:

In line with the BAS mandate and its distribution of personnel throughout most of the provinces of the Philippines, the formation and backstopping of such teams in combination with trained local Price Information Collectors/Analysts should be extremely timely and appropriate. Once collaborative panels between the Chambers and BAS are operationalized and beneficial to both groups, timely and accurate marketing information will be substantially improved.

5. Inadequate Working Capital and High Costs of Formal Credit

Implications:

* cash strapped, white corn farmers who want to shift to high yielding, hybrid varieties are prevented by the high cost of seed and fertilizer used for the hybrid technology, thus shortages may persist;

* sheller fabricators and inventors of agricultural implements cannot reduce the costs of their farm products by bulk purchases of metal due to insufficient access to working capital, especially in interior areas;

* commercial piggeries require substantial amounts of working capital for feeds, improved breeding stock and marketing to distant demand areas, yet, as death occurs due to diseases, temporary prices drop in live hogs or increases in feed costs can exhaust their working capital reserves;

* small to medium sized traders continually search for additional working capital during the harvest season but usually find it scarce or too expensive.

Action:

* the Department of Agriculture could design more innovative fertilizer and seed assistance schemes exclusively for small farmers;

* though their buying stations in Cagayan de Oro distant corn millers could contract with the finance groups of small farmers to grow improved, open-pollinated varieties of white corn;

* Land Bank and local governments could sponsor or initiate institutional development programs for farmers groups by training in value formation, agri-business techniques and cooperative approaches to technology adoption;

* the lack of security in taking large sums of cash into interior areas substantially increases the "costs of money" in such places, thus government supported programs for insuring the delivery of cash to rural banks would be one method for reducing that cost on money;

* the Cagayan de Oro Chamber of Commerce and Industry could sponsor seminars for private traders on existing credit programs available in the region and for hog/poultry raisers on appropriate financial management practices, especially regarding working capital.

Research:

There is limited research information available on the comparative credit situation for farmers of similar resources for one group located in interior versus roadside barangays. A better understanding of the costs associated with inaccessible versus accessible farms and methods for effectively reducing costs experienced in both situations is needed, especially now that the value of infrastructure is becoming more prominent.

Approach:

Government credit programs should be designed to discourage the "subsidy seeking" behavior of farmer borrowers, thus avoiding the pitfalls of previous programs.

Chapter I

INTRODUCTION

This study aims to provide an overview of the corn commodity system as it originated from the supply areas in Region X and extended to the major demand areas in Cebu and Manila (Figure 1.1); identify, diagnose and prioritize problems in that commodity system; and prepare an Agenda for Action and Research as well as suggest ways to approach alternative solutions. The research used the Marketing Assessment methodology. This involved a commodity systems approach to the identification and analysis of the complex and interrelated problems within the production, distribution, processing and consumption levels. The study completed Phases I and II of the four-phased Marketing Assessment methodology, and designed proposals for Phase III.

This chapter defines the general and specific objectives of the study, the research methodology used, and the institutional affiliations of those who commissioned, participated in and supported the study. It presents the scope and the sampling frame as well as the limitations of the study.

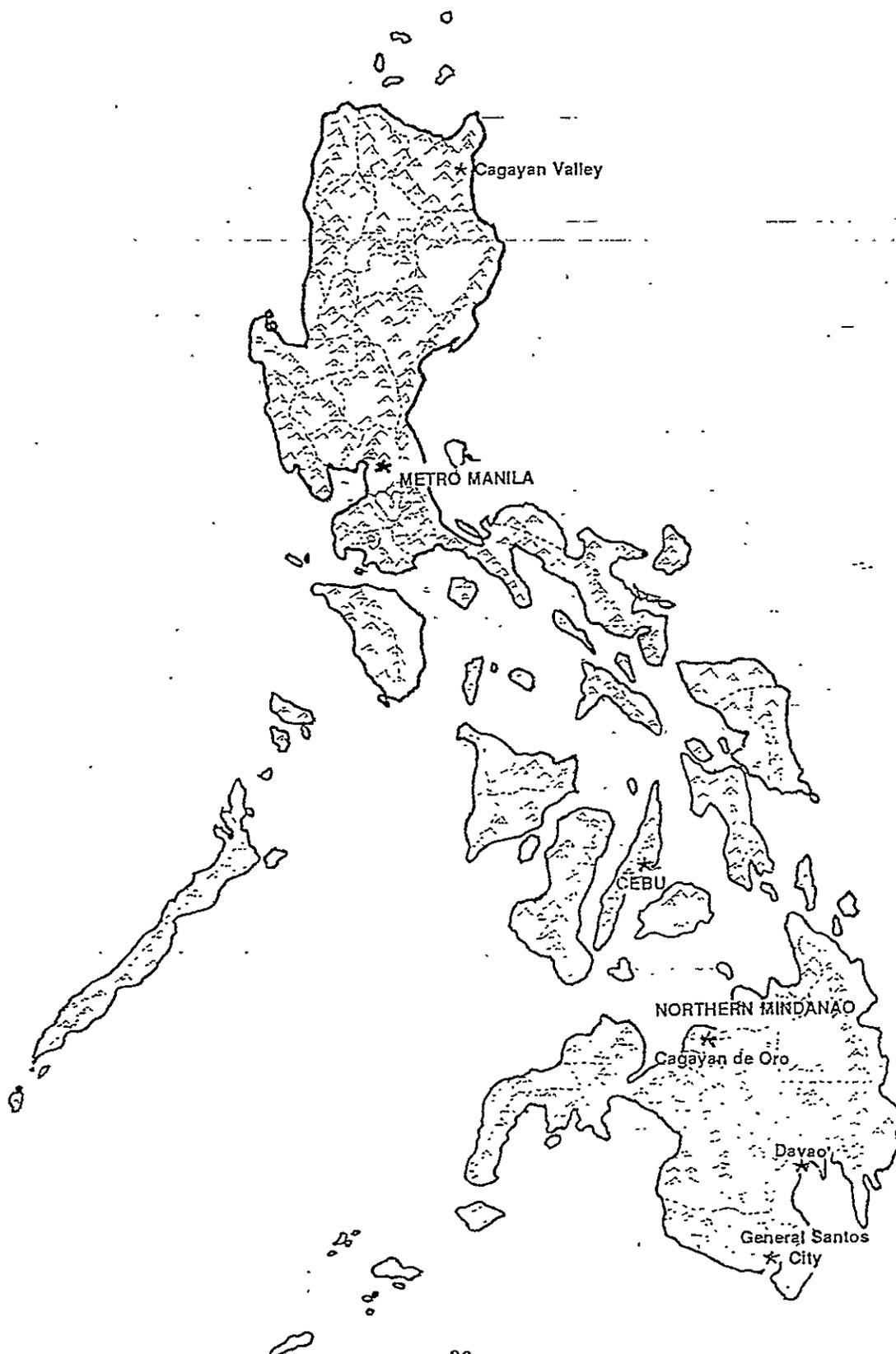
A. Objectives

The general objective of this study is to describe and analyze the organization, operation and performance of the corn marketing system. The specific objectives are:

- o to present an overview of the corn commodity system as it originated from the supply area in Region X and extended to the major demand areas;
- o to identify and diagnose problems/constraints of the system participants considering the system's effectiveness and progressiveness as well as productivity and profitability;
- o to prioritize problem areas that require follow-up, in-depth research and analysis for the identification of alternative solutions; and
- o to suggest ways to approach alternative solutions to priority problems in the corn commodity system.

Figure 1.1

The Philippines: Research Sites



B. Research Methodology

The study completed the first two phases of the "Marketing Assessment" research methodology. Phase I focused on the collection and analysis of related Background Information. Phase II involved the conduct of a Rapid Marketing Appraisal (RMA) for system overview and problem identification. The commodity system's approach in the Marketing Assessment methodology identifies and examines the complex and interrelated set of issues and problems from each perspective within the production, distribution, processing and consumption levels. Various types of key informants and marketing system participants were interviewed. The study also designed proposals for Phase III which consists of the in-depth analysis of priority problems. A more detailed discussion of the RMA approach is contained in Attachment A.

1. Team Composition

The Project Core Group (PCG) responsible for the overall supervision of the project was composed of four officials from the Cagayan de Oro Chamber of Commerce and Industry Foundation, Inc. (Oro Chamber), four academic members of the Don Mariano Marcos Memorial Polytechnic State College (DMMMPSC), and a senior official of the Department of Agriculture, Region X. An interdisciplinary team was selected and trained in the Rapid Marketing Appraisal methodology in order to conduct field interviews, to make detailed observations of corn production/marketing functions, and to analyze the information gathered. An agricultural marketing specialist from the Accelerated Agricultural Production Project (AAPP) of the Department of Agriculture supervised and guided the research team. The interdisciplinary team was composed of a principal investigator, two senior and six junior researchers and one administrative staff. A local consultant researched the hog industry. In addition, two marketing specialists from the Bureau of Agricultural Statistics (BAS) Central Office and a market information staff from the BAS Bukidnon Office partly joined the field interviews. An agricultural marketing consultant from the Agricultural Marketing Improvement Strategies (AMIS) Project of the USAID reviewed the findings of the study. Appendix 1 illustrates the institutional affiliation of the individuals who supported and participated in this research.

2. Implementation Strategy

The marketing system participants, as the primary source of information at every stage/level in the commodity system, were selected for interviewing by using a "compare and contrast" sample stratification procedure. Sample selection started at the farm level. The research team began in ten sample barangays within the supply provinces of Bukidnon, Misamis Oriental, and Lanao del Sur,¹ and traced the flow of corn through the various channels leading to Cagayan de Oro City and extending to the major demand area of Cebu City.

¹ Wao municipality in Lanao del Sur Province of Region XII was included because its corn harvests contributed a major share of corn flowing to and through Region X.

Respondents within the supply and demand areas included farmers, traders, "canvassers", corn millers, feedmillers, input dealers, feed ingredient dealers, hog raisers, poultry growers, slaughterhouse operators, hybrid seed company managers, starch manufacturers, corn oil manufacturers, noodle manufacturers, corn sheller operators, sheller fabricators, and shipping company operators. Key informants were officials from government agencies, namely, Department of Agriculture (DA), National Food Authority (NFA), Bureau of Agricultural Statistics (BAS), Philippine Ports Authority (PPA), Land Bank of the Philippines (LBP), and representatives from other public sector institutions. Likewise, discussions were held at the academic institutions of Central Mindanao University (CMU) and Misamis Oriental State College of Agriculture and Technology. Also interviewed were the officers of private sector groups, such as the Oro Grains Association, Cebu Millers Association and the Confederation of Rice and Corn Millers' Association of the Philippines (CONFED).

The questionnaires and checklists were based on the following interview frame: a) firm identification, b) competitive environment of the firms, c) the firm's relationships with its suppliers and buyers, d) the firm's internal operations, and e) probing questions about problems within the firm and its industry, along with their "perceived" causes and effects.

The research study has the following major components: a) Background Information; b) the Crop and Commodity Characteristics at the Research Sites; c) Marketing System Organization; d) Marketing System Operation; e) Economics; f) Infrastructure; and g) Institutions and Power. Those components are followed by an analysis of the "Problems and Constraints" of the commodity system and a proposed "Agenda for Action and Research". In addition, a special case study of the Hog Industry highlights opportunities for implementing a value-added strategy for Region X.

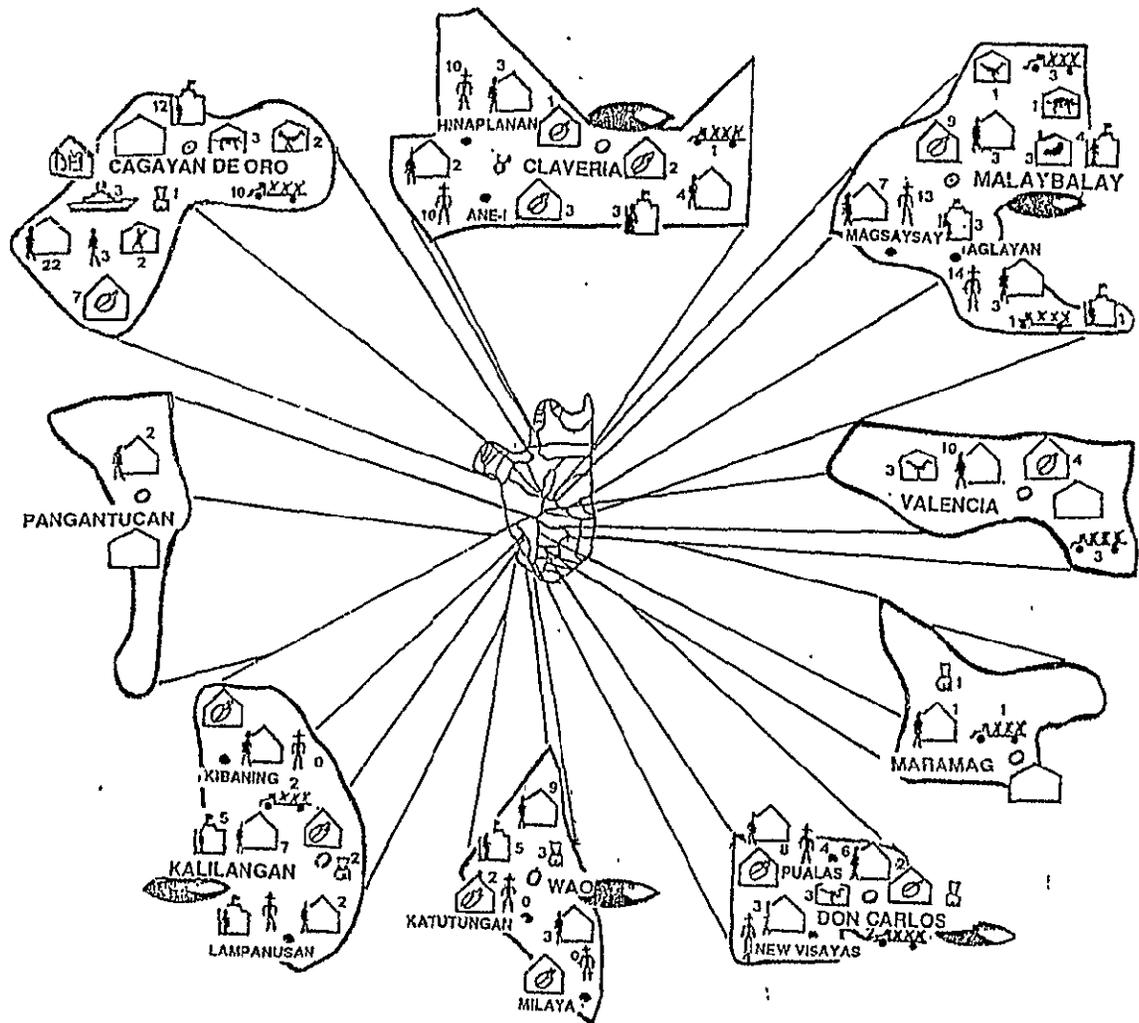
Mid-term and final presentations of the research findings and analysis were conducted with concerned institutions at the regional level and the project management group at the national level in order to integrate and incorporate the viewpoints of these various groups in the final report.

3. Sampling Frame and Coverage

The "tracing" sampling procedure covered a total of five municipalities with major corn production areas, i.e., three municipalities in Bukidnon Province, one in Misamis Oriental Province, and one in Lanao del Sur Province. For each municipality, two barangays were chosen. The tracing extended to the municipal trading centers up to Cagayan de Oro City and finally to the demand area of Cebu City. This progression provided a complete picture of the commodity system, particularly for white corn.

A total of 404 sample respondents were interviewed in the Northern Mindanao region and Cebu (Appendix 2a - 2c). The 350 respondents in Northern Mindanao region were composed of 115 farmers; 106 traders; 34 corn millers; 34 key informants from public and private institutions; 23 input suppliers/dealers; 18 hog and/or poultry raisers; 2 feedmillers; a corn oil manufacturer; 8 corn sheller operators; 3 sheller fabricators; 3 seed companies and 3 shipping company operators. In Cebu, the 54 respondents consisted of 7 corn millers, 7 traders, 3 feedmillers, 11 hog and/or poultry raisers, 3 feed ingredient dealers, 3 starch manufacturers, 3 noodle manufacturers, 5 shipping company operators, 2 input dealers, 7 institution/key informants and 3 slaughterhouse operators. The distribution of the sample by location and type is displayed in Figure 1.2a - 1.2b.

Figure 1.2a Distribution of RMA Interviews by Type of Respondent per Sample Site in Northern Mindanao, October, 1989



PROVINCES OF MISAMIS ORIENTAL & BUKIDNON REGION X

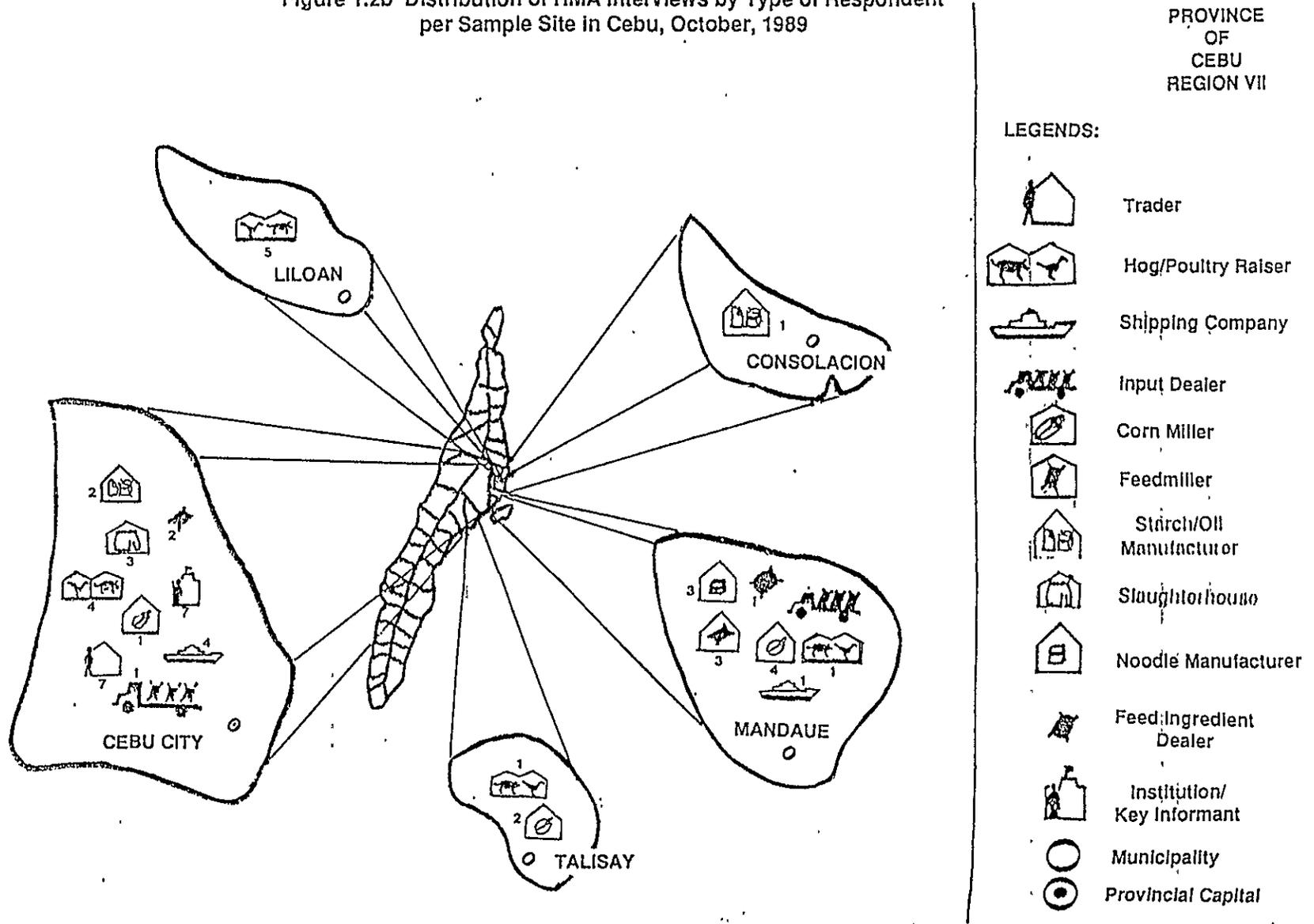
LEGENDS:

- Major Corn Growing Municipality
- Trading Center
- Farmer
- Trader
- Canvasser
- Hog Raiser
- Poultry Raiser
- Shipping Company
- Input Dealer
- Corn Miller
- Feedmiller
- Starch/Oil Manufacturer
- Seed Company
- Sheller Fabricator
- Institution/Key informant
- Barangay
- Municipality
- Provincial Capital

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Figure 1.2b Distribution of RMA Interviews by Type of Respondent per Sample Site in Cebu, October, 1989



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C. Limitations

The methodology required the conduct of field interviews within a very short span of time, yet covered a wide range of interrelated subjects. Limitations included the difficulty in obtaining adequate information from secondary data sources and, in many cases, incomplete responses from the larger firms.

Limited time and resources did not permit full scale field research in Manila. Nonetheless, a considerable amount of primary data about Manila traders and end-users were gathered from marketing participants in Cebu and Northern Mindanao. These interviews compensated for much of that limitation.

The acute corn shortage which resulted in high prices during the first cropping season of 1989 limited the team's ability to document the impacts of low prices on farmer's profits and access to the P 2.90/kg support price during the peak harvest season. On the other hand, this situation provided first hand evidence of the impacts of imports on buying prices for yellow corn and market behavior in anticipation of imports.

Chapter II

BACKGROUND: THE CORN NATIONAL SITUATION

Corn is the second most important crop in the Philippines because of its economic and political impact in the farming sector and the food and livestock industries. Three major issues concerning corn still remain as challenges for policy-makers: the perennial shortage of domestic corn supply during the lean months relative to the year-round steady demand for feeds by the livestock industry; the inefficient corn distribution system given the geographically dispersed supply and demand areas within the archipelago; and the continuing subsistence level of the majority of corn farmers despite substantial efforts of the government to improve farm productivity and profitability. The 1989 first cropping peak harvest season which corresponded to the study period was marked by the highest level of prices in the corn industry. The "unusuality" of extremely high prices during that peak harvest season dramatized the acute shortage of corn. The sudden surge in demand for corn due to the rapid growth of the livestock industry simultaneous with the sharp decline in production during that main harvest season reportedly caused that price scenario.

This chapter provides a brief national situationer on corn, highlighting the importance of the crop, the supply and demand trends and patterns, and the relevant issues involving the commodity. It describes the prevailing national situation of corn when the research was conducted to help clarify the content and findings of the study within that particular time period and environment.

A. Importance of Corn

Corn has traditionally covered about half of the national grain area and about one third of the total crop harvested area (Appendix 3). From 1980 to 1989 (at constant 1972 prices), its gross value added in agricultural crops had an annual growth rate of 3.6 percent. Over that period, its annual share to gross national product had an average rate of 1.8 percent (Appendix 4). Corn farmers, who comprise about 1.3 million or one-third of the total Filipino farmers, plant white and yellow corn as their main source of income. White corn grits is a staple food for about one-fifth of the total population, mostly in the Visayan and Mindanao regions. Yellow corn is a major ingredient in the feedmilling industry which supports the rapidly expanding livestock and poultry sector. Corn is also used in manufacturing value-added food products such as corn starch, corn oil, glucose, noodles, and snack foods.

Due to the economic and political significance of the crop, the government gives high priority to increasing the productivity of corn lands and in improving the corn farmers' incomes. Corn is included under the Phase I coverage of the ten-year Comprehensive Agrarian Reform Program (CARP) currently being implemented.

B. Supply Trends

1. Production Volume, Area and Yield

Domestic production of corn increased from 3.1 million MT in 1980 to 4.5 MT in 1989. Over this period, the average annual growth rate of production was placed at 3.7 percent. Steady gains in national production started in 1984, but with varying increments. The most significant gains in the corn national output was posted during the 1985 to 1986 period, with a growth of 14.0 percent in volume and 6.9 percent in hectareage (Appendix 5).



The supply of corn continues to be dominated by small farms dispersed throughout the archipelago.

Total corn area increased from 3.2 million hectares in 1980 to 3.7 million hectares in 1989, or at an average annual rate of 1.79 percent. National yield was placed at 0.98 MT/ha in 1980 and 2.1 MT/ha in 1989, with an average annual growth rate of 2.1 percent.

2. White versus Yellow Corn Production

White corn has traditionally been more extensively cultivated than yellow corn, both in terms of area and volume of production. However, from 1980 to 1987, white corn's share to total corn area shifted from 86% to 76%. White corn's share to total production dropped more rapidly from 87% (1980) to 71% (1987), as its yield has normally been lower than that of yellow corn. In 1987, national yield of white corn was placed at 1.06 MT/ha while national yield of yellow corn registered at 1.43 MT/ha, according to BAS statistics (Appendix 5).

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3. Geographic Location of Supply

The bulk of the country's corn is produced in Mindanao, located at the southern most part of the archipelago (Figure 2.1). In 1988, Northern, Southern, and Central Mindanao (Region X, XI, and XII, respectively) contributed 66% to the country's total corn production (Figure 2.2). From 1986 to 1989, the top four corn producing regions in the country are: Southern Mindanao (Region XI), Central Mindanao (Region XII), Cagayan Valley (Region II) and Northern Mindanao (Region X) (Appendix 6).

C. Demand Patterns

1. Food versus Feed Use

Demand for the staple food of corn grits from white corn has been limited as compared to the soaring demand for feeds from yellow corn. During the recent lean months, white corn has been substituted for yellow corn by the feedmillers and hog and poultry raisers. Corn used as feeds increased from 50.4 percent of total corn demand in 1980 to 62.6 percent in 1987. From 1980 to 1987, demand for feeds had an average annual growth rate of 6.8 percent while demand for corn for food usage had an average annual growth rate of 2.0 percent (Appendix 7).

2. Geographic Location of Demand

The biggest demand for yellow corn comes from Luzon, located at the northern part of the archipelago. As of the mid-1980's, about two-thirds of the total registered feedmills were based in Metro Manila and its neighboring regions of Central Luzon (Region III) and Southern Tagalog (Region IV).

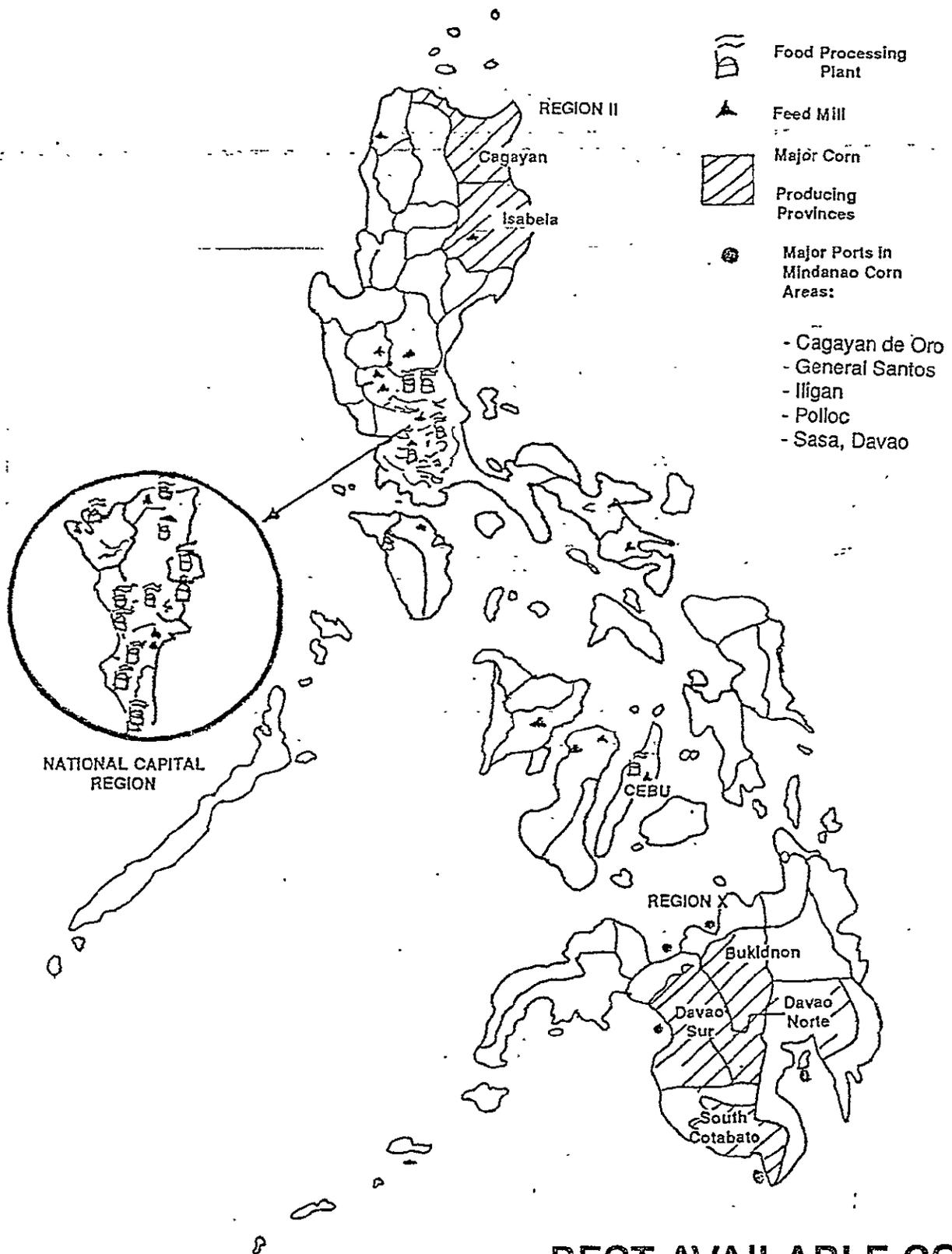
The second largest demand center for yellow corn but the biggest demand center for white corn is Cebu Province, located in the Central Visayas Region or at the central part of the archipelago. The Central Visayas Region is the largest consumer of corn grits as staple food. Approximately 10 percent of the total number of registered feedmills are in Cebu, which contributes 13 percent to the country's total production of mixed feeds.

3. Income Elasticity of Demand

On the effect of income relative to the demand of corn, studies show a negative income elasticity for corn grits as food and a positive income elasticity for meat. Thus, as incomes increase, consumers will tend to shift out of eating corn grits to eating rice for staple food. On the other hand, as incomes increase, consumption of meat will increase. Thus, corn has a comparative advantage in feed use rather than for processing into grits.

Figure 2.1

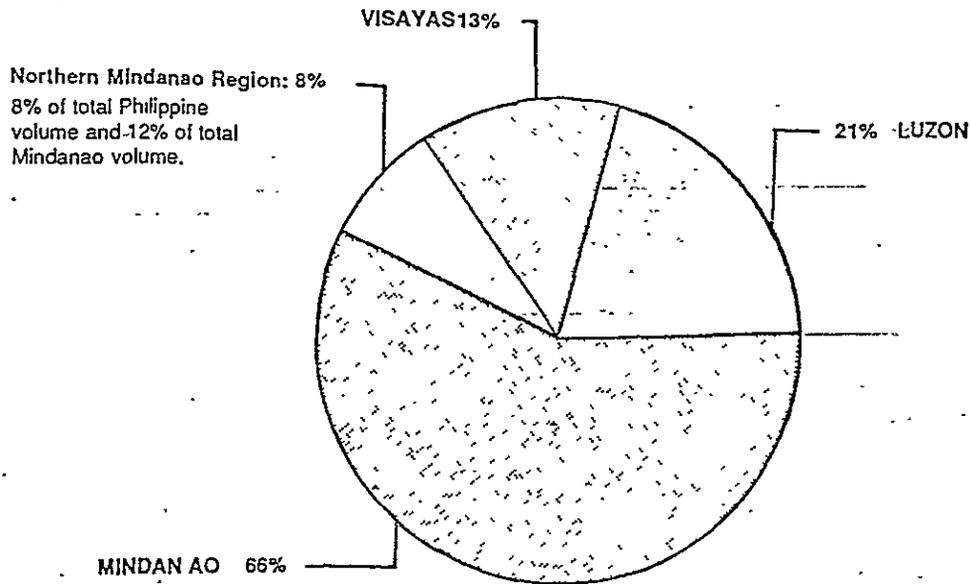
Major Corn Producing Provinces and Location of Livestock-Based Processing Firms and Feedmills



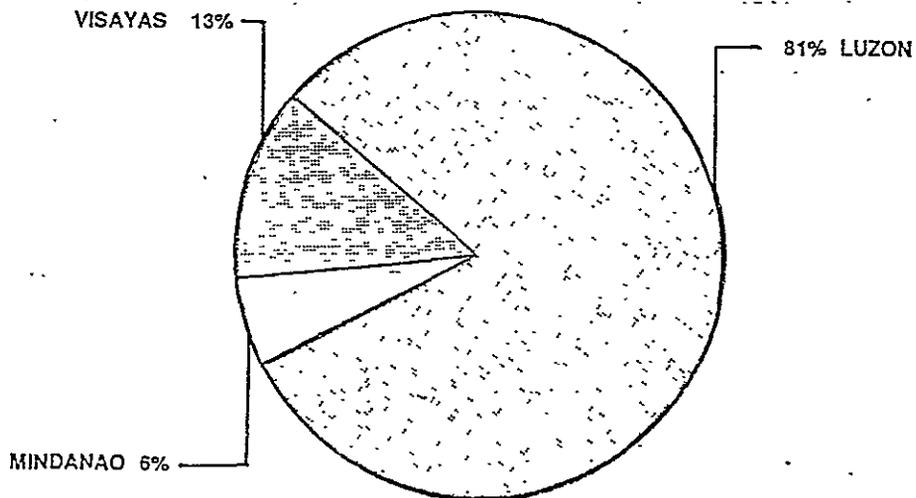
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Figure 2.2

Regional Distribution of Corn Production, 1988



Regional Distribution of Mixed Feeds Production, 1988



Source: Bureau of Agricultural Statistics

D. Related Issues

1. Crop Seasonality

The domestic supply of corn is generally largest during the peak harvest months from July to September and becomes tight from February to April. The extreme seasonality of the crop causes the market price fluctuations within the year. (Figure 2.3). Corn prices gradually rise during the lean months from January to June, abruptly drop during the peak harvest months from July to September, and then remain low until December. The crop seasonality—which affects behavior of corn prices has critical implications for the proper timing of corn import arrivals.

2. Inadequate Domestic Supply

The country has yet to attain self-sufficiency in corn. In the past, the strong demand for corn by the expanding livestock industry coupled with the damage due to periodic, adverse weather conditions such as typhoons, placed perennial strain on domestic stocks, prompting the government to import yellow corn. From 1980 to 1985, corn imports posted an average of about 295,000 MT/year or an average annual growth rate of 12.6 percent. In 1986, an import ban restricted imports to a minimum until the end of 1989. The country has been importing yellow corn from three major sources: Thailand, U.S. and China.

3. No Improvement in Real Prices of Corn

Over the last decade (1980 to 1989), the real prices of corn, i.e., its deflated prices using the 1978 Consumer Price Index figures as base, have remained at a fairly constant level despite the increases in nominal (current) prices within the period (Figure 2.4). This indicates that due to the inflation, the economic well-being of corn farmers showed no significant improvement for the past years. This poverty issue has remained a serious challenge for government policy-makers to address.

4. Low Production Performance in 1989

Year-end data from the Bureau of Agricultural Statistics show that between 1988 to 1989, national corn output rose by a marginal rate of 2.2 percent, as compared to a high 10.3 percent gain posted between 1987 to 1988. Likewise, the total area planted to corn slid by 1.5 percent between 1988 to 1989 whereas corn hectarage rose by 5.1 percent between 1987 to 1988 (Appendix 8).

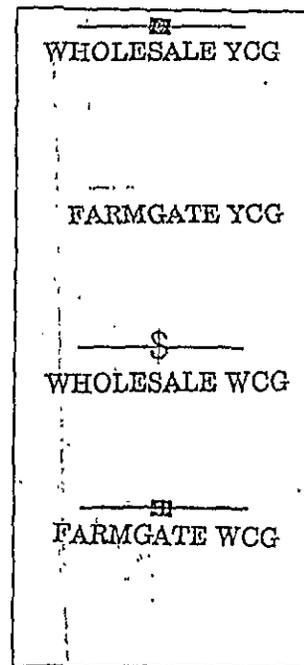
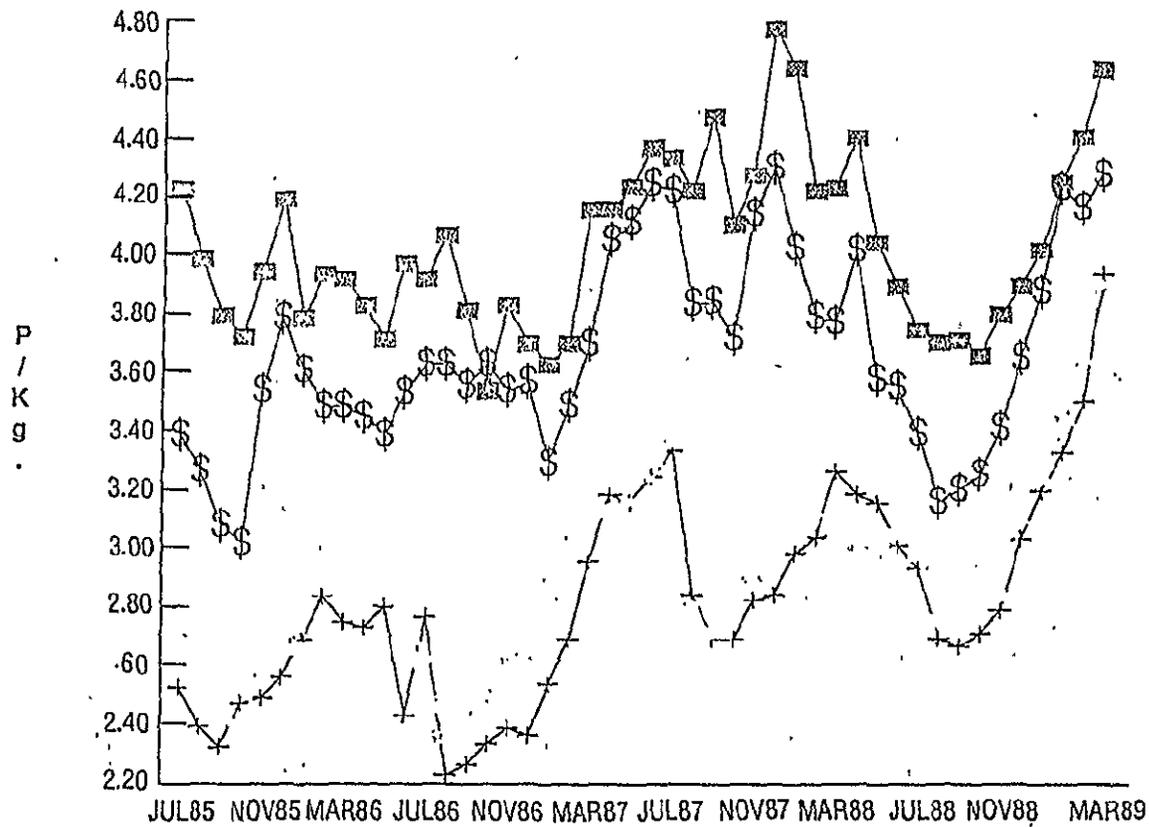
The relatively low production performance of corn in 1989 as compared in 1988 was due to the reported drop in both total production by 6.9 percent and harvested area by 10.3 percent during the July to September, 1989 main harvest output from their 1988 reference levels. ^{1/} The National

^{1/}

October, 1989 report of the Inter-Agency Technical Working Group on Cereals, Food and Feedgrains Assessment of Rice and Corn Situation under the National Agriculture and Fisheries Council.

Figure 2.3

WHOLESALE & FARMGATE PRICES OF CORN
July, 1985 - April, 1989

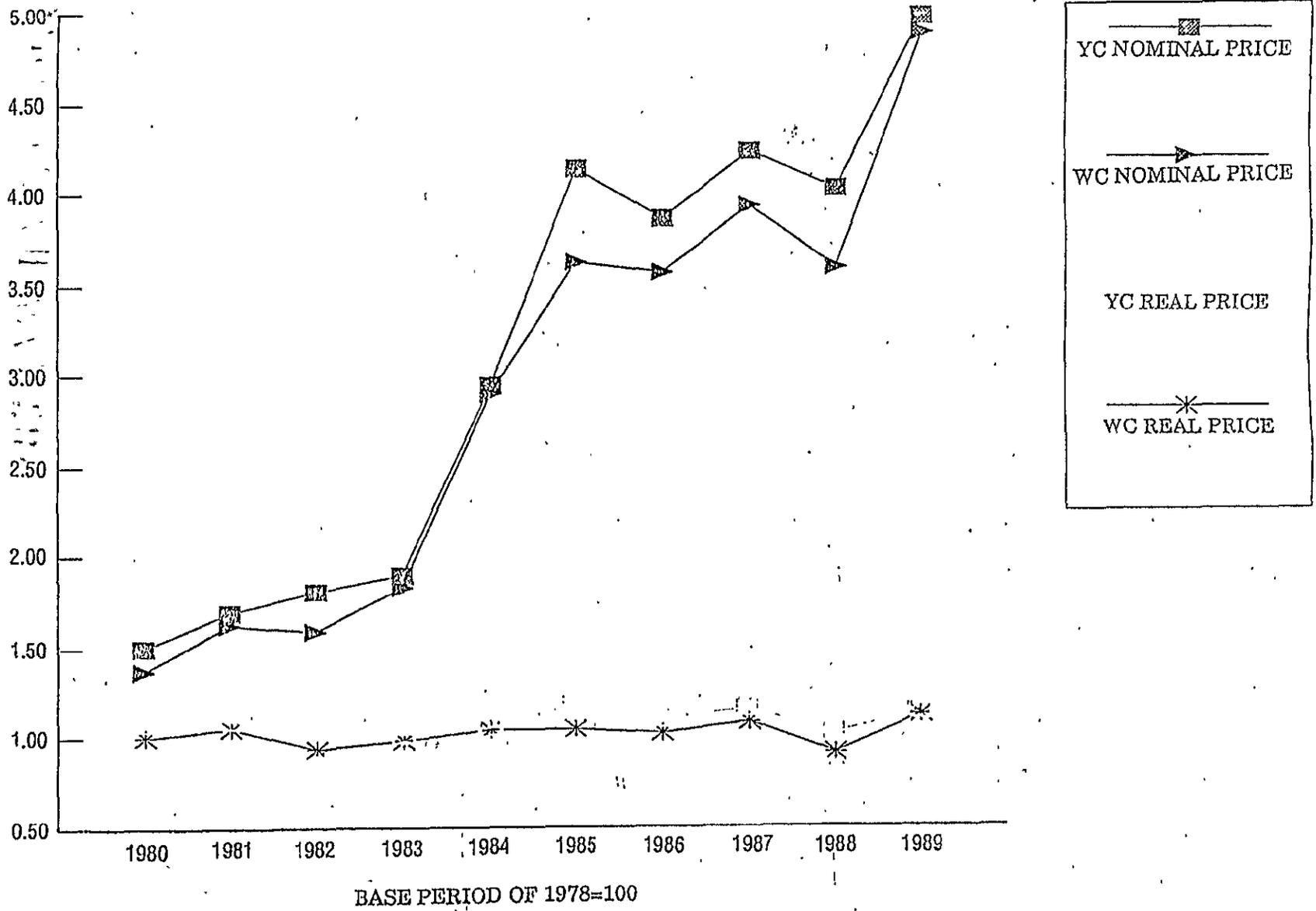


Source: National Food Authority

Figure 2.4

ANNUAL NAT'L TRENDS IN NOMINAL & REAL
WHOLESALE PRICE OF YELLOW & WHITE CORN

P / K g
49



Source: National Food Authority

Agriculture and Fisheries Council (NAFC) reported that the sharp decline in national corn hectarage was due to the conversion of many corn lands in various regions to more lucrative higher-value crops like sugarcane.^{2/}

5. Rising Demand for Feeds

According to a NAFC 1989 report, the demand for feeds will continue to grow at the rate of 7.5 percent as the hog and poultry industry continue to expand at the rate of 6 percent and 10 percent, respectively. The report noted that the rapidly expanding livestock sector will continue to exert acute demand pressure on the corn industry.



The livestock industry, a major end-user of corn, adds value to the commodity.

6. Unusuality in the 1989 Price Behavior

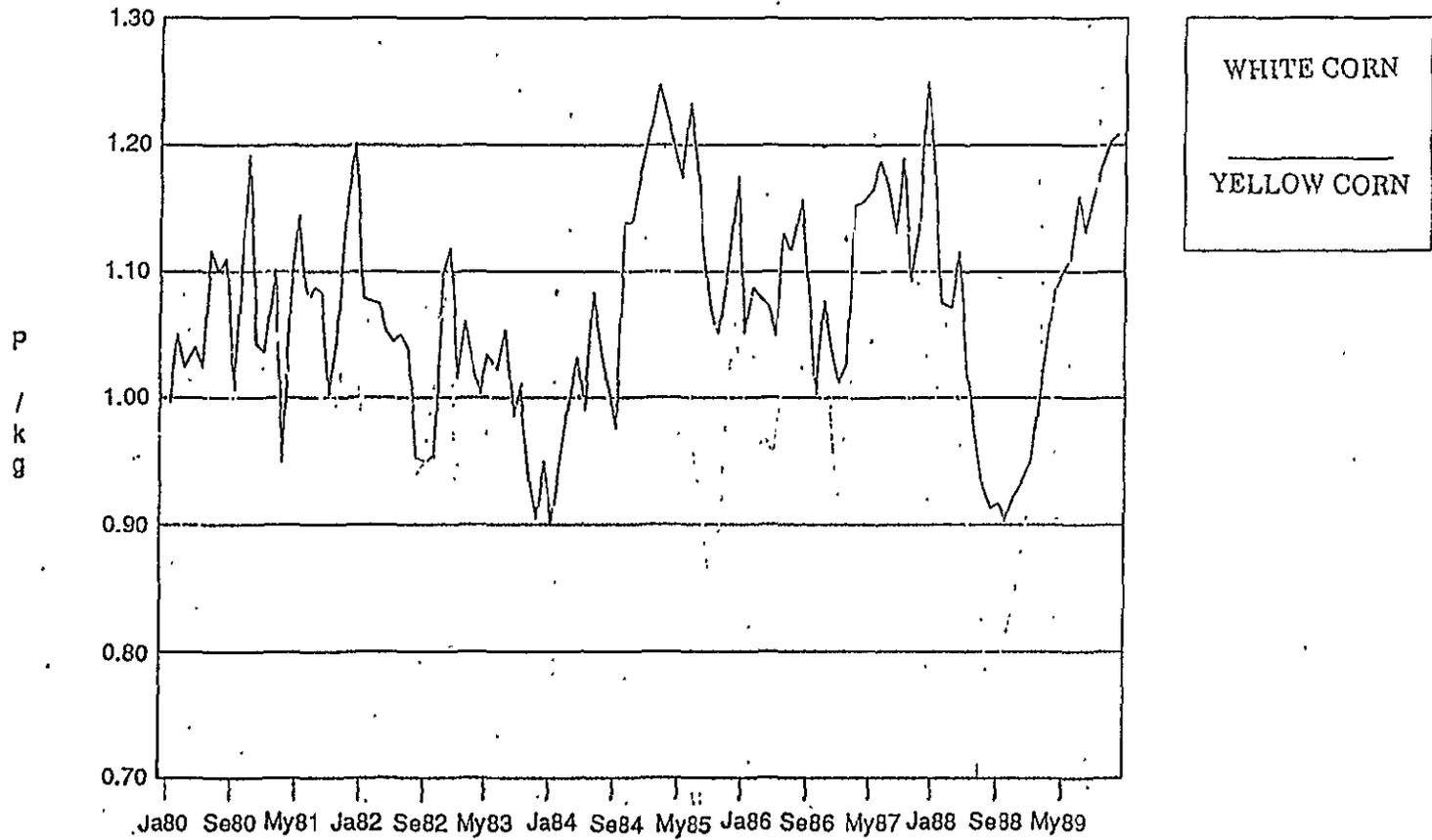
With the sharp decline in national corn output during the 1989 July to September peak harvest period coupled with the surge in demand for feeds by the livestock industry, national wholesale prices of corn did not drop during the peak harvest months from July to September but instead continued to rise until December of that year (Figure 2.5). The 1989 first cropping harvest period was therefore, characterized as a time of dramatic shortage of domestic corn supply.

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^{2/} Based from a newspaper article entitled "Corn Lands Converted to High-Value Crops", *Business Bulletin*, August 23, 1989, p. 25.

Figure 2.5

NATIONAL REAL WHOLESALE PRICES OF CORN
(1980 -1989)



BASE PERIOD OF 1978 =100

7. Sharp Increase in Imports

Due to the reported 6.9 percent decline in production in the July to September 1989 harvests, corn imports sharply increased seven-fold from 25,000 metric tons in 1988 to approximately 176,000 MT in 1989, based on data from the National Food Authority (Figure 2.6). The 1989 NFA allocation for imports included the request for 20,000 metric tons of white corn by corn millers and a large starch manufacturer (Appendix 9).

8. Inter-Island Transportation System

In view of the geographic dispersion between the major corn demand center Manila (Luzon) and the main corn supply points in Mindanao, the shipping industry plays an important role in the distribution system of corn. In 1988, the government had set up a Presidential Task Force to rationalize and create investment incentives for the shipping industry in order to facilitate the inter-island movement of major agricultural commodities, such as corn.

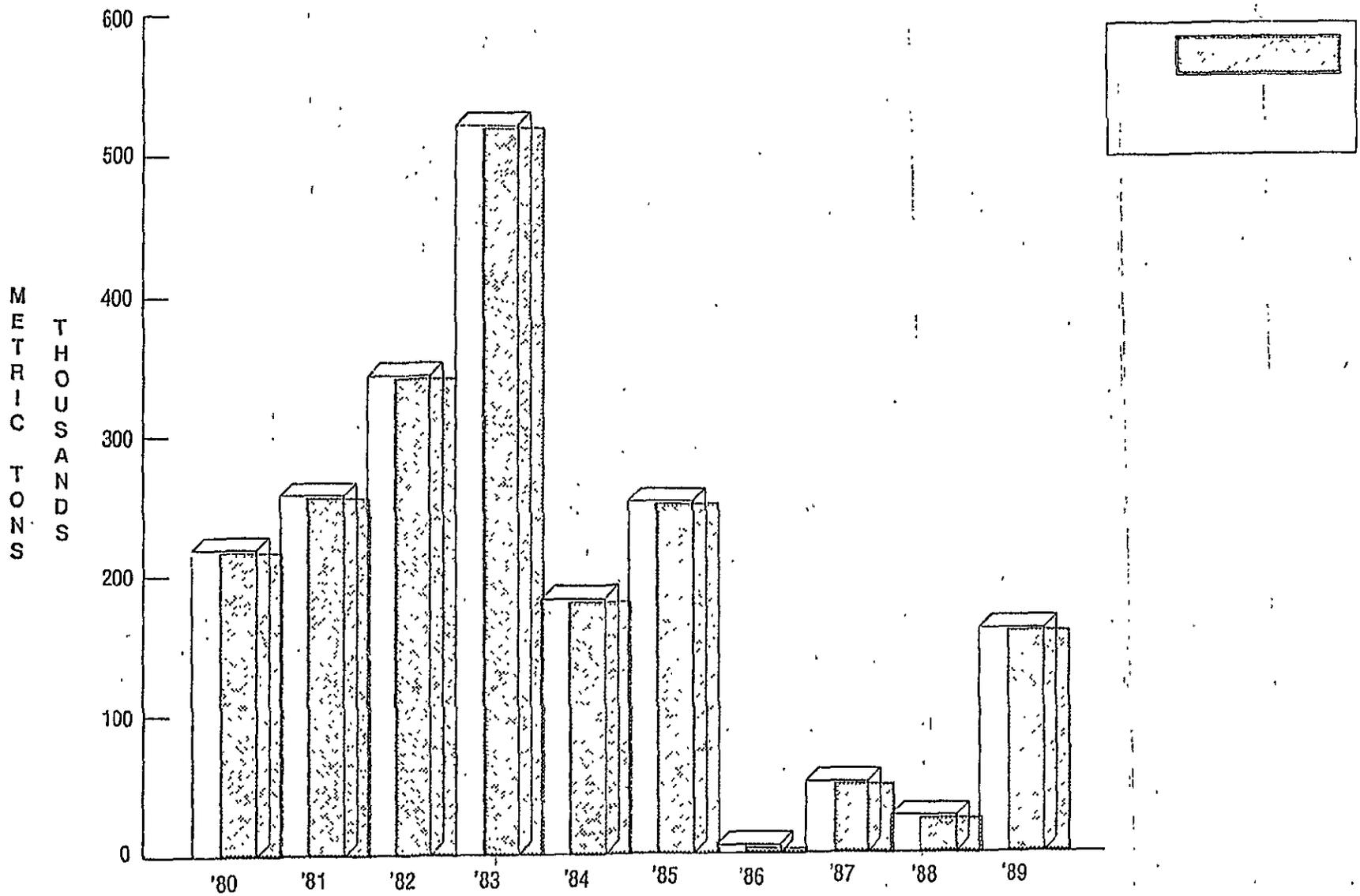
9. Government Intervention

Considering the economic and political importance of corn, government has historically intervened in the corn trade through a floor price support scheme. The policy issue has usually been "At what level would support price be favorable to all concerned groups in the commodity system and how could government effectively and efficiently implement this 'subsidy' scheme?"

Based on the 1987 study by the International Food Policy Research Institute (IFPRI) for the Asian Development Bank (ADB),^{2/} the country has a comparative advantage in producing corn as compared to importing corn, but has no comparative advantage in exporting corn. The study recommends the following policy for growth of the corn sector: "Stabilize corn prices moderately above currently depressed world prices in the short term, sharply increase investments in productivity-enhancing projects and programs, and then reduce domestic prices on a phased basis as productivity increases." The report concluded that government intervention in corn will be necessary through price and technology development policies.

^{2/} "Price and Investment Policies for Food Crop Sector Growth in the Philippines" by M.W. Rosegrant, L.A. Gonzales, H.E. Bouis and J.F. Sison, International Food Policy Research Institute, Washington, D. C. , January 20, 1987.

Figure 2.6 VOLUME OF NFA CORN IMPORTS
(1980 - 1989)



Source: National Food Authority

Chapter III

CROP AND COMMODITY CHARACTERISTICS AT RESEARCH SITES

The municipalities chosen as supply areas were Malaybalay, Don Carlos and Kalilangan in the main corn producing province of Bukidnon; Claveria, a large and highly diversified area in Misamis Oriental Province; and Wao, a farm settlement area in Lanao del Sur Province. One interior and one roadside barangay were selected from each municipality.

Corn crops in Northern Mindanao are rainfed crops with a distinct cropping calendar defined by rainfall patterns. The peak harvests for the first cropping occur during the heaviest rainfall months of July, August and September, making drying of harvested corn difficult. Also, peak harvests of the first cropping season overlapped the planting in the second cropping. Hence, farmers competed for use of the few available tractors for both hauling of harvested corn and for plowing land in preparation for planting. Yields for yellow hybrid corn were higher than white open pollinated varieties. Likewise, yields in farms located in roadside barangays were greater than those within interior farms. Substantial shifts of corn lands to sugarcane production were found in Malaybalay, Valencia and Don Carlos within Bukidnon Province. A preference for particular brands of yellow hybrid seeds were found in specific sample locations.

The Northern Mindanao region had a substantial demand for corn for food and feed uses. Local custom and commercial millers processed white corn grains into grits for staple food. Yellow corn was mostly used as a major ingredient by the feedmillers and hog and poultry raisers. The by-products of milling white corn were also used as feeds.

Cebu City is primarily the major demand area for white corn and secondarily for yellow corn. White corn is mainly used by the corn milling and starch manufacturing sectors. Demand for yellow corn mainly came from the large commercial feedmillers and the expanding hog and poultry raisers.

Manila accounts for the largest demand area for yellow corn due to the presence of many large scale Integrators and commercial livestock raisers in the surrounding regions: It is also the site of many manufacturers of starch, snack foods and other high value products of corn.

This chapter describes the specific research setting within which corn is analyzed as a crop and commodity. It specifies the agro-climatic features of the research sites affecting the technical characteristics of the crop at the farm level. The various forms and uses of corn as a commodity within the different demand areas are likewise described in this chapter.

A. Supply Areas

1. Northern Mindanao

The Northern Mindanao region is composed of seven provinces, has a total land area of 2.83 million hectares, and a total population of about 3.59 million or approximately 598,881 households (1989). The average annual growth rate of the region during the period 1985 to 1989 stood at 2.54%; slightly higher than the country's growth rate of 2.3%^{1/} The projected population, densities, growth rates, and migration trends for the Region X provinces are shown in Appendix 10a- 10d.

1.1. Resources Northern Mindanao's regional development plan to become a major industrial center for the southern Philippines already shows promising signs of being achieved. The regional capital, Cagayan de Oro is reportedly experiencing an economic boom with the swift expansion of its agricultural and mineral-based industries.^{2/} Cagayan de Oro's growth rate for investments in 1988 out performed Manila, Cebu and Davao, according to Board of Investments figures. Its strategic location, modern port facilities, cheaper electricity source, the relatively better peace and order condition than the other major cities in Mindanao combined with a progressive business sector are main attractions for foreign and Manila-based investors.

Agriculture, however, is still the biggest employer in the region. In 1988, approximately 60 percent of the region's 1.35 million employed members belonged to the farming sector.^{3/} Out of the region's total arable area of 1.2 million hectares, only about 60 percent has been actually tapped for agricultural use. Approximately 480,000 hectares of agricultural lands remain to be developed for a variety of grain crops, plantation crops and high value crops.

1.2. Corn Production Trends Corn is the region's main grain crop. The total corn area in 1989 covered 313,520 hectares. Bukidnon is the main corn producing province, with a 64 percent share of the region's total corn area in 1989 (Appendix 11).

White corn is more widely planted than yellow corn in the region. From January to September, 1989, white corn comprised 73.71 percent of the total corn area. In terms of volume, white corn's share was 55.3 percent to the total production. This indicates a much lower yield for white corn at 1.33 metric tons per hectare as compared to yellow corn's 3.0 metric tons per hectare.^{4/}

2. Characteristics of the Sample Supply Areas

2.1. Criteria for Selection The study team considered the following criteria for selecting the sample provinces and municipalities as supply areas for research: a) area planted and volume of corn production are among the highest for the region; b) geographic flow of the corn remains in the region by following the marketing channels toward Cagayan de Oro City; c) most of the production is on a commercial scale; d) corn is planted as a monocrop rather than an intercrop; e) topography provides a comparison

^{1/} Source: National Statistics Office (NSO), Region X.

^{2/} Based from an article in Asiaweek, "Back to the Boom Times", November 17, 1989.

^{3/} Source: Northern Mindanao Regional Development Framework, National Economic and Development Authority, Region X.

^{4/} Source: Department of Agriculture, Region X.

Figure 3.1 Corn Production Areas of RMA Sites
in REgion X, December, 1989

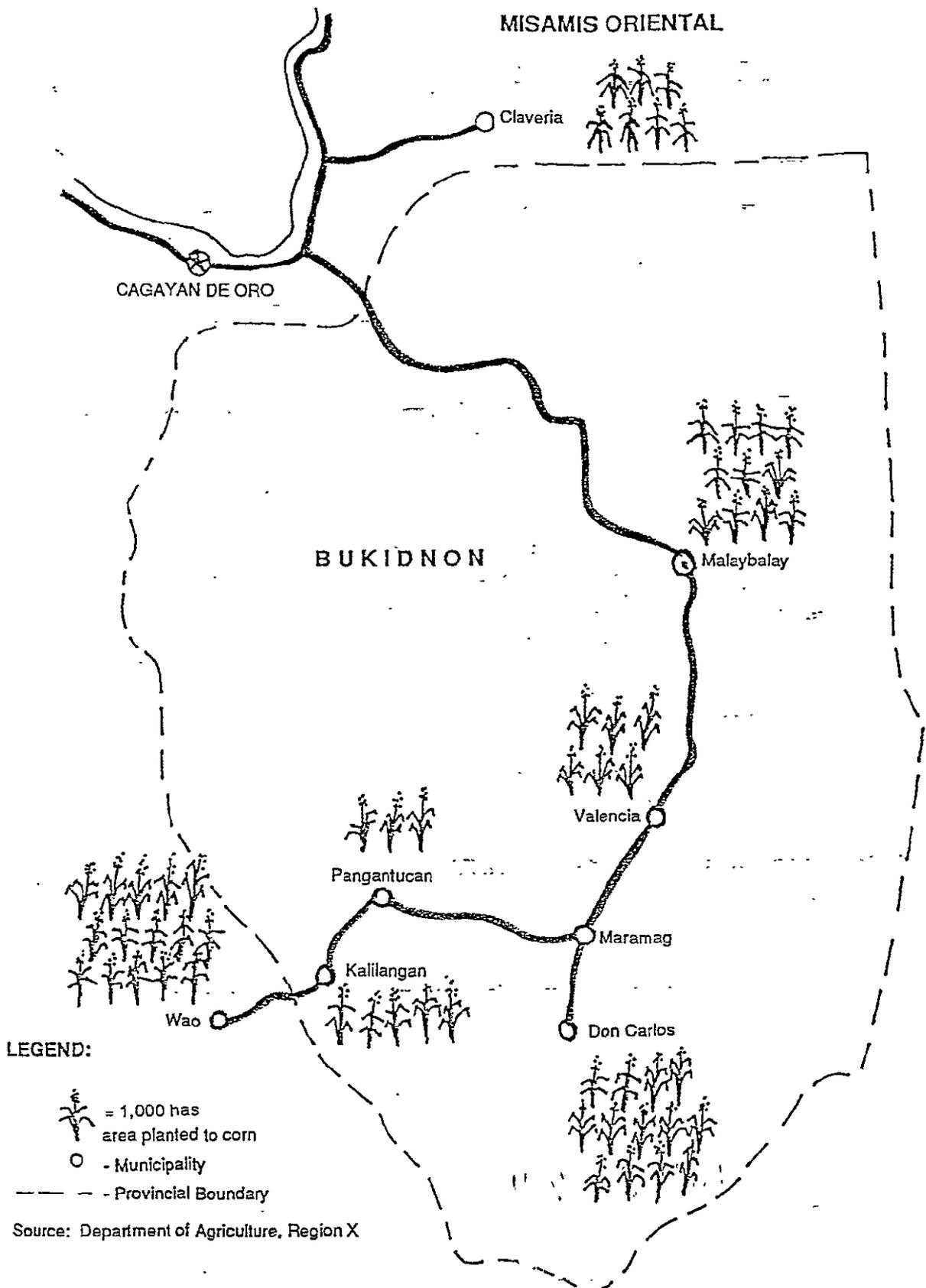
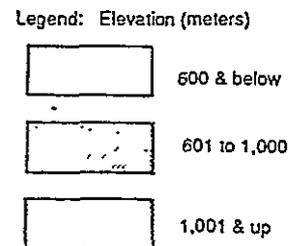
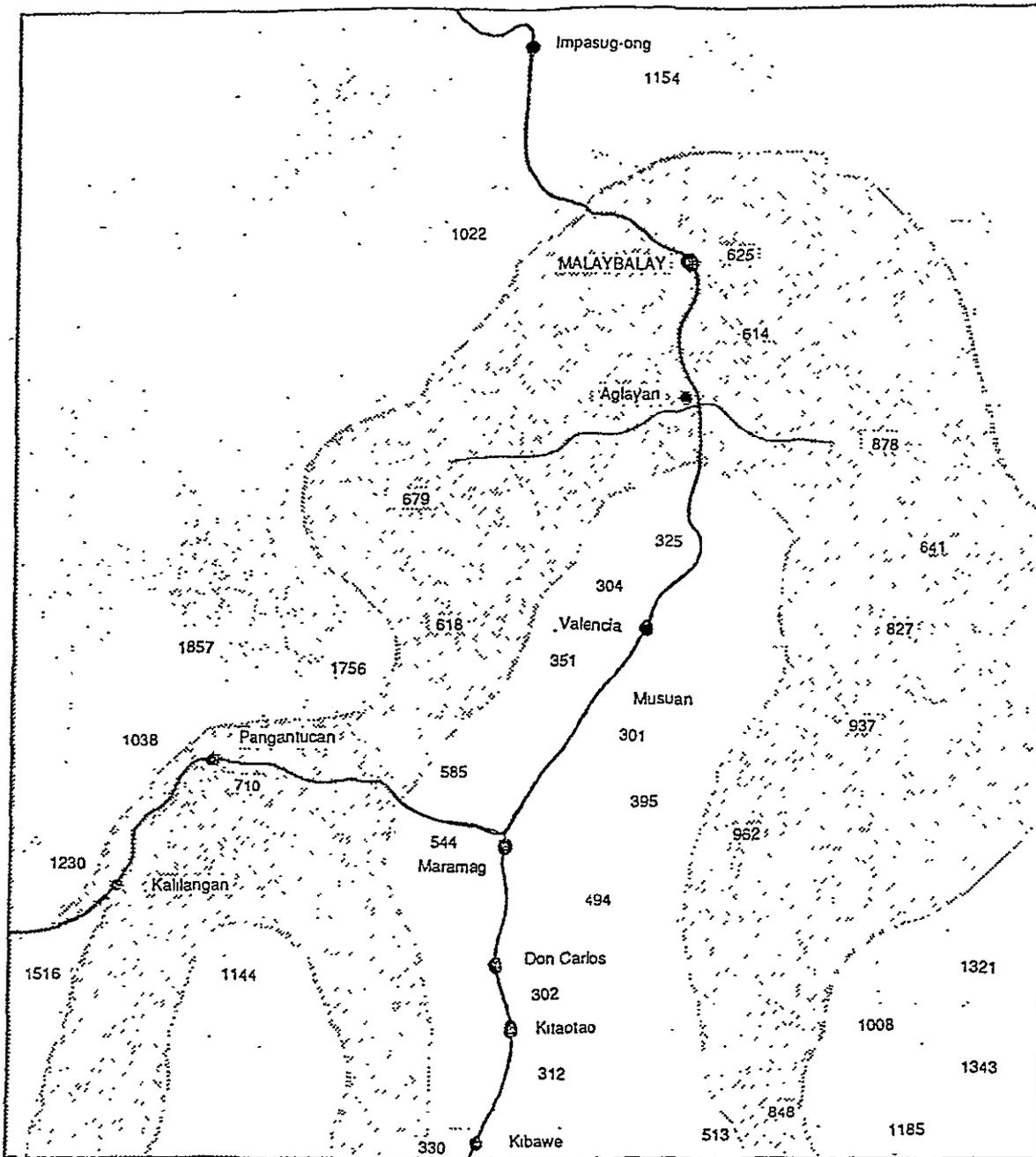


Figure 3.2 Topographical Map of Key Corn Production Areas in Bukidnon Province According to Elevation.



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Table 3.1 Profiles of Target Municipalities In Northern Mindanao and Wao, Lanao del Sur

CHARACTERISTICS	M U N I C I P A L I T I E S				
	CLAVERIA MISAMIS ORIENTAL	MALAYBALAY 1/ B U K I D N O N	DON CARLOS B U K I D N O N	KALILANGAN	WAO- LANAO DEL SUR
LAND AREA (Haa.)	112,174.89	108,259.00	20,599.00	28,102.00	22,905.00
- Agricultural	59,534.09	55,464.00	13,518.00	22,439.45	15,607.00
- Non-agricultural	52,340.8	51,795.00	6,781.00	5,662.55	7,298.00
TERRAIN	Eroded hills, mountains, escarpments & narrow plateaus	Rolling hills, low plains & deep valleys	Flat, rolling & mountainous	Rolling, gently sloping & denuded mountains	Flat highland plateaus, slightly sloping lowlands & steep rolling hills
AVERAGE ELEVATION (ft. above sea level)	1,723	1,750	990	1,230	1,516
ROAD					
- Network (km)	213,001	231.6	158,049	125.3	
- km/sq.km.	0.19	0.21	0.77	0.44	
CONDITIONS OF MAIN ACCESS ROAD	Asphalted, gravelled	Concrete	Gravelled	Gravelled, earth	Gravelled, earth
ACCESSIBILITY					
- km. to prov'l capital	45		68	92	107
- km. to port (Cagayan de Oro 2)	45	93	153	182	200
CLIMATE					
- Driest (mos.)		February	February-March	January-December	January-December
- Wettest (mos.)	November-January	May-October	May-October	May-October	March, May-Sept., November
TIME OF					
- Planting	April-May	February-April	March-April	March-May	February-April
- Harvesting	October-December July-September February-March	August-October June-August November-January	August-September June-July November-December	August-September June-August November-December	August-October June-August November-January
TENURE PATTERN					
- CLTA mortgaging owner			9%	53%	6%
- Tenant			50%		12%
- Owner			41%	47%	82%
TYPE OF SOIL	Clay-loam, Clay	Clay-loam, Loam	Clay, Loam	Clay-loam, Loam	Clay, Clay-loam
MAJOR CROPS	corn, palsey, tomato	corn, palsey, coffee	sugarcane, corn, coconut	corn, palsey	corn, palsey
OTHER CROPS	coffee, cassava, vegetables, cabbage	vegetables, root crops, sugarcane, rubber, abaca	coffee, palsey, rubber, banana	coffee, cacao	coffee, cacao, coconut
POPULATION					
- Rural	19,181.0	63,115.00	29,059.0	13,924.0	24,733.0
- Urban	5,665.0	16,220.00	7,950.0	6,521.0	8,245.0
- Total	24,847.0	82,035.00	37,009.0	20,445.0	32,978.0
- Density (sq. km.)	22.0	83.4	235.0	135.7	143.9
GENERAL PEACE AND ORDER SITUATION	Relatively Stable	Relatively Stable	Relatively Stable	Relatively Stable	Relatively Critical

1/ Malaybalay is the capital of the province of Bukidnon.

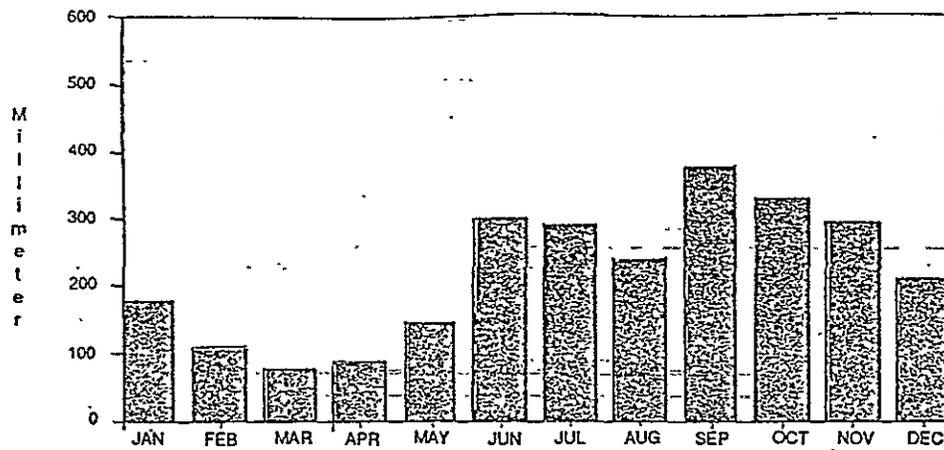
2/ Cagayan de Oro is the capital of the province of Misamis Oriental and trading center of the region.

Source: * Municipal Profile of Claveria, Misamis Oriental
 * Socio-Economic Profile of Malaybalay, Bukidnon
 * Socio-Economic Profile of Don Carlos, Bukidnon
 * Municipal Profile of Kallangan, Bukidnon
 * Municipal Profile of Wao, Lanao del Sur
 * Bukidnon Statistical Yearbook, 1989

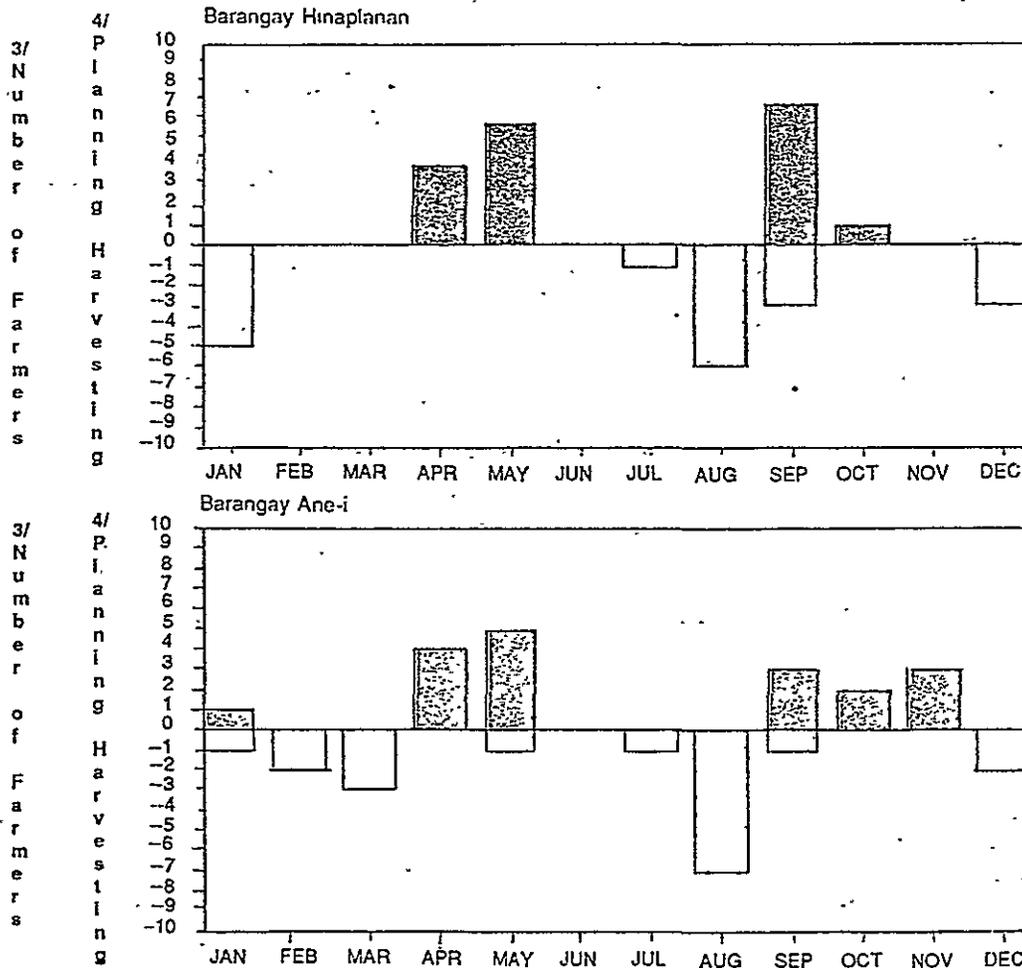
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Figure 3.3a

RAINFALL PATTERN OF CLAVERIA, MISAMIS-ORIENTAL, 1985-1988



CROPPING PATTERN OF SAMPLE FARMERS IN HINAPLANAN & ANE-I, CLAVERIA
(Second cropping of 1988 and First cropping of 1989)

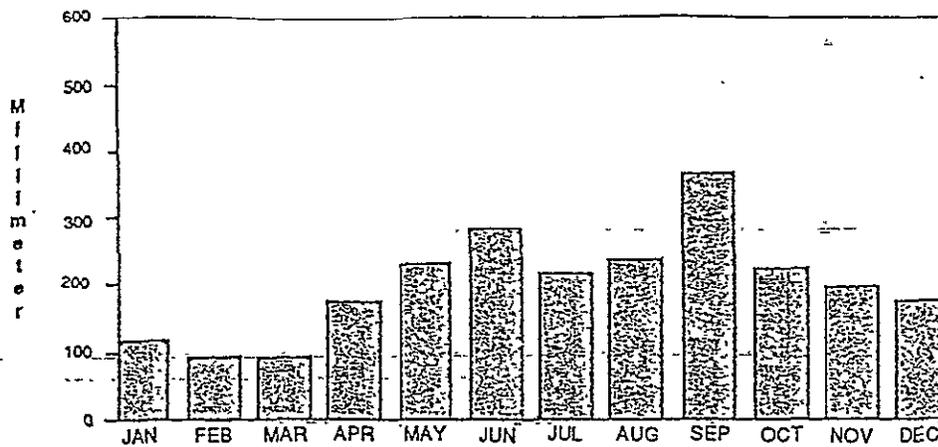


- 1/ Source of rainfall data, IRRI, Claveria
- 2/ Source of cropping pattern data were farmer interviews
- 3/ Ten farmer respondents were interviewed in each sampled barangays.
- 4/ Two yellow and white corn growers in these barangays did not plant during the second cropping of 1988

Figure 3.3b

1/

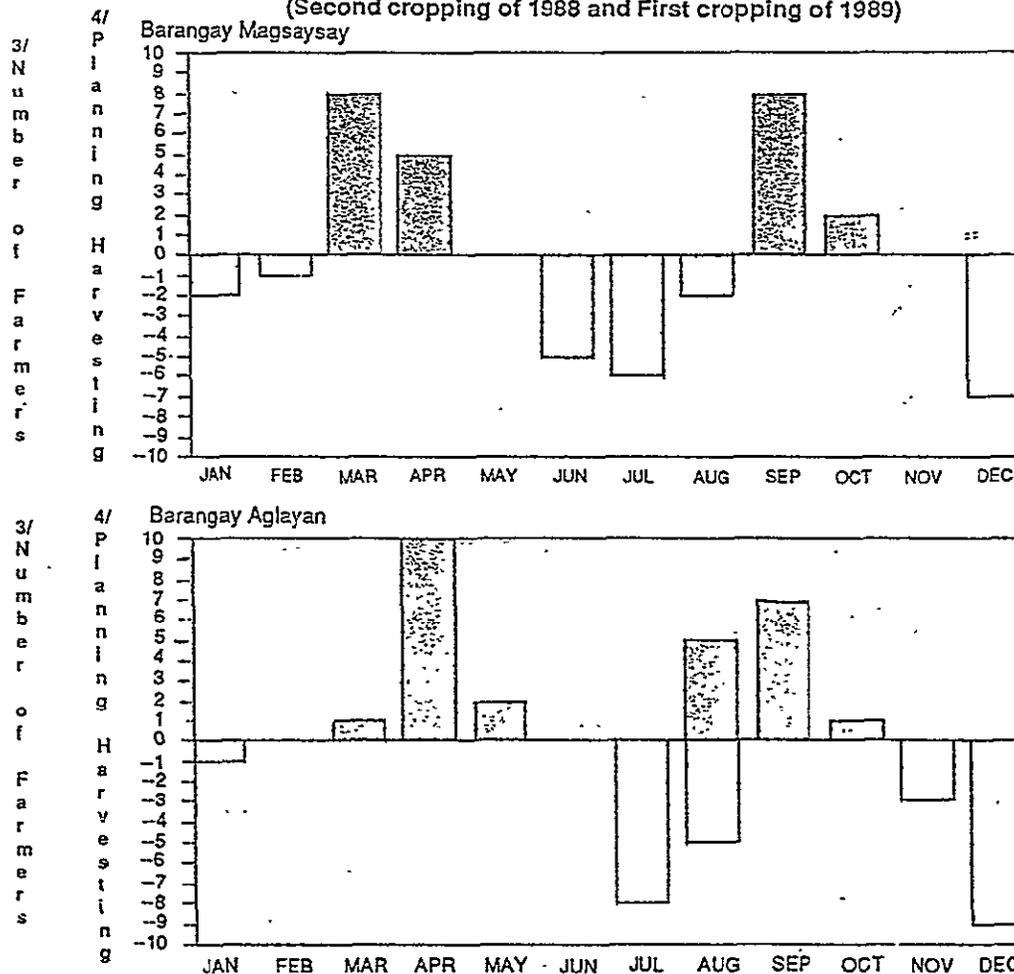
RAINFALL PATTERN OF MALAYBALAY, BUKIDNON, 1985-1988



2/

CROPPING PATTERN OF SAMPLE FARMERS IN KIBANING & LAMPANUSAN, KALILANGAN

(Second cropping of 1988 and First cropping of 1989)

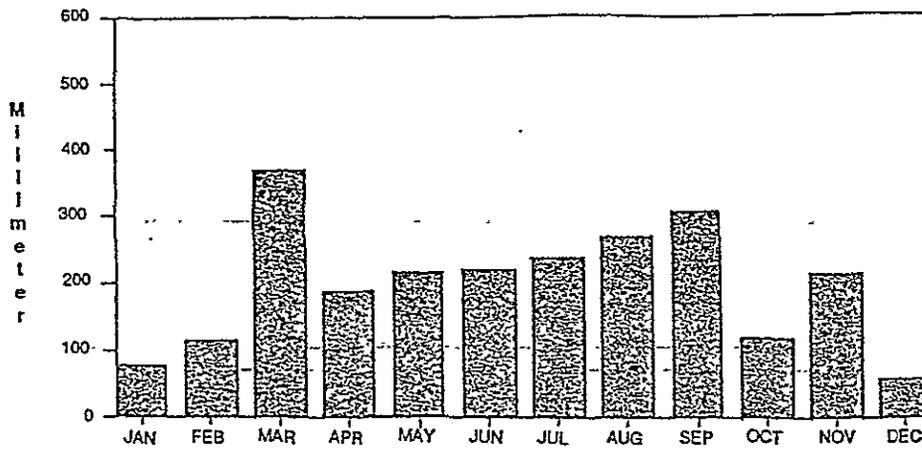


- 1/ Source of rainfall data, PAG-ASA, Malaybalay
- 2/ Source of cropping pattern data were farmer interviews.
- 3/ Thirteen respondents in Magsaysay and fourteen in Aglayan were interviewed.
- 4/ Three white and one yellow corn growers in Magsaysay and Aglayan, respectively, did not plant during the second cropping of 1988

Figure 3.3c

1/

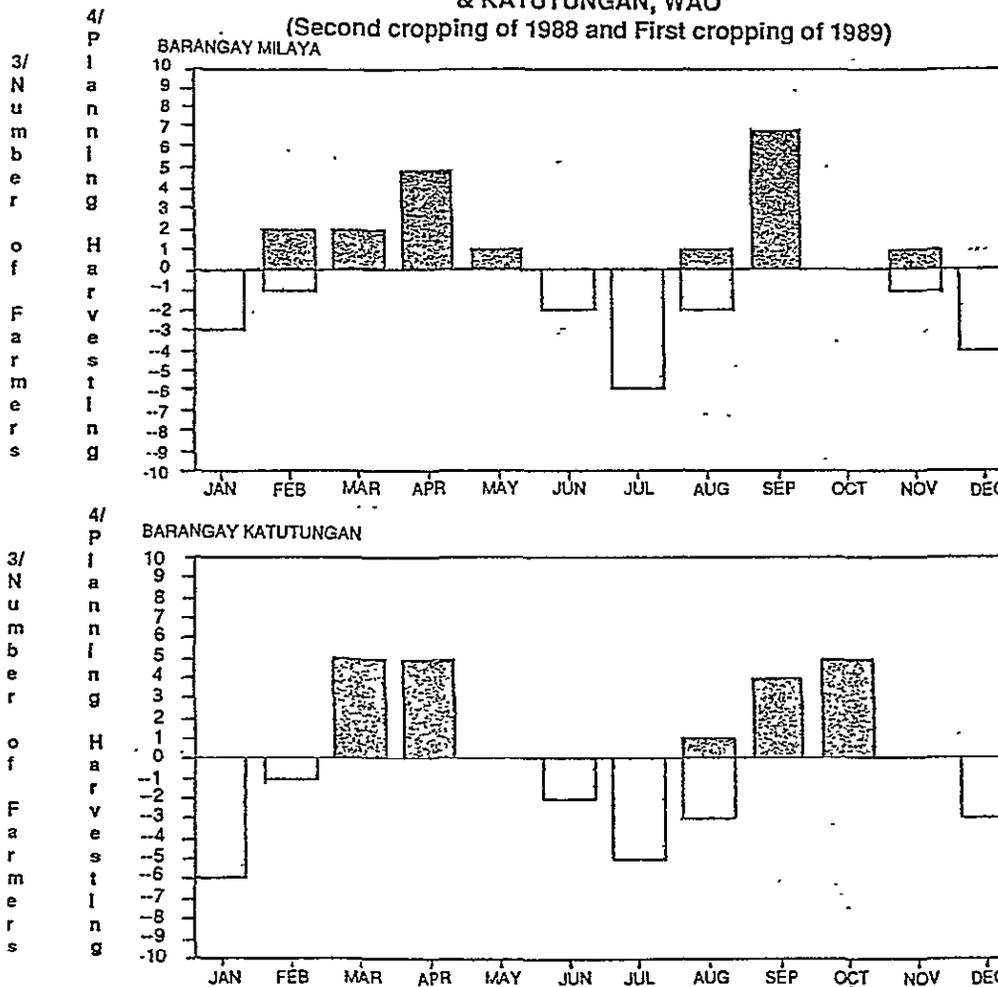
RAINFALL PATTERN OF WAO, LANA O DEL SUR, 1988-1988



2/

CROPPING PATTERN OF SAMPLED FARMERS IN MILAYA & KATUTUNGAN, WAO

(Second cropping of 1988 and First cropping of 1989)



1/ Source of rainfall data, Department of Agriculture, Wao, Lanao del Sur.

2/ Source of cropping pattern data were farmer interviews.

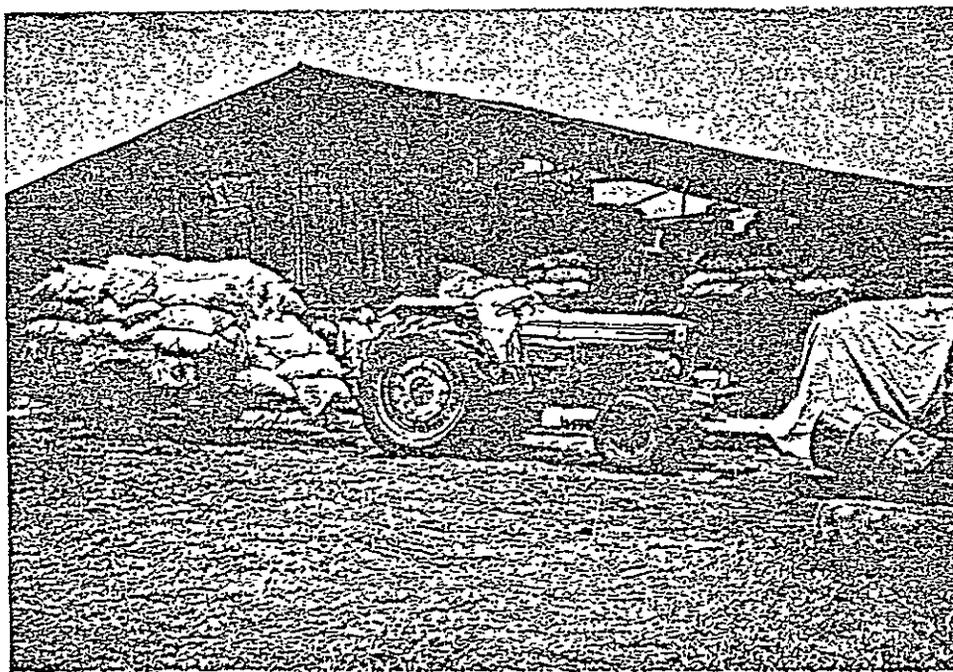
3/ Ten respondents in each barangay were interviewed.

4/ One white corn grower in Milaya did not plant during the second cropping of 1988

Since corn normally matures at about 100 to 110 days, the peak harvest period for the first crop usually occurs in July, August and September. However, the cooler climate in the higher elevations of Claveria, Malaybalay, Kalilangan and Wao causes longer crop maturity resulting to "delayed" harvests of two to three weeks.

The heaviest rainfall usually occurs in July, August and September which coincides with the peak harvests for the first cropping. This rainfall pattern causes problems with drying harvested corn.

The July-August harvesting and August-September planting for the second cropping result in very little time for land preparation during the second planting (Figure 3.3a - 3.3c and Appendices 12 and 13). Harvesting, shelling, drying and transporting corn overlapped with land preparation and planting for the next crop. Consequently, labor and draft power/tractor availability were stretched thin and area planted for second cropping decreased. Moreover, the difficulty of transporting



Demand for tractors increases when the first cropping season's harvest overlaps with the second cropping season's planting.

corn was aggravated by the poor condition of farm-to-market roads during heavy rainfall which likewise delayed the tractors from entering the muddy fields. As such, during the second cropping season, farmers with large farms often opted to reduce their area planted to hybrid corn and/or shifted to more drought tolerant white corn despite their adequate capital for purchasing inputs for yellow corn. They feared incurring heavy losses due to the delayed planting of yellow hybrid corn.

2.6. Soil Condition Soils in corn growing municipalities of Bukidnon and Claveria were generally acidic with farmers cultivating corn in 4.5 to 5.5 pH soils. Corn crops usually thrive in soils with over 5.5 pH.

2.7. Corn Area Converted to Sugarcane National statistics in August, 1989 reported a total of 14.1 percent drop in national corn hectarage due to the shift to other higher value-crops, primarily sugar.^{5/} In Bukidnon, three of the sample municipalities, namely Malaybalay, Valencia and Don Carlos, showed a substantial shift of corn lands to sugarcane production. However, no accurate data were available on the extent of area conversion from corn lands to sugarcane for the region. The implications of the shift of corn farmers to sugarcane production are discussed more lengthily in Attachment B.

3. Barangays

3.1. Criteria for Selection Using the "compare and contrast" approach for analyzing research sites, two barangays were selected per municipality with one interior (less accessible from the main road) and the other a roadside (very accessible or along the main road) barangay. Another factor, topography, was linked with the variety or type of corn grown, i.e., whether yellow hybrid or white open pollinated type. The comparison of topographies was intended to reflect the performance of yellow hybrid vs. white open pollinated variety under level, sloping or hilly growing conditions.

The ten sample barangays within the provinces/municipalities selected, classified by interior or roadside location are as follows:

Province	Municipality	Barangays	
		Interior	Roadside
Misamis Oriental	Claveria	Hinaplanan	Ane-i
Bukidnon	Malaybalay	Magsaysay	Aglayan
	Don Carlos	New Visayas	Pualas
	Kalilangan	Kibaning	Lampanusan
Lanao del Sur	Wao	Milaya	Katutungan

These locations are given in Figure 1.2a.

^{5/} Based from a newspaper article "Corn Lands Converted to High-Value Crops", Business Bulletin, August 23, 1989. The article cited the findings of the Technical Working Group on Cereals under the National Agricultural and Fishery Council (NAFC).

3.2. Barangay Profiles The ten sample barangays are briefly described in the Barangay Profiles (Table 3.2a - 3.2c). These profiles depict the "static" perspective of the barangay such as size, access, tenure pattern and topography as against the "dynamic" perspective or indicators that reinforce, reflect and inhibit growth, such as presence of community-based associations and types of houses and public utilities.

Barangays sampled varied widely in size from 75 to 650 households and from about 600 has to about 3,500 has. Ninety percent were accessed by gravel or dirt roads. In terms of productive enterprises, all barangays sampled except for Hinaplanan in Claveria had corn as the major productive enterprise. Livestock, such as cattle, cow and carabao were found in all barangays. Majority of the houses were of semi-permanent structure, i.e., a combination of concrete, wood and indigenous materials, reflecting the less affluent condition of most sample barangays. Only the more progressive barangay of Aglayan showed more permanent types of houses.

4. Farmers/Crops

4.1. Criteria for Selection The main criteria for selecting the sample farmers at the barangay level was the type of variety harvested during the first cropping season, i.e., whether it was the yellow hybrid or the white open pollinated variety (OPV), popularly known as "tiniguib". For each of the barangays in Malaybalay (Aglayan and Magsaysay) and Don Carlos (Pualas and New Visayas), the team searched for seven farmers growing yellow hybrids and seven white OPV farmers. Of the seven farmers for each type, two were interviewed in-depth regarding details on their production costs and returns. Due to time constraints and the relatively unfavorable peace and order condition in the barangays of Claveria (Hinaplanan and Ane-i), Kalilangan (Kibaning and Lampanusan), and Wao (Milaya and Katutungan), the sampling size for yellow and white corn farmers in the barangays was reduced to five each.

4.2. Distribution of Yellow vs. White Corn Farmers Although an equal number of hybrid vs. white OPV farmers for each barangays was sought, actual distribution by type of farmer sampled was not always exactly equal within each barangay. Yellow hybrid corn farmers were very difficult to find in some interior barangays such as Magsaysay (Malaybalay), New Visayas (Don Carlos) and Kibaning (Kalilangan) even though the D.A. informants thought several could be found. In contrast, in the progressive roadside barangay of Aglayan (Malaybalay) it was very difficult to find white OPV farmers. As a result, of the total 115 farmers interviewed, 53 were hybrid yellow corn growers while 62 grew white OPV varieties. Additional white corn farmers were sampled in those three interior barangays to compensate for the lack of sample yellow corn farmers in those areas.

4.3. Conditioning Environment Rainfall was the only source of water for corn production for all farmers interviewed. The dominant soil type planted to corn was clay loam (56 percent) which is considered suitable for production of both yellow and white corn varieties. However, soils were generally acidic such that farmers incurred additional costs for liming. Most fields had fairly good drainage which allowed land preparation within 2 days after several hours of rain, by using mostly animal drawn plow. Topography ranged from mostly flat to rolling fields rather than hilly (Appendix 14).

Table 3.2a Barangay Profile of Sample Barangays in Claveria, Misamis Oriental

PERSPECTIVE	HINAPLANAN	ANE-I
STATIC :		
SIZE		
Housholds (#)	155	
Ave. Landholding (ha)	2	
Total Land Area (ha)	3,303	1,350
Arable land Area (ha)	1,000	1,350
ACCESS		
Distance to town (km)	9.5	2.5
Distance to paved road (km)	9.5	2.5
Road condition	Gravel road/good	Gravel road/good
SOURCE OF WATER		
Rainfed	90%	100%
Irrigated	10%	
TENURE PATTERN		
Owner-cultivator	25%	30%
Amortizing owner	10%	
Tenants	40%	45%
Land owners	25%	25%
TOPOGRAPHY		
Level	90% Flat to rolling	40%
Sloping	8%	60%
Hilly	2%	
MAJOR PRODUCTIVE ENTERPRISE		
Crop 1st	cassava	corn
2nd	corn/palay	cassava
3rd	tomato/peanut	tomato
Animals	cow, carabao, horse	cow, carabao
COMMERCE		
Traders (#)	5 corn traders	4
Sari-sari Stores (#)	15	25
DYNAMIC :		
REINFORCING GROWTH		
	Samahang Nayon Coop	San Isidro Multi-purpose
	PAG-ASA Assn. for Youth	Cooperative of Ane-i
	Mothers' Class	Elementary School
	Elementary/Barangay	Drying floors
	High School	Electricity
	Electricity	Increase usage of hybrid
	Use of Hybrid seeds	seeds
	Plan to construct pavement	Entry of cassava farming
		Higher price of corn this
		crop season
		Entry of new small sari-
		sari stores
REFLECTING GROWTH		
Houses - Temporary	19%	10 houses were improved
- Semi-permanent	75%	in the past 3-5 years
- Permanent	6%	
Vehicles	Motorcycles, Jeeps	Motorcycles, Jeeps
Appliances	Stereos, TV	Stereos, TV, Betamax
INHIBITING GROWTH		
	Insufficient water system	Long dry spell last 1985
	Lack of capital in buying	Peace and order problem
	high cost of inputs	1985-1986
	High transport cost due to	Vices, such as Masiao -
	poor road condition	Jai-alai (1985)
	Lack of post-harvest	
	facilities	

Sources : Interview with Barangay Officials, September 1989
Barangay Profiles

Table 3.2b Barangay Profile of Sample Barangays in Malaybalay, Don Carlos and Kallangan, Bukidnon

PERSPECTIVE	MALAYBALAY		DON CARLOS	
	MAGSAYSAY	AGLAYAN	NEW VISAYAS	PUALAS
STATIC :				
SIZE				
Households (#)	259	500	75	218
Ave. Landholding (ha)	5			
Total Land Area (ha)	2,450	3,500	600	
Arable land Area (ha)	1,465		276	640
ACCESS				
Distance to town (km)	11	13	25	16
Distance to paved road (km)	4	along national highway	50	41
Road condition	earth	asphalted	earth/gravel	rugged dirt
SOURCE OF WATER				
Rainfed	100%	100%	100%	100%
Irrigated				
TENURE PATTERN				
Owner-cultivator	4%	10%	20%	70%
Amortizing owner/CLT Holder	48%	40%		2%
Tenants	15%	40%	80%	25%
Land owners	3%	10%		
Landless	30%			
TOPOGRAPHY				
Level	50%	25%	10%	25%
Sloping	25%	75%	10%	75%
Hilly	25%		80%	
MAJOR PRODUCTIVE ENTER				
Crop 1st	corn	corn	corn	corn
2nd	coffee	sugarcane	rice	coconut
3rd	sugar	rubber		coffee
Animals	cow (Range 1-2 heads/ household)	cow (Range 2-5 heads/ household)	cow, carabao	cow, carabao
COMMERCE				
Traders (#)	11 (corn and coffee)	14 (corn & 5 of which are also trading palay)	4 (corn and rice)	7 (corn)
Sari-sari Stores (#)	11	25	4	18
DYNAMIC :				
REINFORCING GROWTH				
	Provincial road Entry of H ₂ hybrid corn and Sugarcane Increased number of traders from 6 to 11 Higher corn prices this season Basketball court/ drying floor Electricity Samahang Nayon Agrarian Reform Beneficiaries Assn.	National highway Sugarcane entry Jobs in post harvest processing Hybrid corn farming Basketball court/solar dryers	Samahang Nayon Agrarian Reform Beneficiaries Assn Basketball courts Basketball courts Graveling of roads 1986 hybrid was introduced Higher corn prices this season	Samahang Nayon Basketball courts/ drying floors Electricity (38%) Sugarcane introduction Higher corn prices this season
REFLECTING GROWTH				
Houses - Temporary		10%	20%	11%
- Semi-permanent	19.3%	30%	80%	63%
- Permanent	4.2%	60%		6%
Vehicles	Motorcals Motorcycle	Motorcycle Tractor-trailer Jeeps Trucks 6X6 GI (War surplus trucks)	Motorcycle	Motorcycle Jeeps
INHIBITING GROWTH				
	Poor road condition Political unrest for the past 4-5 years	1987 flood Price fluctuations Gambling (partak)	1984 drought (6-7 mos.) 1983 political unrest decreased population No electricity Trading monopoly High cost of inputs	Flash flood Gambling

Sources: Interview with the Barangay Officials, August 1989
Barangay Profiles

Table 3.2c Barangay Profile of Sample Barangays in Wao, Lanao del Sur

PERSPECTIVE	MILAYA	KATUTUNGAN
STATIC :		
SIZE		
Households (#)	800	160
Ave. Landholding (ha)	6-8	6-8
Total Land Area (ha)	1,932	600
Arable land Area (ha)	1,589	600
ACCESS		
Distance to town (km)	18	7
Distance to paved road (km)	95	84
Road condition	Gravel	Earth/gravel
SOURCE OF WATER		
Rainfed	100%	95%
Irrigated		5%
TENURE PATTERN		
Owner-cultivator	100% (settlement area)	60%
Amortizing owner		
Tenants		40%
TOPOGRAPHY		
Level		90%
Sloping	100%	
Hilly		10%
MAJOR PRODUCTIVE ENTERPRISE		
Crop 1st	corn	corn
2nd	palay	palay
3rd		
Animals	carabao/cow	carabao/cow
COMMERCE		
Traders (#)	4 corn/rice	2 corn trader
Sari-sari Stores (#)	10 (7 buys corn)	
DYNAMIC :		
REINFORCING GROWTH		
	Samahang Nayon	Samahang Nayon Cooperative
	Basketball court	Electricity, School
	Improvement of access roads	Road improvement
	Road construction employment (SRRIP)	Increase of population
	Use of hybrid seeds	Use of hybrid seeds
	Coffee farming	
	BARC, School	
REFLECTING GROWTH		
Houses - Temporary	50%	7%
- Semi-permanent	50%	90%
- Permanent		3%
Vehicles	Motorcycle, Jeep	Motorcycle, Jeep
Appliances	Radio, Stereos	Radio, Stereo, Betamax
INHIBITING GROWTH		
	Gambling	Inadequate drying facilities
	Four (4) months drought, 1966	High cost of transportation
	No electricity	Lack of tractors
	Poor road condition	Far location of sand and gravel source
	Inadequate post harvest facilities	

Sources: Interview with the Barangay Officials, August 1989
Barangay Profiles

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In general, hybrid yellow corn varieties tended to be planted in the "better fields", i.e., more accessible to main road, flat areas, good soil conditions. As will be indicated by our costs/returns data in Chapter VI, hybrid corn required bigger investments but yielded larger profit margins compared to white corn.

4.4 Characteristics and Meaningful Groups of Farmers Ethnic origin and other criteria for forming meaningful groupings of farmers provided useful insights into farmer characteristics.

a. Ethnic Origin Cebuano farmers who preferred to eat white corn grits as their staple food were more frequently encountered in Magsaysay, Aglayan, New Visayas, Pualas, Hinaplanan and Ane-i. White corn was predominantly grown in these areas and custom mills were located nearby. Whereas, in the "traditional" yellow corn areas of Kalilangan and Wao, Ilongo farmers who preferred to eat rice were more dominant and therefore, planted corn primarily for sales purposes. One inference would be that the promotion of white hybrid varieties should focus on locations where Cebuano farmers are present.

b. Yield Ranges by Meaningful Groupings of Farmers Yield ranges were compared for these three groupings of farmers: a) variety grown during the first cropping season, b) farmers' barangay location relative to the main road and c) relative size of the farm. The actual yields for the first cropping season, 1989 were arranged from lowest to highest for each grouping of farmers, then the lowest 25% were termed "Lowest", the next 50% as "Medium", and the remaining 25% as "Highest". This comparison of ranges by meaningful grouping is intended to address the question of distribution versus yield averages and to reinforce previous research or indicate potential topics for further research.

Of the 115 farmers sampled, farmers who planted open-pollinated white varieties (54%) slightly outnumbered those with hybrid yellow corn varieties (46%). Farmers who grew yellow varieties consistently outyielded white varieties at all three yield levels of lowest, medium and highest by 60%, 58%, and 100%, respectively (Table 3.3a).

The distribution of farmers by their barangay's location was 49% and 51% as interior versus roadside. Yield ranges of corn farmers in roadside barangays were somewhat higher than those in interior barangays for lowest, medium and highest levels by 42%, 8%, and 9%, respectively (Table 3.3b).

The relative size of farmers was defined as small (3 has or less) and large (over 3 has) with a distribution of 63% smaller and 32% larger. The yield differences by level were minor and that large farmers had the same or slightly better average yields at the lowest and medium range, i.e., 0% and 4% respectively. Whereas small farmers had better average yields at the highest range (Table 3.3c).

The relative location of the barangay with implications for yields warrants further examination, especially considering availability of agricultural inputs as well as less costly access to market outlets.

Table 3.3a Yield Comparison between Yellow Hybrid and OPV White Corn Farmers,
First Cropping Season, 1989

YIELD RANGE 1/	YELLOW HYBRID CORN FARMERS (N=53)		OPV WHITE CORN FARMERS (N=62)		% YIELD DIFFERENCE RELATIVE TO WHITE CORN FARMERS 2/
	No. (N)	Average Yield MT/Ha.	No. (N)	Average Yield MT/Ha.	
Lowest	13	1.6	16	1.0	60
Medium	27	3.0	30	1.9	58
Highest	13	5.4	16	2.7	100

1/ Criteria for computing "low vs. high" and of the range for "medium" was average of 25% lowest vs. 25% highest and 50% medium actual yields because the distribution was very wide.

$$2/ \text{ \% Yield} = \frac{\text{Ave. yield of yellow corn farmers} - \text{Ave. yield of white corn farmers}}{\text{Difference Ave. yield of white corn farmers}}$$

Source: Farmer Interviews

Table 3.3b Yield comparison Between Farmers by Location of Farms,
First Cropping Season, 1989

YIELD RANGE 1/	ROADSIDE FARMERS (N=59)		INTERIOR FARMERS (N=56)		% YIELD DIFFERENCE RELATIVE TO INTERIOR FARMERS 2/
	No. (N)	Average Yield (MT/Ha)	No. (N)	Average Yield (MT/Ha)	
Lowest	15	1.5	14	1.0	42
Medium	29	2.8	28	2.6	8
Highest	15	4.1	14	3.7	9

1/ Criteria for computing "low vs. high" and of the range for "medium" was average of 25% lowest vs. 25% highest and 50% medium actual yields because the distribution was very wide.

$$2/ \text{ \% Yield Difference} = \frac{\text{Ave. yield of roadside farmers} - \text{Ave. yield of interior farmers}}{\text{Ave. yield of interior farmers}}$$

Source: Farmer Interviews

Table 3.3c Yield Comparison Between Farmers According to Size of Farm
First Cropping Season, 1989

YIELD RANGE 1/	LARGE FARMERS (N=43)		SMALL FARMERS (N=72)		% YIELD DIFFERENCE RELATIVE TO SMALLER FARMERS 2/
	No. (N)	Average Yield (MT/Ha)	No. (N)	Average Yield (MT/Ha)	
Lowest	11	1.2	18	1.2	0
Medium	21	2.3	36	2.2	4
Highest	11	4.4	18	4.7	-6

1/ Criteria for computing "low vs. high" and of the range for "medium" was average of 25% lowest vs. 25% highest and 50% medium actual yields because the distribution was very wide.

2/
$$\% \text{ Yield Difference} = \frac{\text{Ave. yield of larger farmers} - \text{Ave. yield of smaller farmers}}{\text{Ave. yield of smaller farmers}}$$

Source: Farmer Interviews

4.5. Performance of Seed Varieties Under Farmers' Field Conditions A comparison of the technical characteristics of OPV white variety vs. hybrid varieties, including the expected yields is shown in Table 3.4. The comparison showed the potential of hybrids to reach or even slightly exceed seed companies' expected yield given favorable agro-climatic conditions and proper cultural practices. For instance, a 6.8 metric ton yield was registered by a farmer in Aglayan. Other comparisons of white vs. yellow corn cited by the sample farmers were: a) better storage quality of white corn vs. yellow corn and b) adaptability of both varieties to both first and second cropping seasons.

The primary reasons for varietal selection were yield and cost-related factors. According to the sample farmers, "less expensive to cultivate" was their primary reason for selecting open-pollinated white corn varieties. "High-yield" was the main factor cited by those who planted hybrids. However, trader financiers played an important role in varietal selection for their financed farmers. Some traders promoted the yellow hybrid variety which gave the best yield and income to their farmers. Other traders availed of special seed discounts, delayed payment for seed, and other promotional benefits from seed companies when selecting the variety to supply to their financed farmers.

a. Preference for Specific Brands of Hybrid Varieties by Location A preference for specific brands of hybrid seeds existed in specific locations according to our sample. Pioneer yellow hybrid was more popular in the roadside barangays of Ane-i, Aglayan and Katutungan. SMC yellow hybrid was dominant in the interior barangays of Hinaplanan and Milaya as well as on the roadside barangay of Pualas. Cargill yellow hybrid seeds were planted in Kibaning (interior) and Katutungan (roadside). Only in Kibaning were all three brands of hybrid seeds found. Table 3.5 shows the preference for specific brands of hybrid varieties and corresponding yields by location for the 1989 first cropping season.

B. Demand Areas

The research used the "tracing" sampling approach in selecting the demand areas. This involved following the flow of corn starting from the farmers first sale to their buyers, to the next level of buyers, and up through the marketing channels until end-users were located. Although end-users of corn grain were found within the region such as Cagayan de Oro, the major demand areas for corn were Cebu and Manila (Figure 3.4).

1. Northern Mindanao

The Northern Mindanao region had a substantial demand for corn as an end-user itself. However, the major share of its total production has historically been shipped to the major demand areas of Cebu and Manila. Thus, Northern Mindanao has served more as a corn "supply region" where its premier city, Cagayan de Oro, functioned as a distribution or transshipment center.

1.1. Major Uses of Corn The primary uses of corn within the region were for food and feeds. A substantial portion of the rural households ate corn grits for staple food. Livestock and poultry raisers locally consumed feeds with corn as the major ingredient.

Table 3.4 Technical Characteristics of Open-Pollinated Varieties (OPV)
VS. Hybrid Varieties

CHARACTERISTICS	OPV TINIGUIB/IPB	HYBRID
Yield Range (MT/has): 1/		
A. Expected 2/	1.5 - 4.0	4.5 - 6.5
B. Actual		
Averages: lowest	1.0	1.6
medium	1.9	3.0
highest	2.7	5.4
Best case: one farmer 3/	4.0	6.8
Maturity (days)	95 - 110	110 - 120
Seeding rate (kg/ha) 4/	15 - 20	
Hardiness	Tolerant-Limited Tolerance	Limited Tolerance
Susceptibility 5/	Resistant to Semi- resistant (0-1 Appl.)	Limited Tolerance (2-3 Appl.)
Responsiveness 6/	Somewhat Moderately Responsive (0-4 bags)	Very Responsive (4-6 bags)
Storability 7/	Longer	Shorter, Longer Moderate
Seasonal Adaptability 8/	1st-2nd Cropping	1st-2nd Cropping

1/ Based on Hybrid Seed Companies' research.

2/ Based on farmer interviews, August to September 1989. The criteria for computing "low" vs. "high" and of the range for "medium" was the average of 25% lowest vs. 25% highest and 50% medium actual yields because the the distribution was very wide.

3/ Growth period in terms of days from planting to harvesting.

4/ Refers to tolerance to drought and heavy rainfall.

5/ Susceptibility to disease is with respect to resistance based on the number of pesticide applications needed.

6/ Responsiveness refers to the plant's ability to increase yield at high levels of fertilizer application and better soil condition.

7/ Shelf life for storing the seeds.

8/ March to May for the first cropping, September to October for 2nd cropping.

Table 3.5 Preferences for Specific Brands of Yellow Hybrid Varieties and Yield Performance by Location, First Cropping Season, 1989 1/

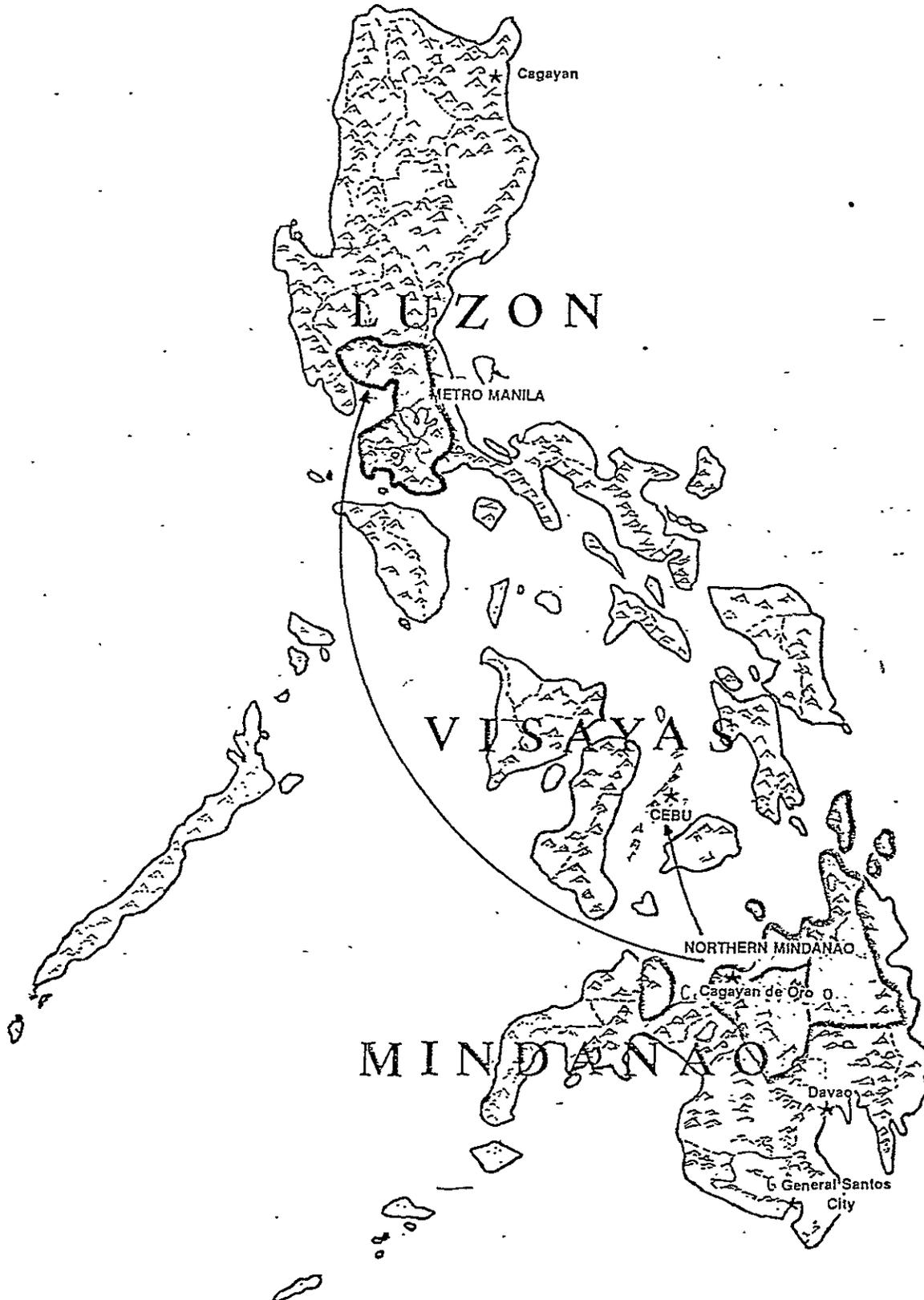
BARANGAYS	PIONEER	SMC	CARGILL
		(MT/Has)	
Hinaplunan		1.4, 2.5, 2.6, 2.6, 2.9	
Ane-i	2.2, 2.8, 4.0, 4.0, 4.3	6.2	
Magsaysay	3.2, 3.7		
Aglayan	3.9, 4.0, 4.5, 4.5, 5.3, 6.8		
New Visayas	3.0, 5.5	2.3, 2.7	
Pualas		1.4, 1.5, 1.8	
Kibaning	5.3	2.6	3.0
Lampanusan	4.1, 4.5, 4.5	2.8, 5.8	
Milaya	2.6	1.3, 1.4, 2.6, 5.4	
Katutungan	3.4, 4.1, 4.5, 6.1		4.3

1/ Actual yields in research sites.

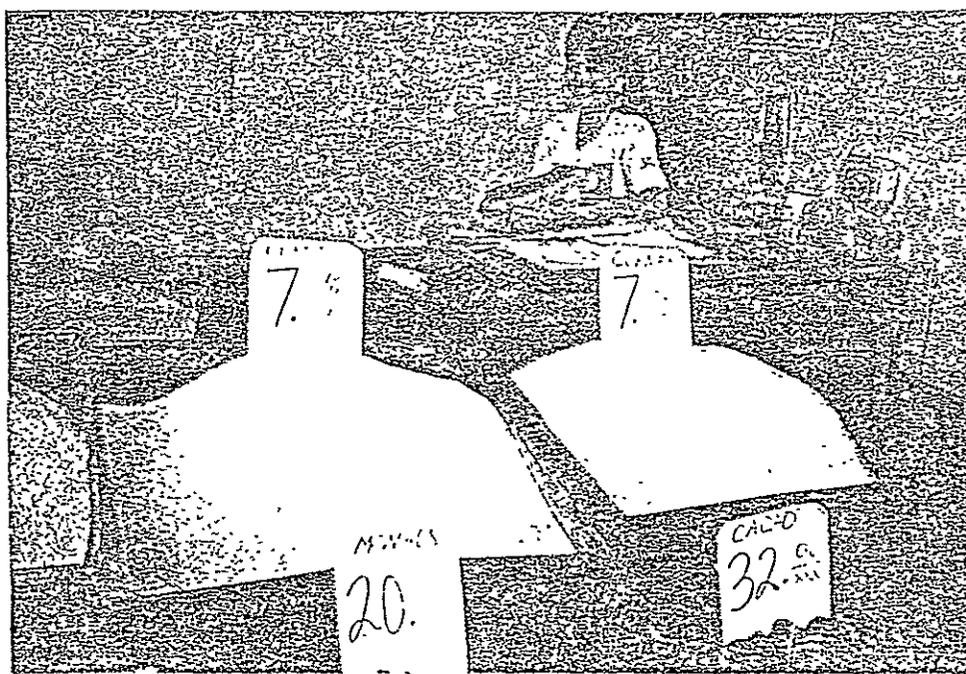
Source: Farmer Interviews

Figure 3.4

Major Supply and Demand Areas as Research Sites



a. Food Use Local custom and commercial corn millers processed white corn grains into grits for food. In the rural municipalities selected as "supply" areas, namely Claveria, Malaybalay, Valencia, Don Carlos and Kalilangan, eleven sample "custom millers" primarily serviced the corn-eating households in those areas with the less fine, #10 and #12 grades of grits. Small quantities of yellow corn were also milled into grits for staple food in some of the sample barangays due to the recent corn shortage and the emerging dominance of yellow corn in certain locations. In urban areas commercial millers sold some grits locally while shipping most of their grits to other locations. The 1981 consumption level of grits in Misamis Oriental and Bukidnon was estimated at an annual per capita average of 78 kilos and 58 kilos respectively.^{5/} For staple food, households used grade numbers 10 to 18 and cooked them either mixed with rice or as purely corn grits. However, households consumed mostly grade numbers 10 and 12 which were produced in greater quantity due to their higher milling recovery rate (about 26% and 20%, respectively). Grade number 22 or "tik-tik" which also has a



The flinty, desirable corn grits processed from native white corn varieties are a favorite among corn-grit-eating Filipinos.

comparatively high milling recovery rate (16%) was also consumed as food (usually cooked into porridge) but the main use was for hog and poultry feed. Generally, grade numbers 12 to 18 were targeted for Cebu market which preferred finer quality grits

Another food use of corn found in the region was for manufacturing cooking oil. Corn germ, a by-product of milling, was processed into corn oil by a large corn miller in Cagayan de Oro.

b. Feed Use In general, hog feed contains about 20% to 50% corn while poultry rations have about 50% to 75% corn. The hog raisers in the region mostly had their own feedmills and used varied amounts of local corn mixed with other feed ingredients. The local poultry growers, however, relied mostly on commercial feeds sold by local feed dealers who in turn, procured their supply from feedmillers in Cagayan de Oro and Cebu.

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^{5/} Based from the Department of Agriculture, Bureau of Agricultural Statistics, Food Consumption and Nutrition Survey, 1981.

Yellow corn was mostly used as a feed ingredient. However, whenever yellow corn was scarce, white corn was substituted but with carotene as an additive. The by-products of milling white corn, namely corn germ ("sungo") and corn bran were also used as feeds. Due to the high recovery rate of these by-products (about 25%), large corn millers shipped this to Manila or sold them to local hog raisers.

However, despite the region's being a major corn supply area, commercial feeds for the local hog and poultry raisers were inadequate. In 1988, a total of 176,857 bags of various types of poultry feeds and 23,418 bags of various kinds of hog feeds entered the port of Cagayan de Oro City.^{2/}

c. Demand for Meat and Poultry Products Demand for corn as feeds by the livestock raisers is positively correlated with the demand for meat and poultry products by the consumer households. Cagayan de Oro has experienced an increasing consumption of hogs and poultry products. From 1986 to 1988, the annual average increase of hogs slaughtered for human consumption in Cagayan de Oro City Abattoir was registered at 8%.^{2/} Local consumption for chicken meat was also noted by the poultry growers interviewed (Some buyers gave advance payments to growers as an incentive for supplying them dressed chicken). Records on the actual number of fowls slaughtered were not available because the new City Abattoir does not have a chicken dressing area. The region has not been self-sufficient in poultry eggs as indicated by the 1988 entry of 13.6 million eggs through the port of Cagayan de Oro from such sources as Cebu and Davao.^{2/}

1.2. Major Demand and Distribution Center Cagayan de Oro, the region's premier city and main trading center, plays a major role in the corn marketing system with more than 27 medium to large corn trader/shippers and corn millers located here, especially near the port area. A brief profile of Cagayan de Oro in Table 3.6 provides key features of this city. These large buyers of corn shipped mostly yellow corn grains to Manila and white corn grits to Cebu.

2. Cebu

Cebu City is primarily the major demand area for white corn and secondarily for yellow corn. The main users of white corn were the corn millers and the starch/oil manufacturers. Local feedmillers as well as backyard and commercial hog and poultry raisers used yellow corn as a major feed ingredient. The demand for corn both for food and feed uses had been increasing with the growing population of the Central Visayas region, especially of its large urban area, Metropolitan Cebu. Production of corn in the region historically could not meet this food and feed demand use. The region has relied mainly on Mindanao for its corn supply, particularly from Cagayan de Oro City, Davao City and General Santos City (the latter cities are in Southern Mindanao, Region XI). Cebu City, the second largest trading center in the country, is the site of various large processor/manufacturers of corn. (A brief profile of Cebu City is presented in Table 3.6).

^{2/} Provincial Veterinarian (Office, Macabalan Animal Quarantine Station, Cagayan de Oro City).

^{2/} Based from the only available data, the 1981 Food Consumption Survey for the region conducted by the National Food Authority - Department of Agriculture.

^{2/} Provincial Veterinarian (Office, Macabalan Animal Quarantine Station, Cagayan de Oro City).

1981 CAGAYAN DE ORO

Table 3.6 Profiles of Cagayan de Oro and Cebu City

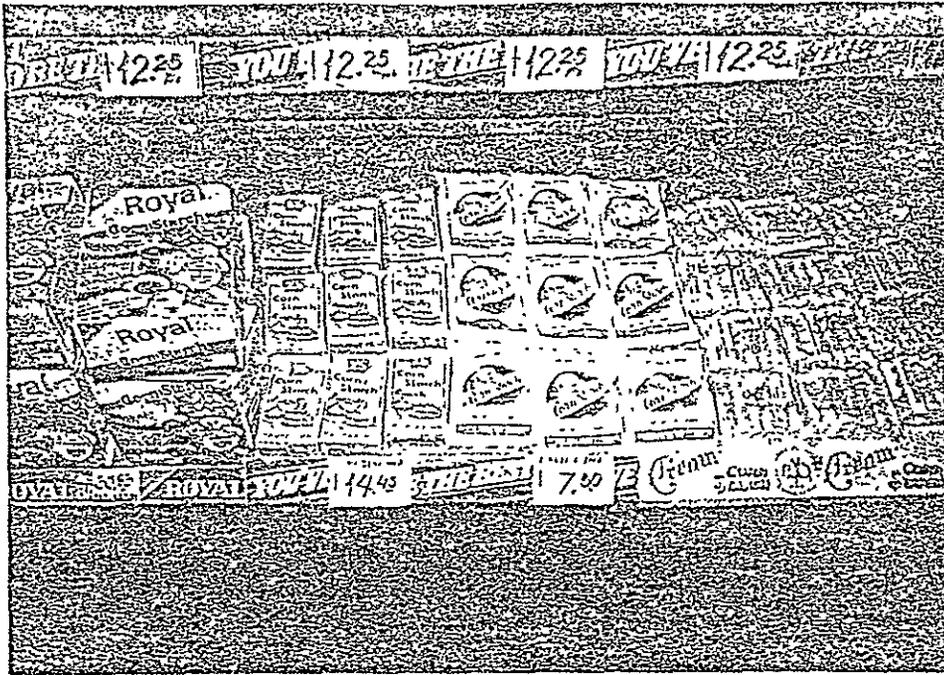
	Cagayan de Oro City	Cebu City
* Land Area (haa.)	49,630	32,800
* No of Barangays		
Rural	40	30
Urban	40	49
Total	80	79
* Population		
Rural	310,550	
Urban	68,170	
Total	378,720	625,250
Density (sq.km.)	763	1,909
* Road Network		
No of Kilometers	368,646.5	216,704
Condition	Concrete, asphalt, earth	Concrete, asphalt, unpaved, trail
* No. of Seaports	3	54 1/
* No. of shipping lines	6	
* Communication & Media (#)		
Telegraphic Company	7	6
LDT services	7	
Radio Stations	11	19
TV Stations	2	4
Local Newspapers	12	4
* Agriculture		
Crops	Corn Palay Vegetables	Corn Coconut Sugarcane Palay
Animals	Ducks Chicken Hogs Carabao Cow Goat	Hogs Goats Cow Carabao Ducks
* Manufacturing	Handicraft Metal craft Furniture Garments Ceramics Food processing Capra processing	Grain mill product Bakery product Food processing Garments Soft drinks Rattan and buri craft Metal craft Shell craft
* Commerce and Industry		
Business Establishments (#)	5,576	18,670
Banking Institutions(#)	30	55 1/
* Power Source	-Misamis Oriental Rural Electric Cooperative -Cagayan de Oro Electric Power and Light Cooperative	-Visayan Electric Cooper.

1/ The figures represent the total for the whole province of Cebu including Cebu City.

Sources: Socio-Economic Profile, City of Cagayan de Oro (1986-1987)
City Profile, PPDO, Cebu City, Region VII

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2.1. Food Use About nineteen corn millers in Metropolitan Cebu processed white corn grains into grits for staple food of approximately 80% of the province's population. Cebu City consumers preferred the finer grades of grits, i.e., #14 to #18. Another major use of white corn was for processing into corn starch by two large manufacturers in the city. Corn starch was further processed into noodles by several manufacturers in Cebu and Manila. Other types of food industries in Cebu City were corn oil manufacturing (three firms) and snack foods processing (one firm).



Another major demand for white corn is for starch manufacturing

2.2. Feed Use Of about nine feedmillers in Cebu City, the largest three processed corn into commercial feeds for hogs and poultry. Large hog and poultry raisers who processed their own feeds were end-users of corn. In general, corn consumed in feed formulations had such forms as corn grain, by-products of corn milling ("tik-tik" and corn bran) or starch manufacturing (gluten meal).

Recently, Cebu have had such a high demand for pork meat that live hogs were arriving from General Santos and Cagayan de Oro to meet this demand

3. Manila

Metropolitan Manila is the national capital and political/commercial center of the country. Along with its surrounding suburbs, Manila accounts for the largest demand area for corn due to the presence of about six large scale Integrators and many commercial livestock raisers in the surrounding regions. Large manufacturers of starch, snack foods, and other high-value products are based in the city. Manila's major sources of corn are Mindanao and the Cagayan Valley.

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MARKETING SYSTEM ORGANIZATION

The corn marketing system organization of Northern Mindanao extends to Cebu and Manila and is composed of the following sixteen major types of participants: corn farmers, hybrid seed companies, input dealers, grain traders, canvassers, trader/shippers, agents, feedmillers, corn millers (or processor-traders), starch manufacturers, corn oil processors, hog raisers, poultry growers, Integrators, shipping lines and the National Food Authority. A web of interrelated roles and relationships govern these marketing system participants who are active within the production, distribution, processing and consumption levels at specific supply and demand sites.

From 1986 to 1989, the main destination of corn grains and grits shipped from Cagayan de Oro was Cebu, with an average volume of outflow of 53.6 percent over this period. Corn shipments from Cagayan de Oro to Manila and to the other provinces in the Visayan region had an average outflow of 32.3 percent and 14.7 percent, respectively. Cebu procures corn grain and grits from secondary sources in other cities in Mindanao, specifically from General Santos, Cotabato and Davao.

The period 1985-1989 marked a vigorous market entry of traders, hog and poultry raisers and input dealers into the region's corn marketing system. Large commercial corn millers had a peak milling business from 1978-1980. Commercial corn milling appears to be a "sunset industry" from the Cagayan de Oro miller's perspective.

The system participants used a wide range of business strategies to compete in the corn market, both in the supply and demand sites. These business strategies included providing financing and support services to corn suppliers such as trucking and post harvest facilities and setting up a forward or backward integration for their procurement and sales operations. Product differentiation for corn grains as a market commodity is determined through their degree of moisture content while corn grits are usually distinguished in the market through specific brand names.

This chapter describes the organization, characteristics and the interrelated roles and relationships among the participants in the corn marketing system. The chapter also portrays the main trading patterns and geographic flow of the commodity, the nature of market entry and competition and aspects of product differentiation in the corn commodity.

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A. Participants

Participants in the corn marketing system were grouped according to their position in the commodity system, i.e., relative to the interrelationships within and between the production, distribution, processing and consumption levels. Sixteen important types of participants were recognized within the corn commodity system, namely: a) hybrid seed companies; b) input dealers; c) corn farmers; d) grain traders; e) canvassers; f) trader/shippers; g) agents; h) feedmillers; i) corn millers (processor/traders); j) starch manufacturers; k) corn oil processors; l) hog raisers; m) poultry growers; n) Integrators; o) National Food Authority; and p) shipping lines. Participants are discussed at the level of the commodity system where they were most active.

The July to September research period corresponded to the peak harvests during the first cropping season of 1989. For the first time since its establishment, the National Food Authority (NFA) did not participate in corn trading. The NFA is the government agency mandated to buy corn in order to stabilize prices and supply of that grain commodity. That season, the market prices did not drop below the government floor price of P 2.90/kg such that private traders and/or end-users absorbed the entire supply.

Other participants with less prominent roles in the corn commodity system included retailers of the grains and/or grits, slaughterhouse operators, meat-retailers and meat processors.^{1/}

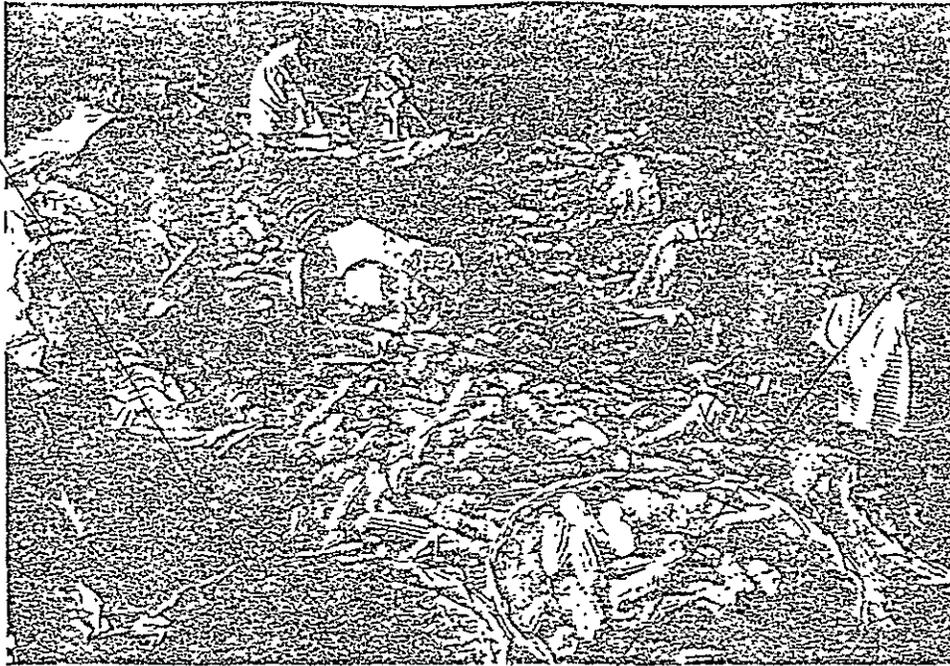
1. Northern Mindanao

1.1. Production Level Hybrid seed companies, input dealers and farmers were the main marketing participants interviewed at the production level.

a. Hybrid Seed Companies The hybrid seed companies have played an increasingly active role in Region X's corn production system as the high-yielding hybrid yellow seed variety offered farmers an opportunity to obtain higher returns. Given this background, the study mainly centered on the hybrid seed companies' market activities in the region.

^{1/} These specific participants in the corn marketing system were not given lengthy consideration in this section.

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Workers in a hybrid seed company select good quality corn grains for seeds.

Type of Outlets Three hybrid seed companies are active in Bukidnon, the region's top corn producing province. All have service centers within the region's main trading center of Cagayan de Oro City. Two have established their headquarters and service or marketing centers in Malaybalay, the provincial capital and most developed municipality of Bukidnon. One company expanded its service outlets to the corn farm municipalities of Don Carlos, Cabanglasan and Wao. The third company established a seed processing plant and distribution center in the nearby barangay of Bangcud.

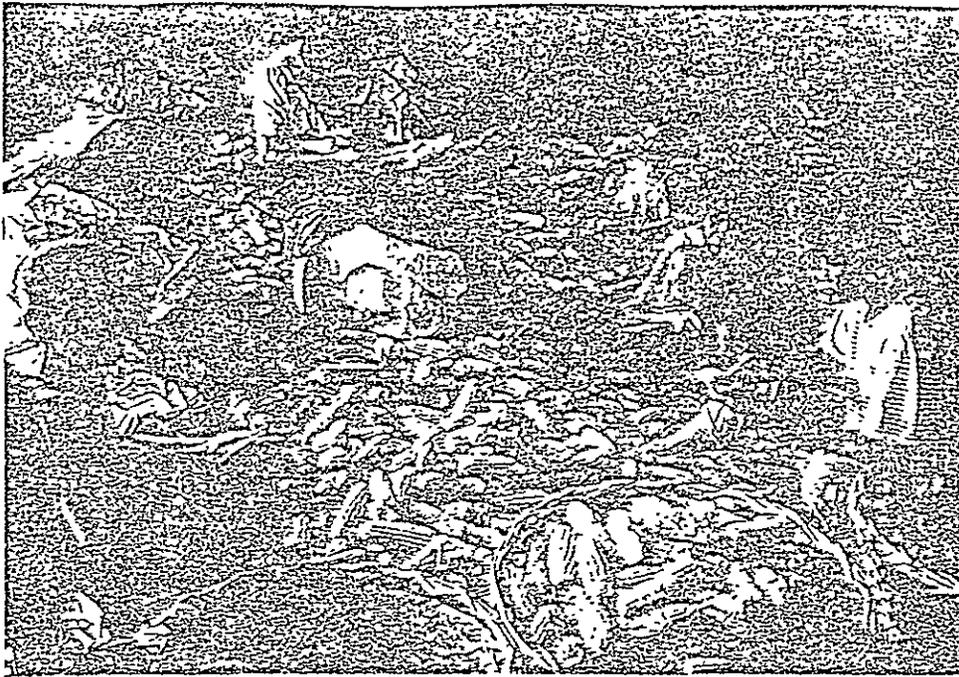
A brief review of the hybrid corn industry in Bukidnon, including promotion strategies practiced by the three hybrid seed companies are presented in Attachment C.

Product Promotion Seed companies relied heavily on input dealers for sales and distribution. To attract more outlets, one sold large quantities on consignment basis, payable after the cropping season's harvest. At the farm level, another seed company deployed production technicians to service farmers who used their seeds. Sometimes technicians from that seed company also serviced farmers using the competitor's brand due to farmers' insistent requests for technical assistance. Some seed companies also provided farmers with soil sample tests or analysis as a free service when participating in their seed multiplication program.

Seed companies vigorously competed in their focus on marketing strategies either through sales and price promotion or through research and technical assistance. However, it is believed that the official merger of the two major hybrid seed companies in November, 1989 is likely to change the competitive environment that has recently invigorated the hybrid seed industry.

b. Input Dealers Input dealers were classified into the "formal" outlets composed of the licensed dealers or owners of agricultural supply stores and the informal outlets, composed of corn trader/financiers who offered seeds and fertilizers to farmers on credit in order to gain or

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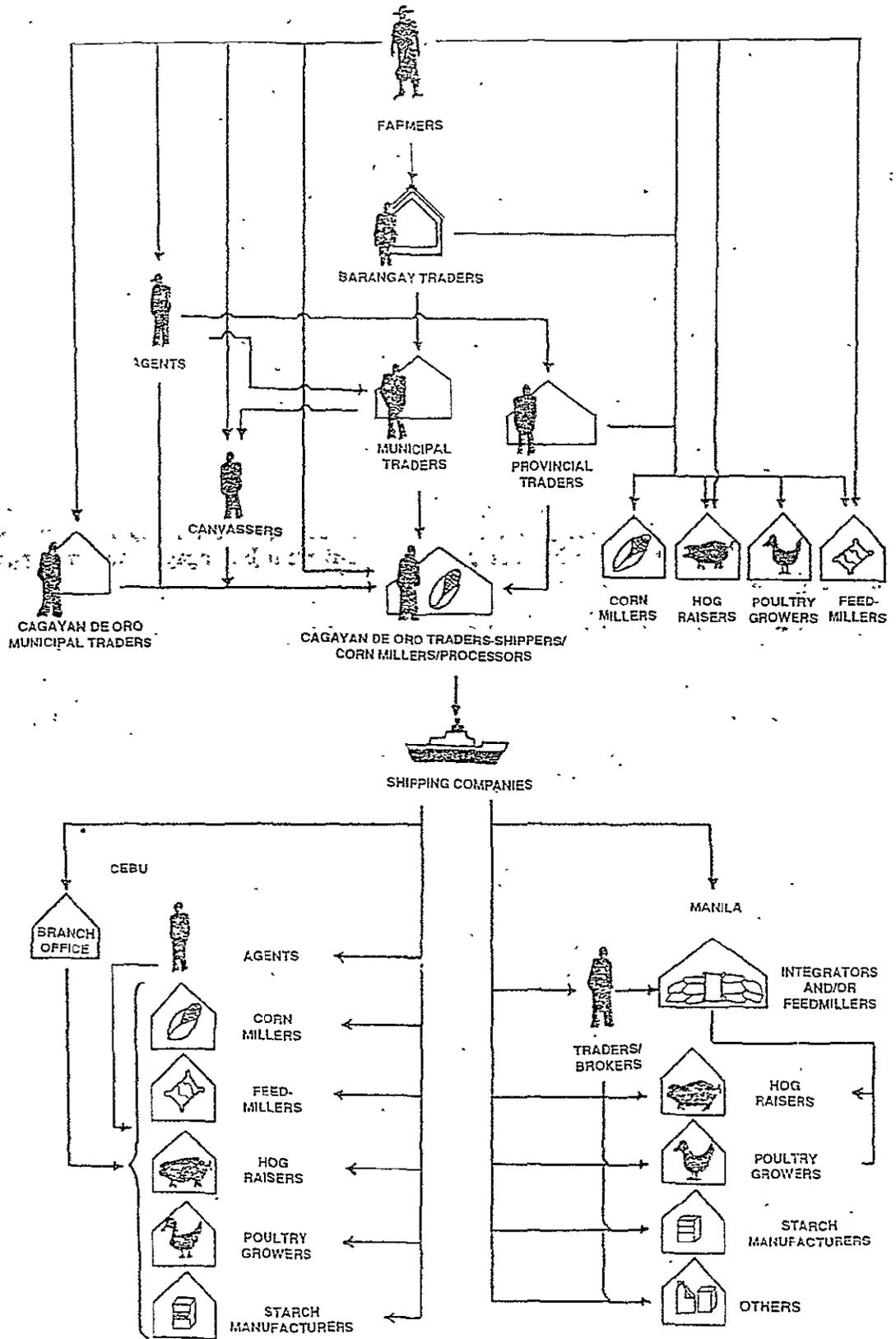
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Figure 4.1

Flow of Corn from Northern Mindanao,
Type of Buyer and Location

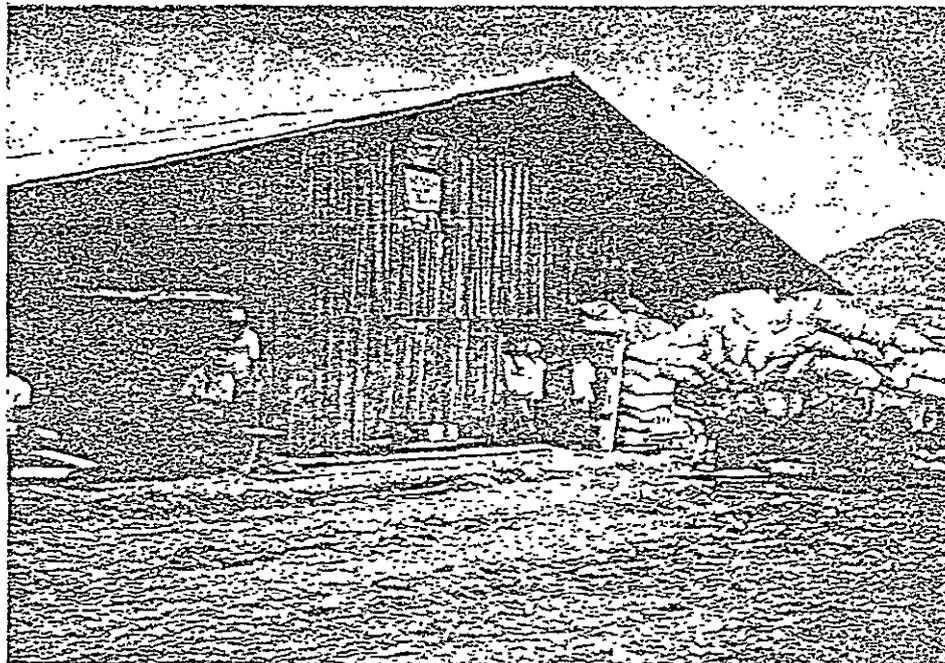


TREK
MAJAJAVA

Barangay Traders These were small traders residing in the barangay who bought corn from neighboring farmers and harvesters. A majority of the barangay traders (88%) owned a small "sari-sari" store where they offered consumer goods on credit to "suki" farmers with whom they have a personal relationship based on long standing credit/marketing arrangement. Credit repayment was done on a charge-to-crop basis upon harvest. For interior barangays, the larger traders of this type were farmers who had diversified into related services, such as operating a custom mill or corn sheller and/or serving as agent for a financier that supplied agricultural inputs on credit. Barangay traders sold to larger traders either within their municipality, province or in Cagayan de Oro City.

Barangay traders were important "first handlers" group since their proximity to the farm substantially reduced small farmers' transport costs in selling their corn. Those who owned "sari-sari" stores helped in the daily sustenance of small farmers by extending household goods from their stores on a three to four month (harvest time) credit term. Often the traders at this level were referred to as "Ahente" or agents of much larger traders who would provide trusted barangay traders with cash advances to buy corn on their behalf. This type of agent differed from the larger traders' employees who accompanied trucks that roamed interior areas paying cash for newly harvested corn.

Municipal Traders These were medium-large scale buyers of corn and other local agricultural commodities. They were mostly based in the municipality's "poblacion" or town center. They usually bought corn either directly from farmers or through barangay traders in their own and or the neighboring municipalities. Most of them were also engaged in farming and operated such businesses as a hardware store, grocery store, mill and/or an agricultural supply store. A majority (80%) of those interviewed owned trucks that picked up corn from barangays and transported them to Cagayan de Oro City.



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A few municipal traders were located in barangays outside the town's "poblacions", such as Ane-i (Claveria), Aglayán (Malaybalay) and New Visayas (Don Carlos). These particular traders had seemed to have better accessibility to the farmers against most municipal traders. Another unique group of municipal traders were found in Cagayan de Oro City near two public markets. Farmers and barangay traders from neighboring interior areas delivered jeepney loads of 20-30 sacks of corn and other agricultural commodities to these small buying stations situated along the road to or in those market places.

Five municipal traders in Malaybalay, Don Carlos, Maramag and Wao who had relatives who served as sales outlets had a corn business trading in Cagayan de Oro. This meant that information on market conditions and prices could be sent from CDO daily.

Due to their greater accessibility to the production areas and their capability to pick-up farmers' corn and transport it to Cagayan de Oro, municipal traders could be considered the main assemblers/suppliers of corn to Cagayan de Oro.

Provincial Traders These large traders owned trucks used to pick-up corn from municipalities throughout the province and transported them to Cagayan de Oro City. Few in number and diverse in business interests, most were found in Wao and Kalilangan. The reason being that these two adjacent settlement municipalities had particularly large corn areas and were situated near Banisilan (Lanao del Sur), another major corn area.

b. Canvassers Historically, canvassers have played an important role in the distribution of corn from supply areas to CDO buyers. The two main types of canvassers were the smaller part time type who met trucks coming from Bukidnon and Wao and tried to convince them who had the best buying price and directed them to the client's bodegas. The larger canvassers maintained a broad network of rural clientele serviced by price information as well as CDO services. CDO services included sales of corn, collection and deposit of sales revenue and purchasing of inputs/consumer goods for the backhaul. These large canvassers rented-out trucks to large farmers and municipal traders located in the southern municipalities of the region. Due to the long distance and lack of public communication facilities in the southern corn growing municipalities, access to daily price information was irregular and initiation of marketing arrangements was difficult unless one traveled to CDO. Trucking services in the region were also limited. Thus, the canvassers alleviated the critical need for daily price information (highest bidder), trucks and reliable sales without the farmer spending days on the road.

Another important role that a few large canvassers performed was providing credit to large farmers and small traders. This credit-marketing tie-up further ensured their market share of corn supply.

Canvassers were mostly active within the corn marketing system during the peak harvests (July-September) when transport was critical. During this period Cagayan de Oro City traders usually paid them an incentive commission of about 3 to 5 centavos per kilo of corn grain delivered to them. As the number of traders in CDO increased, so did the difficulty in finding the "best" daily price. Thus, the role and influence of large canvassers increased with the growing corn market in the region. However, the role seems subdued for the public sector because, unlike traders, canvassers are not required a license to operate their brokerage service.

c. Trader/Shippers Trader/shippers were the biggest traders in the region who bought corn grain directly from large farmers, municipal and provincial traders or through canvassers. They regularly shipped to Cebu and/or Manila. A total of eight large scale trader/shippers were located in Cagayan de Oro City near the road leading to the region's major port. Corn trading was their main line of business with copra, cassava and palay as secondary product lines. To support their large scale operation, many provided credit to farmers and traders. All owned several long haul trucks for transporting corn from the production areas to their large drying and storage area. They also maintained another fleet of old trucks to take their sacked corn to the dock storage area. Two trader/shippers had relatives acting as buyers in Bukidnon. This formal "backward integration" to the supply area substantially increased the volume of their corn procurement. Other trader/shippers had relatives or branch offices in Cebu who searched for sales opportunities and took charge of corn arrivals and deliveries to buyers in that demand area.

According to type of ownership, four of the eight trader/shippers in Cagayan de Oro were single proprietorships, two were family (close) corporations and two were open corporations (Table 4.1). Management patterns varied according to type of ownership (Table 4.2). Single proprietorship firms had an informal management style such that trading arrangements could be effected verbally. Usually the manager himself started the business - a "first generation" manager who relied mainly on his experience or training for important business decisions. This type of firm had a personalized relationship with financed "suki" farmers and traders so that their credit-marketing tie-up helped them maintain their market share.

Family corporations had a semi-formal business management style where immediate family members managed the firm. Usually a "second generation" or younger manager with a higher level of education and training worked with the "first generation" manager or most senior member of the family. The balanced combination of aggressive and innovative business orientation of the "second generation" manager with the cautious and more comprehensive outlook of the "first generation" manager worked well for these family corporations. These firms also financed "suki" farmers and traders to ensure a steady supply of corn. Trading arrangements varied from verbal negotiations to written contracts with the former mostly for grain procurement arrangements and the latter for sales to distant buyers.

Two firms had a corporate type of ownership and served as branches to their offices in Cebu and Manila. Their management style was formal with highly experienced and trained managers at the top organizational structure. With their less personal business style, especially on the sales sides, they did not finance farmers and traders and traded mostly through the "spot" market with verbal and written contracts.

1.3. Processing Level Participants within the processing level in the region included corn millers, feedmillers and corn oil manufacturers.

a. Corn Millers Corn millers who processed white corn grain into grits as staple food had three classifications: a) custom millers, b) custom/commercial millers and c) commercial millers.

Table 4.1 Corn Shippers in Cagayan de Oro City and Bukidnon, by Type of Ownership and Generation of Manager ^{1/}

LOCATION/ CLASSIFICATION	TYPE OF OWNERSHIP AND GENERATION				TOTAL (N)	
	Single Proprietorship		Family Corporation			Corporation
	1st Generation	2nd Generation	1st Generation	2nd Generation		
A. Cagayan de Oro City						
Trader/shippers	3	1		2	2	
Processor/traders				3		
B. Bukidnon						
Processor/traders				2		

1/ Managers were characterized either as "first generation"; i. e., the manager started/established the business; or a "second generation", i. e., the manager was a younger member of the family where his father/elder member of the family started/established the business.

Source : Interviews

Table 4.2 Management Patterns of Firms Interviewed
in Supply and Demand Areas

CHARACTERISTICS	T Y P E O F F I R M		
	Single Pro- prietorship	Family Corporation	Corporation
Organizational structure	Informal	Semi-formal	Formal
Managerial Skill	Based on Experience	Experience with Training	Experience with Training
Decision-making Process:			
Basic nature	Individualized	Centralized	Decentralized
Number of persons consulted for major price change	Self	One or two	Few depending on situation
Time required for major pricing decision.	Less than 1 day	1-2 days	Few days
1/ Support to Farmers	Financed many farmers	Financed few farmers	Not financing farmers
2/ Support to Traders	Finance some prov'l/mun./ brgy. traders	Finance some prov'l/mun./ brgy. traders	Not financing traders
Trading Arrangements	Verbal	Verbal and written	Verbal and written
Dominant Relationship to Sellers	Suki (personal)	Suki (personal)	Spot market (impersonal)

1/ Only applies to trader in/near the supply areas.

2/ Excluding municipal traders located within the CDO proper.

Source : Interviews

Custom Millers These millers only provided small scale milling services for grains delivered to their mill. They were not engaged in buying grains to process and sell. Most custom millers were found in the barangays or "poblacions". They milled grits for the consumption of farmers and their families. At the small custom mills, local women and children and some farmers form a line to await their turn for the laborers to mill the 10 kgs or less of corn they bring. then they pay in kind, usually milled by-products, corn bran and "tik-tik" Custom millers later sell the milled by-products to retailers or neighboring hog raisers.



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Small farmers with less than a sack of corn await their turn at the custom mill.

An exceptional case of custom milling was a large miller who received grain from and milled for a wholesaler of grits in Cagayan de Oro. Payment for this large custommiller was in cash.

Custom/Commercial Millers These were medium to large scale millers engaged in both custom milling services and in buying and processing white corn grains for sale as grits. They provided the custom milling needs of small farmers or their families but were mainly into large scale corn grain buying, milling and selling grits and by-products to nearby wholesalers-retailers. To ensure a market share, they financed inputs to reliable "suki" farmers and provided services such as shelling, drying and transportation.

Two large custom/commercial millers located in Malaybalay and Valencia, Bukidnon had optimized their proximity to the production areas by also trading in yellow corn grain. One became an integrator by engaging in small scale hog raising and used the by-products from milling for feeds.

Commercial Millers or Processor/Trader/Shippers Commercial millers bought large volumes of white corn grains and processed them into grits for shipment to the island provinces in the Central Visayas region, especially Cebu. They were also referred to as processor/traders because, apart from milling and shipping grits, they bought and sold yellow corn grains to a limited extent.

Three processor/traders were based in Cagayan de Oro City while two operated in Bukidnon. Two had integrated forward to Cebu by putting up sales offices in that demand center. Both financed farmers and traders and maintained several trucks to transport corn from farms to their mill site. Commercial millers, at times, require the services of canvassers to procure adequate corn stock for milling.

All processor/traders were family corporations where a younger or "second generation" family member helped manage the business. Moreover, they were not solely engaged in the corn milling business, especially since most of them considered the business a "sunset" industry. In fact, all had recently invested in a booming real estate and construction industry. One enterprising processor/trader had long ago engaged in the reconditioned trucks and tractors business.

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b. Processor/Trader and Corn Oil Manufacturers One processor/trader was also engaged in manufacturing corn oil. Like many large buyers of corn based in Cagayan de Oro, at times it dealt with canvassers to ensure adequate supply of corn. This family corporation had also invested in non-agribusiness enterprises such as real estate, construction and service facilities.

c. Feedmillers A branch mill of one integrator and a cooperative mill were the region's two feedmillers operating in Cagayan de Oro. The large integrator's mill was processing feeds for commercial sale and served as a base for expanding its poultry operations. The hog and poultry raiser's cooperative mostly allotted the feeds it manufactured for the members' use with only a small percentage sold commercially. Local medium and large hog raisers operated hammer mills for processing their own feeds.

The commercial feedmiller/integrator procured corn mostly from large farmers and municipal traders. Instead of financing farmers and traders, as practiced by many large buyers in Cagayan de Oro, this feedmiller offered a higher buying price for corn delivered to his feedmill to ensure a steady corn supply.

The cooperative feedmill is the first and only one of its type established in the region. By pooling resources for procuring corn and feedmilling, the members of the hog raisers cooperative ensured economies of scale to maintain adequate feed stocks for their hogs. The cooperative usually bought corn from nearby Cagayan de Oro traders and not from farmers to eliminate trucking and credit/financing costs to farmers.

1.4. Consumption Level The two main end-users of corn were: a) the region's human population who ate corn either as grits for their staple food or as corn on the cob and b) hogs and poultry which consumed feeds with corn as major ingredient. For the consumers of grits, the latest data available on their consumption level was from the 1981 NFA food consumption survey. This section focuses more on the region's consumer of feeds, the hogs and poultry raisers who were classified into those who raised hogs only, poultry only, or both.

a. Hog Raisers The two main categories of hog raisers in the region were the small scale commercial raisers, and the medium and large commercial raisers.^{2/} All types usually marketed live hogs or finisher hogs with weights between 80 to 85 kilos (Figure 4.2).

Small Scale Commercial Raisers These raisers had a sow level of up to 10 heads of mostly native breeds. Only a few raisers had upgraded or improved hogs by crossbreeding. Most maintained small corn farms and used the mill by-products for feeds. Management operations were handled by the owners themselves who relied mainly on their personal experience or training. They sold the hogs within their locality or in nearby municipalities.

Medium and Large Commercial Raisers Medium scale raisers had 11 to 300 head sow level while large raisers had more than 300 head sow level. Hybrid hogs were their primary product. Although they sold some hogs to the local buyers, most of their "finishers" were shipped either to Manila or more recently, to Cebu. A few of them sold in carcass form or as processed meat for the local market. These raisers were considered as the "small integrators" because of their integrated hog farm operations, feedmilling, marketing and administration.

All commercial raisers had hammer mills or feedmills and mixed their own feeds. They usually bought corn directly from farmers. With their large scale operation, a specific department was responsible for purchasing corn and other feed ingredients.

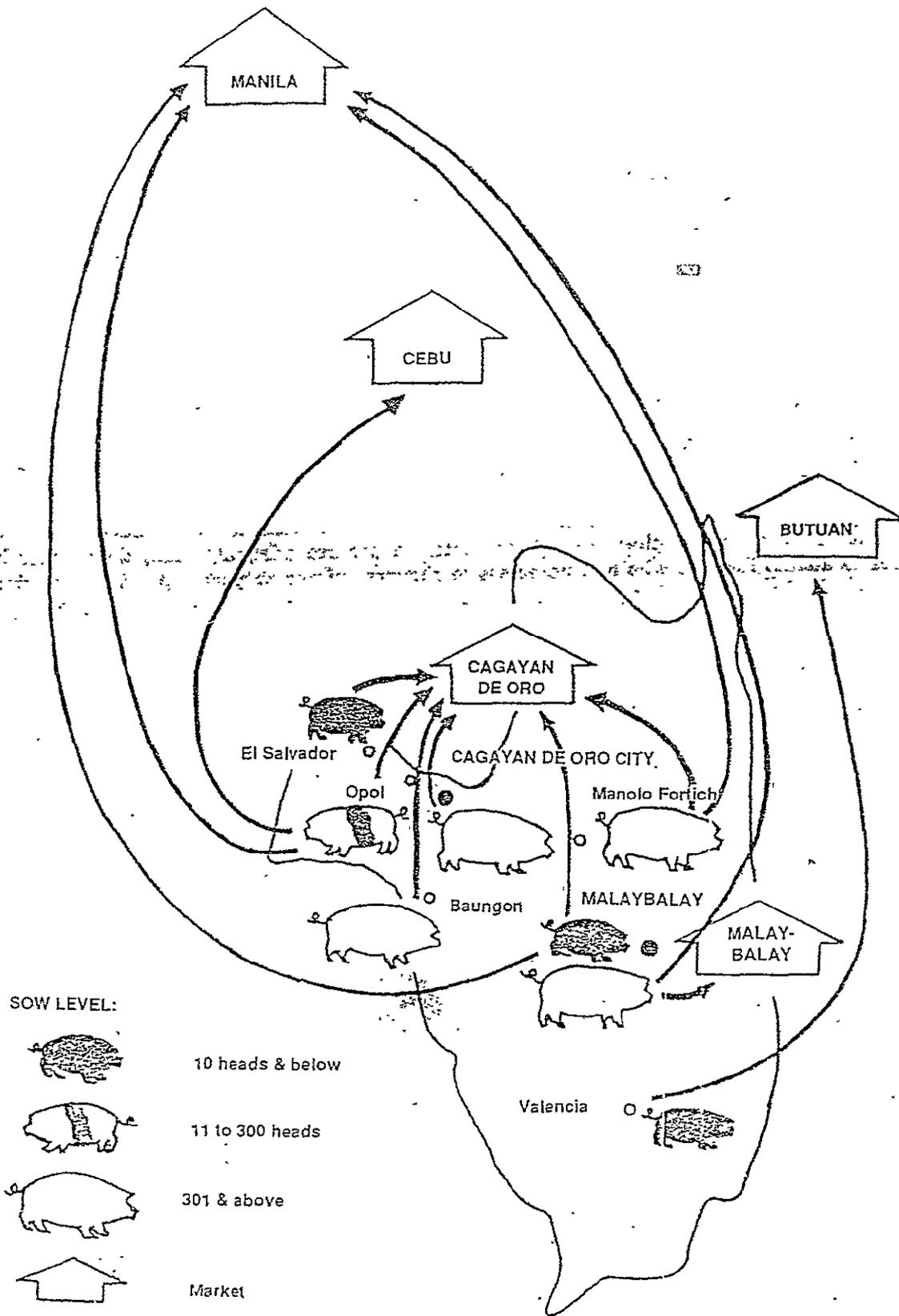
This department monitored the stocks and prices for present and future use and classified the quality of corn and other feed ingredients. To procure adequate corn, they either bought corn in cobs to attract farmers who had no access to shellers, offered to pick up their corn from the farm for free or offered a buying price equal to the prevailing price in Cagayan de Oro. Generally they did not finance farmers.

Commercial hog raisers were strategically located in the northern municipalities highly accessible to both Cagayan de Oro City (approximately within 30 kms distance from this main trading and shipping site) and the corn supply areas. Experience showed that commercial hog raising was not viable in the region's southern municipalities due to their distance from the market and the rugged road condition. High transport costs to bring certain feed ingredients and medicines to the farms and to ship live hogs from those farms to Cagayan de Oro City, along with animal stress and weight loss during delivery, were among the constraints cited by former hog raisers in the southern municipalities.

Three commercial raisers in Bukidnon used hog manure to fertilize their coffee plantation and one in Opol, Misamis Oriental used it for his corn farm. Another raiser in Bukidnon utilized the hog manure as biogas energy to fuel his mechanical corn dryer. Of the four commercial hog raisers interviewed, two were family (close) corporations and two were open corporations.

^{2/} These were modified classifications based on a combination of the categories used by the Development Bank of the Philippines and the research team's assessment of the sample raisers.

Figure 4.2 Location of Piggeries, Production Capacities and Market Distribution



b. Poultry Growers Poultry growers sold both eggs and/or dressed chicken meat. In the region, growers were classified as either small scale or large commercial growers, according to the type of business and number of heads of layers or broilers

Small Backyard Growers Backyard growers with less than 2,000 heads of layers and/or broilers were the most common type in the region. Of the five small growers interviewed, three were located in Malaybalay, Don Carlos and Valencia within Bukidnon province and two were found in Bonbon, Cagayan de Oro. Two were engaged in the production of broilers only and one in both layers and broilers. Owners were proprietors who relied mostly on their training and/or experience for management. Many operated small "sari-sari" stores where they sold table eggs. They mainly depended on nearby agricultural/feed supply stores which also served as market outlets for their eggs.

Poultry growers in Bukidnon utilized chicken dung for their own farms while those growers in Cagayan de Oro and Misamis Oriental sold the chicken dung to tomato growers in Claveria at a profitable price range of P 60 to P 80 per bag.

Large Commercial Growers These growers had a layer size of 5,000 head or more and/or a broiler size of 10,000 head or more. Two large commercial layer growers operated in Valencia, Bukidnon and Opol, Misamis Oriental. Their main sources of commercial feeds varied between a Cagayan de Oro agricultural feeds dealer and a Cebu feedmiller. Eggs were sold to local buyers in the region. Chicken dung was either used in their farm or sold to tomato farmers in Claveria.

c. Raisers of Both Hog and Poultry Raisers of both hog and poultry were few compared to those exclusively engaged in either hog or poultry raising. In fact, only one animal raiser in Bukidnon was considered large for both hog and poultry while another raiser in Misamis Oriental was large in poultry but small in hog. The large hog and poultry raiser had a feedmill and procured corn from its own farm or bought from nearby commercial millers. The small raiser relied on commercial feeds from a Cagayan de Oro dealer. The former had a family corporation type of ownership while a younger or "second" generation family member managed the business.

2. Cebu

Marketing system participants in Cebu (the demand component for corn produced in Northern Mindanao) were classified within the distribution, processing and consumption levels. The interrelationships between the marketing participants in Cebu and Northern Mindanao are discussed in the subsequent sections on "geographic flow", "competition" and "marketing system operations".

2.1. Distribution Level In Cebu, the main participants at the distribution level were Cebu-based trader/shippers and sales agents representing Mindanao-based trader/shippers.

a. Trader/Shippers Four large scale trader/shippers based in Cebu had set-up buying stations in port supply areas, such as Cagayan de Oro, General Santos and Davao. This backward integration enabled them to provide cash advances and inputs to large farmers and small traders in Bukidnon in order to gain or maintain a share in the corn market while competing at CDO prices. Like several of their trader/shipper competitors in Cagayan de Oro, most were family corporations, except for one multi-national trading firm. Their buyers in Cebu were corn millers, feedmillers, hog and poultry raisers and starch manufacturers.

b. Sales Agents Sales agents served as brokers or sales facilitators for trader/shippers who were based in the corn supply ports of Cagayan de Oro and Davao. They searched for buyers in Cebu who offered the highest price and took charge of corn shipment deliveries at the port. Of the two large agents found in Cebu City, one supplied corn mostly to corn millers, starch manufacturers and feedmillers while the other mostly supplied a large hog and poultry raiser and a wholesaler-retailer.

2.1. Processing Level Compared to Northern Mindanao, Cebu had many more types and numbers of processors competing for corn, i.e., corn millers, feedmillers and manufacturers of starch, corn oil and snack foods.

a. Corn Millers Cebu and its neighboring island provinces have a predominantly corn-grit-eating population. This has prompted a relatively large number of commercial corn millers to locate in or near Cebu City. In Metro Cebu, seventeen commercial millers were reported, the largest ones are located in Mandaue and Talisay. They bought corn primarily from Cagayan de Oro and secondarily from General Santos and Davao. Five of the nine larger corn millers have "backward integration" to Cagayan de Oro City, i.e., they have established buying stations in this supply area and shipped corn to their mill sites in Cebu. A few of the "backward integrators" financed farmers and traders in Cagayan de Oro. Other millers who had no "backward integration" to Cagayan de Oro could not ship or procure corn grain directly from the production area and bought stocks from the local trader/shippers instead.

Like their Cagayan de Oro competitors, most Cebu millers were family corporations. Six of the nine larger corn millers sold grits to local wholesalers and retailers as well as shipped to neighboring island provinces with corn-grit-eating populace, such as Bohol, Leyte and Masbate. Mill by-products, (corn bran and "tik-tik") were mostly sold to the local hog raisers or feedmills while corn germ ("sungo") was sold to the local corn manufacturers. Thus, unlike the commercial corn millers in Bukidnon who were into hog raising due to their proximity to corn areas, Cebu corn millers were not diversified into hog raising. According to a corn miller respondent, the stiff competition for corn, among the various types of corn users in Cebu made it difficult to procure sufficient corn for their corn milling with little extra for hog raising. This difficulty has discouraged corn millers from diversification.

b. Feedmillers Of the three large feedmillers in Cebu, two were branch millers of Luzon Integrators. Although none had a procurement station in Cagayan de Oro, two had buying stations in General Santos. One of these procured mainly from General Santos City because its own port and shipping facilities were established there. The other two large feedmillers who mainly relied on corn from Cagayan de Oro bought from the local trader/shippers there and shipped commercial feeds back to Cagayan de Oro feed dealers as well as to a large hog and poultry raiser in Misamis Oriental.

An exceptional enterprise related to feedmilling was an agricultural supply store/feed dealer who used his training in animal nutrition and feed formulation to mix his feeds and sell mostly to the local backyard raisers. The unique feature of this enterprise was the rapid growth in the business based on aggressively searching for and servicing the large number of backyard piggeries that supply the Cebu market.

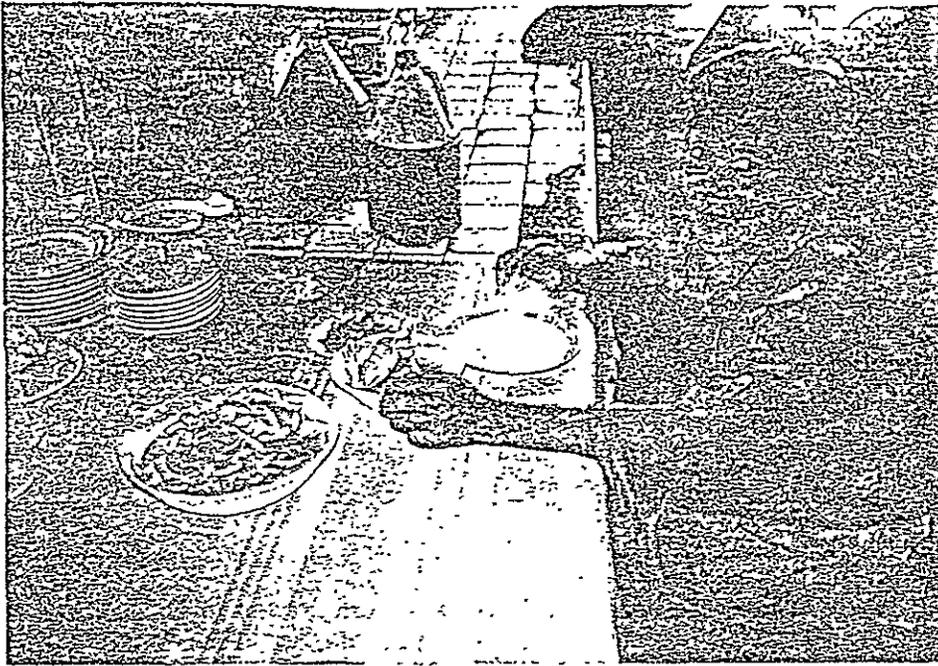
c. Starch Manufacturers and Other Food-Processors There were two large manufacturers of corn starch in Cebu. One manufacturer bought corn on a contract basis from large trader/shippers in Cagayan de Oro and General Santos while the other mostly relied on its buying station in General Santos. Both maintained a network of starch sellers in the demand areas of Cebu and Manila.

More than 10 noodle manufacturers in Cebu used local corn starch to process several types of noodles such as "bijon", "miki" and "odong". However, the main demand for corn starch came from Manila.

Another type of corn processing in Cebu was corn oil manufacturing. Of the three oil manufacturers, one utilized the corn germ extracted during the manufacture of starch and also processed other derivatives such as gluten for feed and glucose for caramel and syrup. Another corn oil manufacturer bought corn germ from both local and Mindanao based corn millers.

2.3. Consumption Level Households who consumed corn grits for their staple food and the hog and poultry raisers were the participants under this level.

a. Households/Consumers Cebu province as well as the neighboring island provinces of Bohol and Negros Oriental have traditionally been a corn-grit-eating populace. In Cebu City however, key informants cited that a substantial percentage of households had begun either shifting their diet to rice, or alternating their diet between rice and corn grits. The research team made informal inquiries of some workers in Cebu City (such as taxicab drivers, security guards, salesgirls, etc.) to determine whether any patterns of changing rice and corn-grits consumption could be noted. These candid interviews revealed that some residents had indeed begun alternating rice with corn for their staple food due to various reasons such as: a) when the price of corn grits reached that of rice, some shifted to rice; b) rice was offered by some large companies as a workers' fringe benefit, hence, consumer tastes had been gradually affected; c) the younger generation, especially children, mimicked colleagues preference for more rice; and d) people coming from rice-eating regions were creating a greater demand for rice with demonstrative effects on Cebuano neighbors.



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Corn grits form the staple food for most Cebuanos.

b. Hog and Poultry Raisers Although there were several medium to large hog raisers in Cebu, the major portion of hogs slaughtered in Cebu were from the small, backyard raisers. Slaughterhouse operators estimated over 60% were from backyard raisers. This is not so much different from Northern Mindanao where the medium to large scale raisers are not the dominant source of local pork. With regard to poultry growers, the trend was opposite. In Cebu, the large commercial growers provided the largest share of local poultry products compared to backyard growers. The contract raising approach of large poultry growers with ready access to commercial feeds and arrangements to sell large volumes each day in the local market places proved to be too much competition for backyard growers.

In general, hog and poultry raisers in Cebu were classified into those who raised hogs only and those who raised both hogs and poultry. No medium to large scale poultry growers who engaged in poultry only were found. All sample commercial poultry growers had already diversified into hog raising.

Small Hog Raisers Small scale hog raisers comprised the majority of the hog raisers in Cebu. Unlike Northern Mindanao's small hog raisers who raised mostly native hogs, these raisers usually raised improved breeds. For feeds, they usually used pollard, rice bran and mill products from local sources together with protein-based ingredients. Their main sales outlets were local traders and slaughterhouses as well as large companies on special contracts.

Medium to Large Commercial Hog Raisers Commercial raisers who raised hogs exclusively were fewer in Cebu than in Northern Mindanao. Only one exclusive medium and one large scale hog raiser were found in Cebu. The large hog raiser had a feedmill and bought corn primarily from Cagayan de Oro City and secondarily from General Santos City. Other feed ingredients were sourced from Manila and a substantial portion of its live hogs were regularly shipped to Manila.

Biogas technology was being eyed by both hog raisers. At present, systematic use of hog manure is not so common. However, one case of animal-plant-animal system was noted whereby hog manure was applied to Napier grasses which in turn was fed to cattle.

Large Raisers of Both Hog and Poultry Unlike Northern Mindanao where the large hog raisers concentrated on hogs only, the large hog raisers in Cebu were mostly diversified into large poultry businesses. In effect, all the five large poultry growers in Cebu were also into medium to large commercial hog raising. Two of the large firms produced between 30,000 to 65,000 broilers. One of those raisers also operated a breeding farm and supplied improved junior boars and gilts and day old chicks to commercial raisers in Northern Mindanao.

For the large hog and poultry raisers, corn was procured either from agents, a local processor/trader/shipper with a CDO buying station or a local wholesaler-retailer who also supplied them their other ingredients. Two bought their own feed ingredients directly from Manila, a similar practice of the large hog raisers in Northern Mindanao.

B. Spatial Network

The two major components of the spatial network are the geographical flow of grain and other related products and the trading patterns among those in the network.

1. Geographical Flows

The analysis of the commodity movement included both corn grains and corn grits as well as hogs which were directly linked to corn as a higher-valued consumer. The participants involved and the modes of transport used are also discussed in the commodity flow.

1.1. General Flow of Corn from Northern Mindanao to Cebu and Manila The general flow of corn, either as grains or grits followed four distinct patterns: 1) transport by trucks from the farmers either indirectly to CDO through various channels composed of the intermediate grain traders, (i.e., barangay, municipal or provincial traders) or directly to CDO traders by farmers themselves, by trader/shippers and/or processor/trader/shippers based in Cagayan de Oro; 2) tramp or container vessels shipments from Cagayan de Oro port to ports of the demand areas of Cebu and Manila; 3) handling and distribution of the commodity among the various types of buyers within the demand areas of Cebu and Manila; and 4) fully integrated channels (Figure 4.1).

Most sample farmers, regardless of their farm size and location, sold their corn to the municipal traders. However, farmers located within roadside barangays clearly had more sales options for their corn due to their greater access to various market outlets, including Cagayan de Oro.

Barangay traders channeled their corn either to the municipal, provincial or Cagayan de Oro traders. In turn, the municipal/provincial traders sold their corn to the large trader/shippers, processor/traders and/or feedmillers in Cagayan de Oro. When the corn from the barangay, municipal or provincial traders located in the distant supply areas arrived in Cagayan de Oro, canvassers offered to channel it to the highest priced buyers on behalf of several suppliers. The detailed flow of corn from sample municipalities in Bukidnon to Cagayan de Oro is shown in Figure 4.3. In addition the detailed flow of corn from the interior and roadside barangays sampled to the various buyers within the region is presented in Appendix 15a - 15e.^{2/}

Cagayan de Oro-based trader/shippers and processor/traders shipped out their corn grain and grits to the major demand areas of Cebu and Manila, and to other island provinces in the Visayas. Figure 4.4 shows the detailed flow of corn from Cagayan de Oro to Cebu.

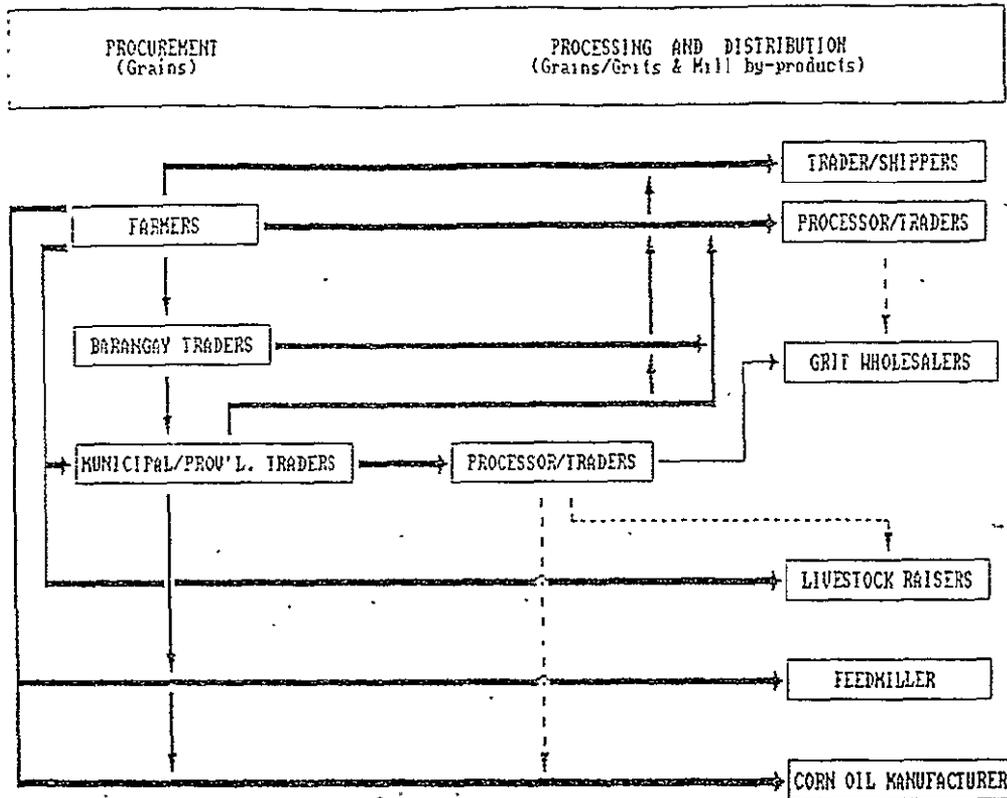
Within the demand area of Cebu, corn grains were transported from the port directly to the various processors, i.e., corn millers, feedmillers, livestock growers and starch manufacturers. Some Cagayan de Oro trader/shippers had an agent or branch office in Cebu which facilitated their arrival, distribution and sales. Many large Cebu corn millers had buying stations in Cagayan de Oro.

a. Volume of Corn Outflow from Cagayan de Oro to Cebu, Manila and Other Demand Areas The charts of the yearly outflow of white corn grains, yellow corn grains and white corn grits from Cagayan de Oro to Cebu, Manila and other demand areas outside the Northern Mindanao region, from the year 1986-1989, are presented in Figures 4.5 to 4.7. The main destination of white corn grains from Cagayan de Oro City was Cebu City, with an average of 80.0 percent of the total outflow registered during the recent four years. In contrast, most of the yellow corn from CDO was shipped to Manila, with an average outflow of 60.0 percent during the same period. The second demand center for yellow corn from CDO was Cebu, with an average outflow of 35.8 percent posted. On the outflow of white corn grits, close to one-half of the total grits coming from CDO was shipped to Cebu or an average of 45 percent over the same period (Appendix 16). The second demand center for grits shipped from Cagayan de Oro were the island provinces in the Visayan region (an average outflow of 30.8 percent), particularly Tagbilaran and Jagna (within the province of Bohol, Region VII). The rest of CDO's grits (24.2 percent) was shipped to Manila. Overall, during the 1986-1989 period the main destination of corn grains and grits shipped from the Northern Mindanao region was Cebu (an average outflow of 53.6 percent), followed by Manila (32.3 percent) and thirdly, the other island provinces in the Visayan region.

b. Volume of Corn Inflow to Cebu from Various Sources Figures 4.8 to 4.10 show the yearly inflow from 1985-1989 of white corn grains, yellow corn grains and white corn grits to Cebu from various sources such as Cagayan de Oro, General Santos City, Cotabato City and Davao City

^{2/} The National Food Authority - Region X monitors two major sources of inflow of corn to Cagayan de Oro, i.e., from Bukidnon and Wao, Lanao de Sur. However, the data available are incomplete to accurately determine the volume of inflow from these two major sources of corn to Cagayan de Oro.

Figure 4.3 Flow of Corn from Bukidnon to Cagayan de Oro City



LOCATION:

Municipalities of Bukidnon:
Malaybalay and Don Carlos

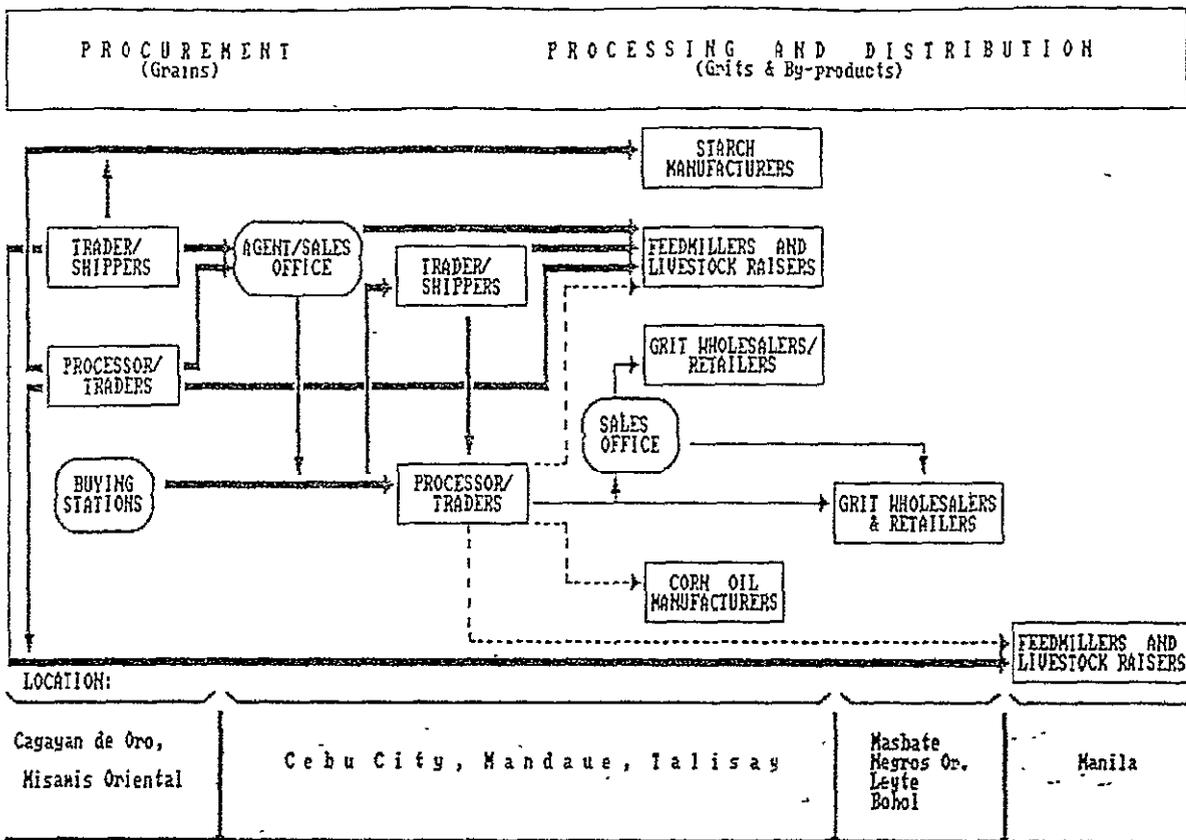
Cagayan de Oro,
Misamis Oriental
Gingoog, Misamis,
Oriental
Manolo Fortich,
Bukidnon

Legend:

- Yellow & White Corn Grain
- Corn Grits
- > Mill by-products ("tik-tik", corn bran, etc.)

Source: Interviews of farmers, traders and corn millers

Figure 4.4 Flow of Corn from Cagayan de Oro City to Cebu City and Other Demand Areas

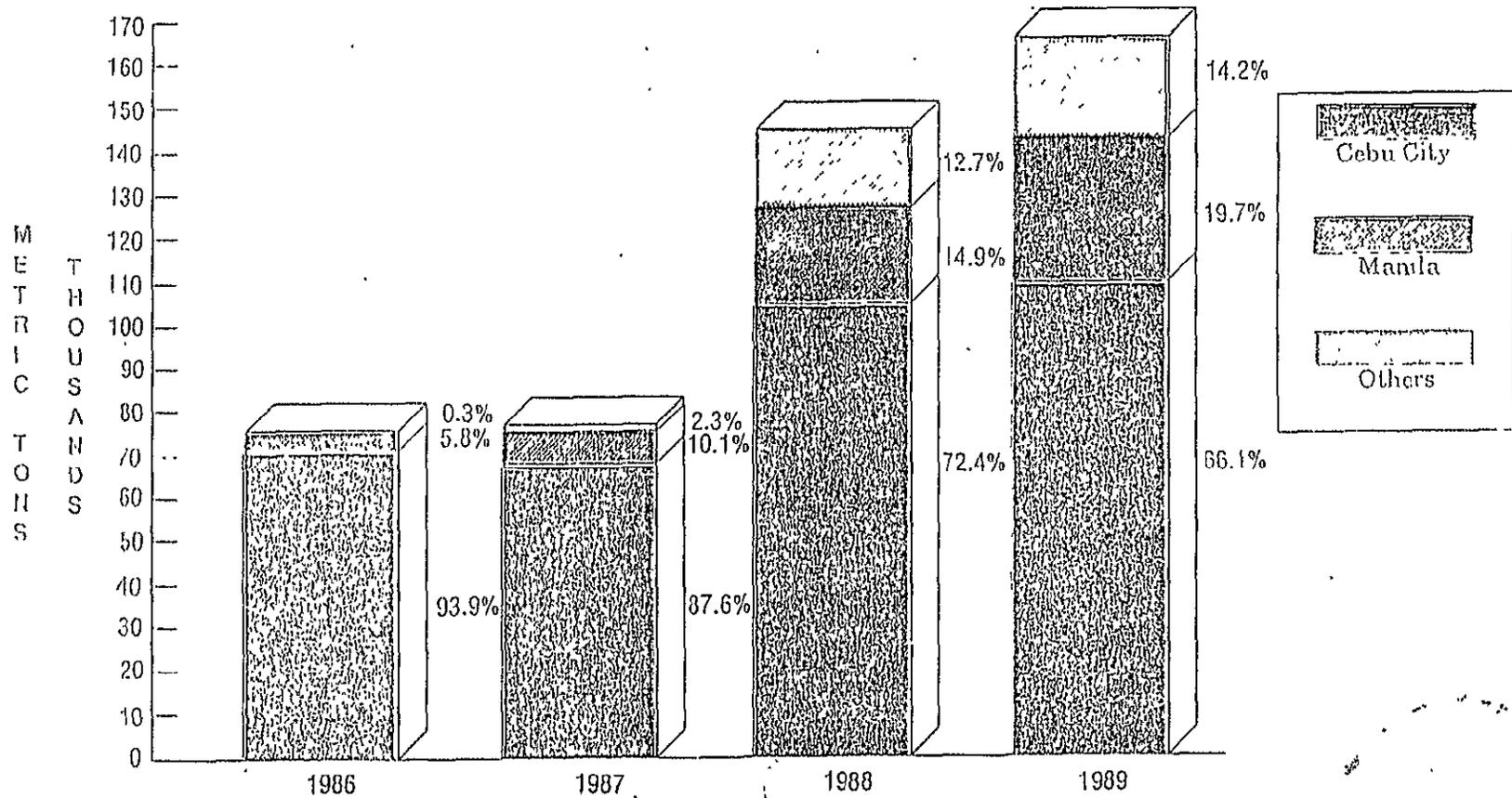


Legend:

- Yellow and White Corn Grain
- Corn Grits
- By-products ("tik-tik", corn bran & corn germ)

Source: Interviews of farmers, traders and corn millers

Figure 4.5 YEARLY OUTFLOW OF WHITE CORN GRAINS FROM CAGAYAN DE ORO CITY, 1986-1989

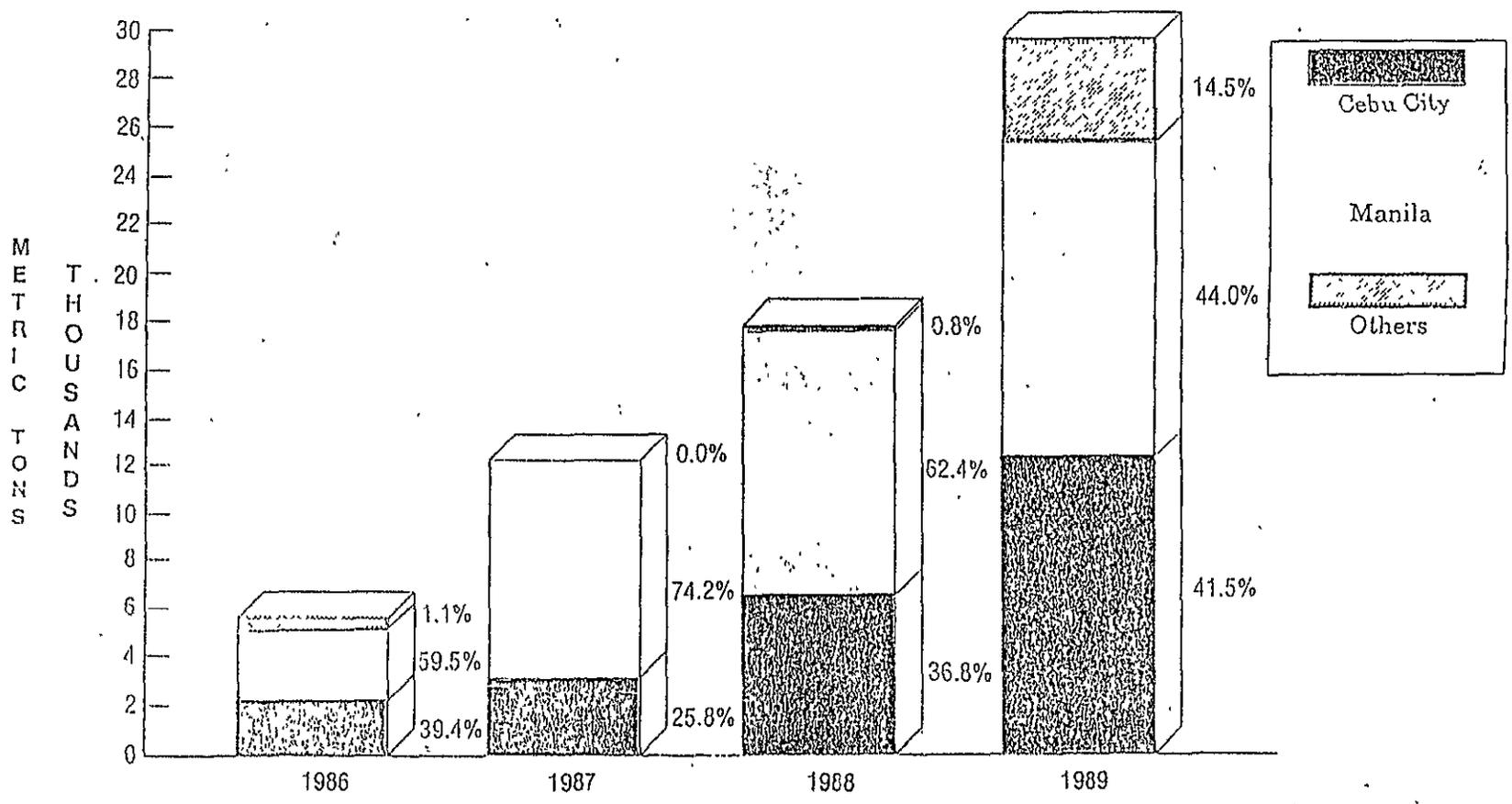


Source: National Food Authority, Region X

1/ A more detailed yearly and monthly volume of outflow from Cagayan de Oro to specific destinations are contained in Appendices 16 and 17.

BEST AVAILABLE

Figure 4.6 YEARLY OUTFLOW OF YELLOW CORNGRAINS FROM CAGAYAN DE ORO CITY, 1986-1989



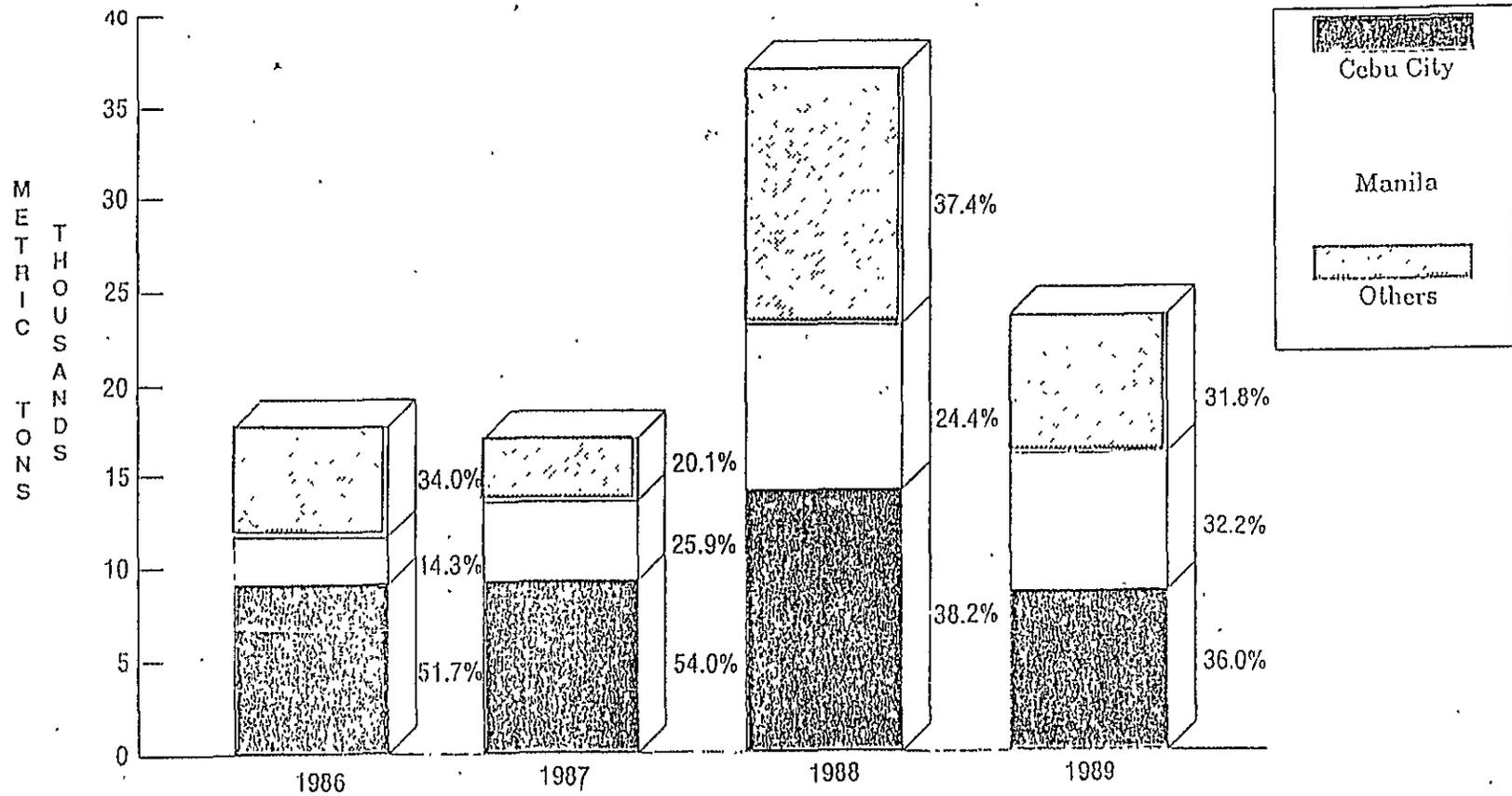
Source: National Food Authority

1/ A more detailed yearly and monthly volume of outflow from Cagayan de Oro to specific destinations are contained in Appendices 16 & 17.

BEST AVAILABLE

FOI

Figure 4.7 YEARLY OUTFLOW OF WHITE CORN GRITS FROM CAGAYAN DE ORO CITY, 1986-1989 ^{1/}



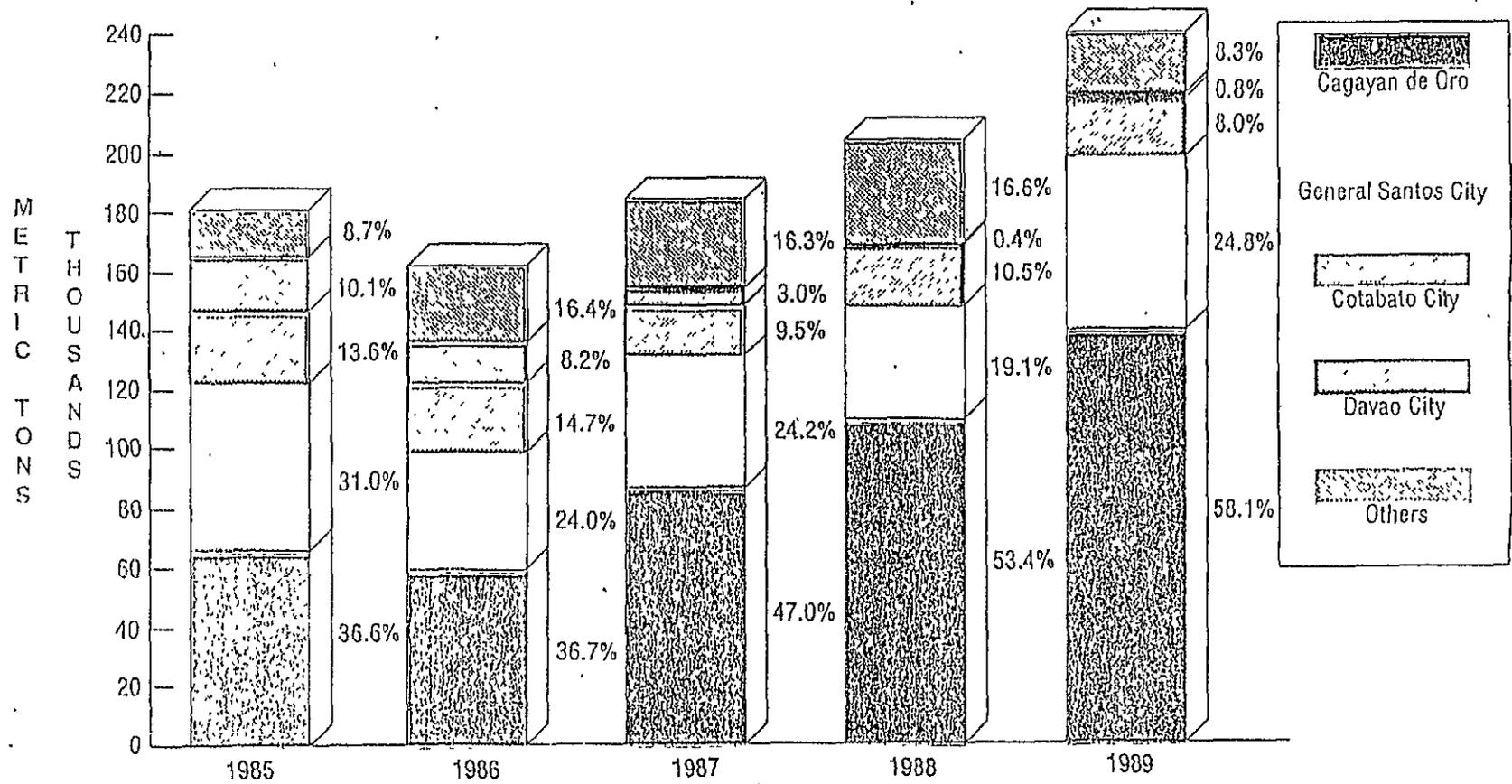
Source: National Food Authority, Region X

^{1/} A more detailed yearly and monthly volume of outflow from Cagayan de Oro to specific destinations are contained in Appendices 16 and 17.

BEST AVAILABLE

Figure 4.8 YEARLY INFLOW OF WHITE CORN GRAINS TO CEBU CITY, BY SOURCE, 1985-1989

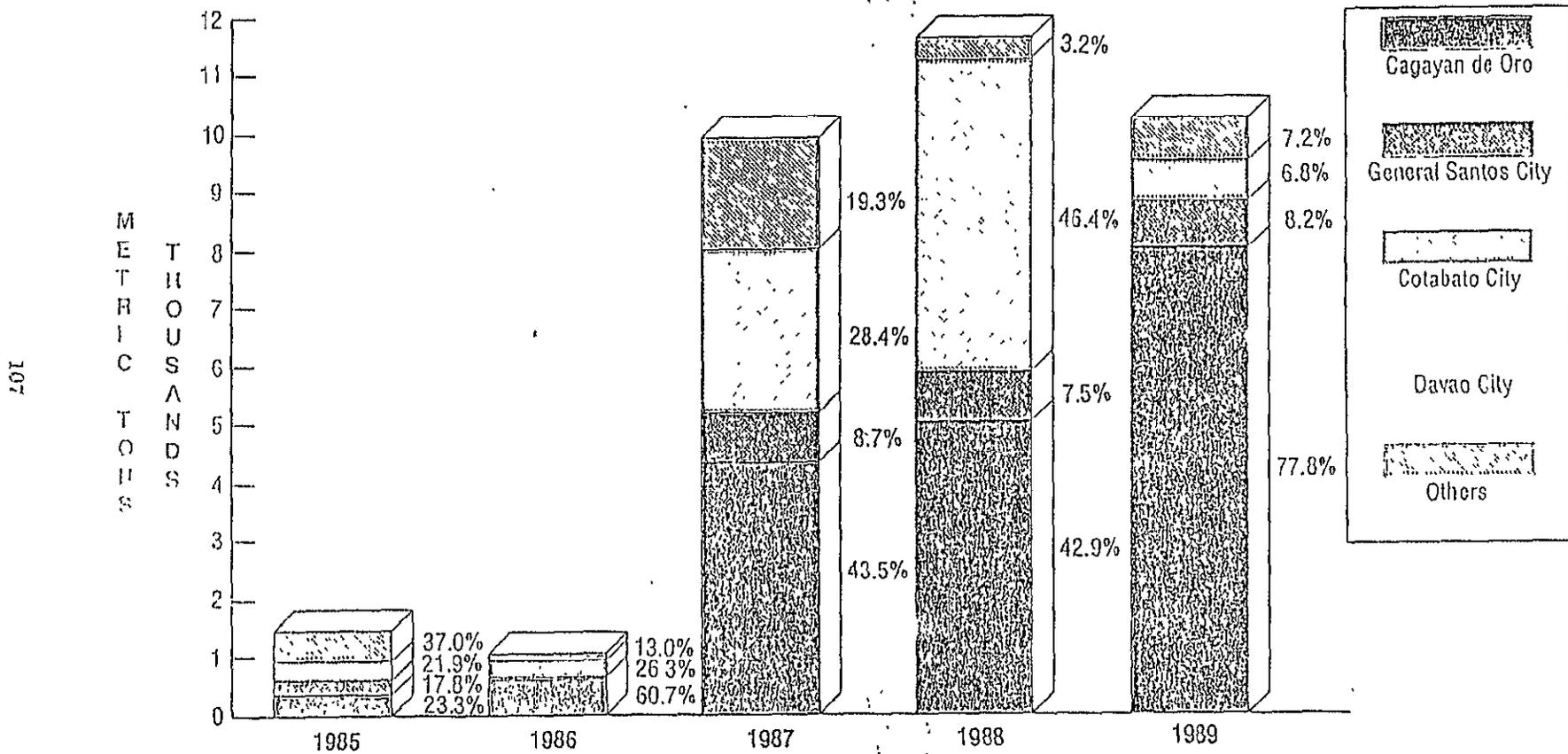
1/
 VAVI 1980
 EEB



Source: National Food Authority, Cebu City

1/ A more detailed yearly and monthly volume of inflow to Cebu City by specific sources are contained in Appendices 18 & 19.

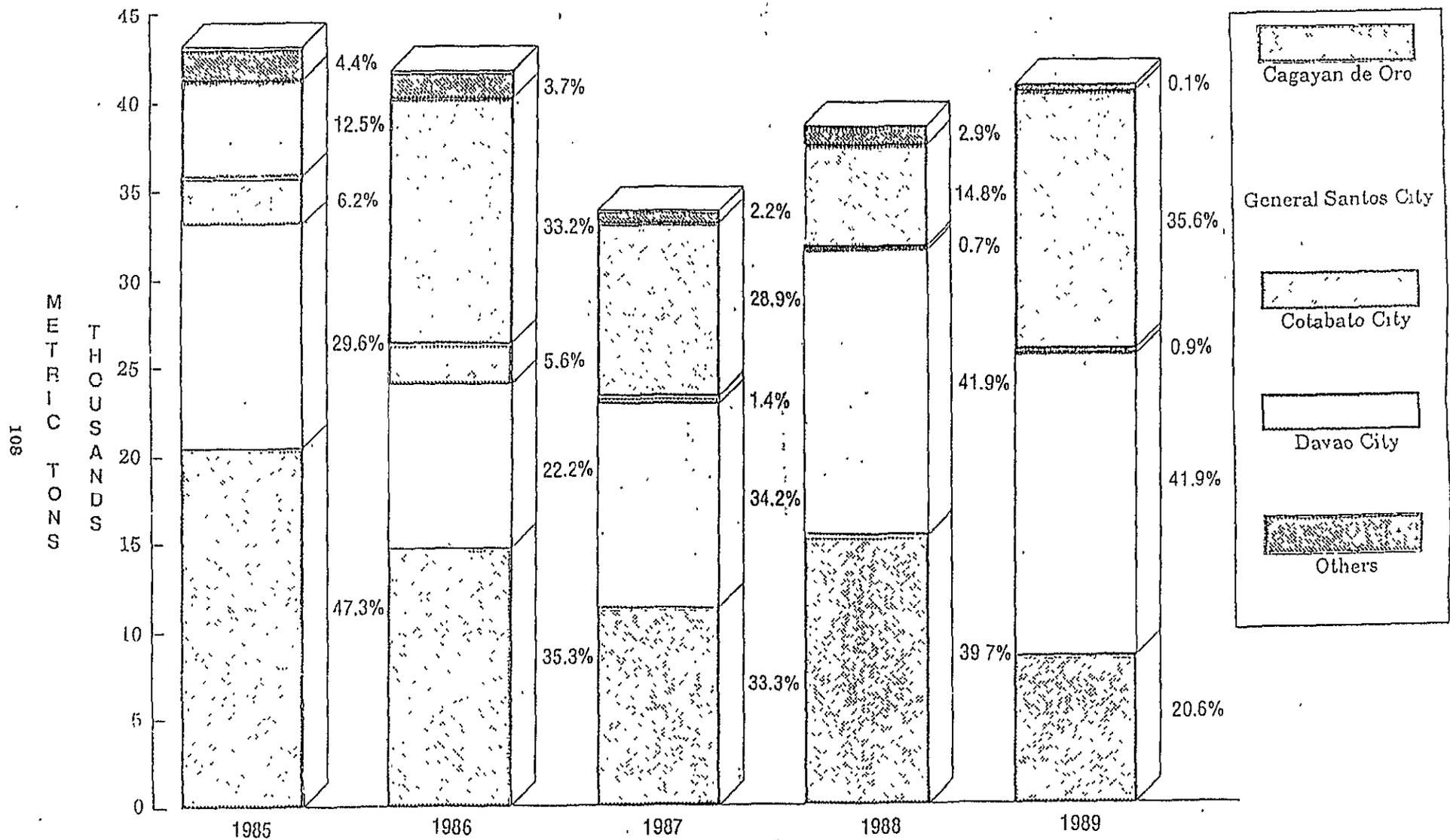
Figure 4.9 YEARLY INFLOW OF YELLOW CORN TO CEBU CITY, BY SOURCE, 1985-1989 ^{1/}



Source: National Food Authority, Cebu City

^{1/} A more detailed yearly and monthly volume of inflow to Cebu City by specific sources are contained in Appendices 18 & 19.

Figure 4.10 YEARLY INFLOW OF WHITE CORN GRITS TO CEBU CITY, BY SOURCE, 1985-1989



Source: National Food Authority, Cebu City

1/ A more detailed yearly and monthly volume of inflow to Cebu City by specific sources are contained in Appendices 18 and 19.

Over that period, Cebu mainly procured white corn and yellow corn grains from Cagayan de Oro, posting an average of about half of the total volume of inflow (46.3 percent for white corn and 49.6 percent for yellow corn). Relatively less dominant sources of white corn grains shipped to Cebu were General Santos City (in South Cotabato province, Region XI with an average share of 24.6 percent); Cotabato City (in Cotabato province, Region XII, with 11.2 percent); Davao City (in Davao province, Region XI with 4.5 percent) and other sources particularly Iligan, Ozamis and Zamboanga City (13.2 percent). Similarly, Cebu's other minor sources of yellow corn grains relative to Cagayan de Oro were Cotabato City (21.6 percent), General Santos City (8.4 percent), Davao (4.5 percent) and other provinces in the Mindanao and Visayas regions. In terms of white corn grits shipped to Cebu, about an equal share were contributed by Cagayan de Oro (an average of 35.2 percent), General Santos City (34.0 percent) and Davao City (25 percent) during the 1985-1989 period. Thus, among the major sources of corn, Cebu mainly procured corn grain and grits from Cagayan de Oro (with an average share of 43.7 percent to the total inflow of all types of corn during that 1985 to 1989 period), General Santos City, Cotabato City and Davao City contributed relatively lesser volumes of corn to Cebu (with a share of 22.3 percent, 11.9 percent and 11.3 percent, respectively). Appendix 18 shows the yearly inflow of white and yellow corn grains and grits to Cebu City from Cagayan de Oro City, General Santos City, Cotabato City, Davao City and others from 1985 to 1989. Appendix 19a - 19e shows the monthly inflow of white and yellow corn grains and grits to Cebu City from various points in Mindanao and Visayas from 1985 to 1989.

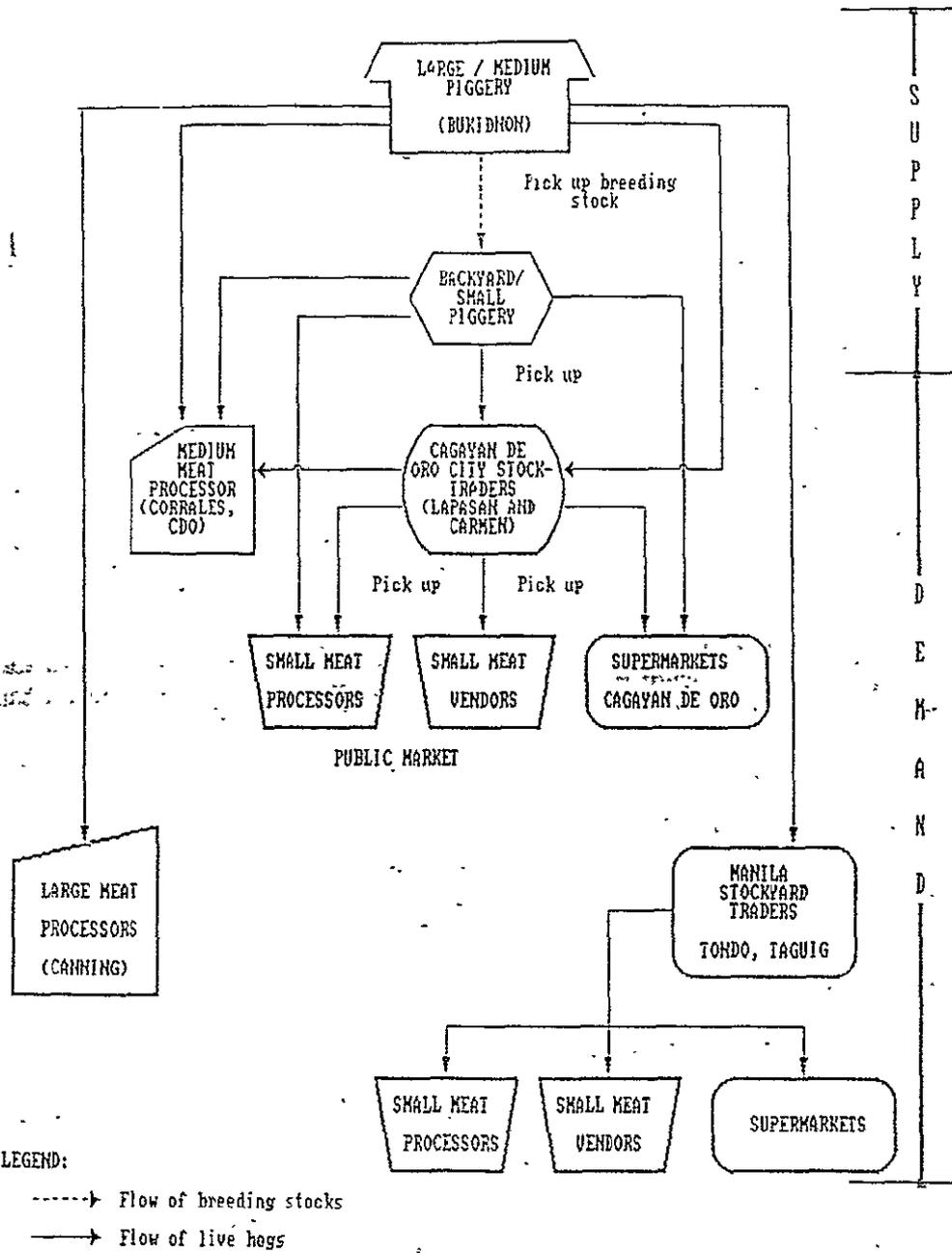
1.2. Out Flow of Commercial Hogs Commercial hog growers located at Bukidnon sold to market outlets in Malaybalay, Cagayan de Oro City and Manila. Most of the commercial hogs in Bukidnon were shipped to Manila through Cagayan de Oro port, with only a small percentage of hogs retained for the local market. Commercial hog growers nearer Cagayan de Oro directly shipped hogs to Manila and recently to Cebu and retained a small percentage for local/regional consumption. Most hogs shipped to Manila markets were sold either directly to large meat processors or through the stockyard traders with holding pens near the Manila port. These Manila buyers distributed or sold the live hogs to small meat processors and vendors and supermarkets within the area (Figure 4.11).

2. Trading Pattern

The trading pattern of corn within the region followed a hierarchical network of buyers and sellers. At the top of the hierarchy were the large buyers of corn at the demand center of Cagayan de Oro, i.e., the trader/shippers and processor/trader/shippers. They bought mainly from the second level participants in the "structure" composed of the municipal and provincial traders who were nearer the corn supply areas. The next level further down the hierarchy were the barangay traders who often served as "agents" for the municipal and provincial traders. The farmers composed the "lowest rung" in the hierarchy as the producers and the primary suppliers of corn. Within CDO, the canvassers served as brokers or "traffic directors" for truckloads of corn from several distant farmers, barangay traders and municipal traders, particularly from distant in the supply areas.

The hierarchy was supported by the existing "suki" arrangements among the participants which could either be a "credit-marketing tie-up relationship" or a "regular client" relationship. However, due to the decreased supply of corn within the region during the 1989 period and with the many large traders competing for corn supply, those at the upper level of the hierarchy could not just rely on these "suki" relationships, but also had to use more active "spot market" buying

Figure 4.11 Market Flow of Hogs from Bukidnon to Cagayan de Oro City and Manila



Source: Interviews from Bukidnon and Cagayan de Oro Hog Raisers and Assembly Center.

operations. The basic hierarchical structure has been eroding as more and more large farmers and municipal traders acted independently by transporting their corn to CDO for spot-market sales with the numerous trader/shippers. Several new trader/shippers were established in CDO since the port improvement opened more opportunities for shipment to Cebu. These entrants were vigorously competing on a spot market basis.

C. Market Entry and Competition

The degree and nature of market competition among the different types of participants are examined in terms of their market entry and competitive strategies employed.

1. Market Entry

Market entry affects the number and type of individuals/firms competing in the market. In the analysis on market entry, the different types of participants are categorized into those within the supply and demand areas.

1.1. Market Entry in the Supply Areas The year in which each corn-related business was established represents its market entry into the corn commodity system. The entry data type of system participants were arranged in five year periods. Overall patterns in Northern Mindanao indicated recent, vigorous entry by traders, hog and poultry raisers, and input dealers whereas corn millers have had few entries. For all forms of marketing participants interviewed in Cebu, recent entries were very few, indicating a much less vigorous industry. Each will be briefly examined below (Table 4.3a).

Commercial corn millers in the region began business as early as 1960's. They reached their peak in grits milling in 1978-80 before the drought of 1982-83. Over the past five years, no large scale commercial corn miller established business in Region X. This situation may be due to such factors as: a) the dwindling supply of white corn relative to yellow corn given the aggressive market strategies of hybrid seed companies; b) the tight competition for existing corn supply, especially from Cebu millers' buying stations in Cagayan de Oro; c) increased outflow of high quality grits from Davao; and d) decreased aggregate demand for grits. In fact, two large scale-commercial millers in Cagayan de Oro closed their business during this period. Commercial corn milling really appears to be a "sunset industry" from the CDO perspective.

Among trader/shippers, about half were "new entrants" to the market, indicating an increase in the number of large market competitors within Cagayan de Oro. However, most of these "new entrants" only operated in CDO and were not in integrated operations.

1.2. Market Entry at Cebu Demand Side. Among the sample large traders and corn millers in Cebu, there were no new large entrants in the corn business within the five years. Sample corn millers had started business in the 1960's while most of the large traders were established in the early 1980's to compete with older firms. Most of the commercial hog and poultry raisers had entered the market beginning in the 1970's (Table 4.3b).

Table 4.3a Market Entry of Marketing System Participants in Supply Area (Northern Mindanao)

ESTABLISHMENT PERIODS	TRADERS				CORN MILLERS			FEED-MILLERS	HOG & POULTRY RAISERS			INPUT DEALERS
	Burangay (N=25)	Municipal (N=44)	Prov'l. (N=8)	Trader/Shipper (N=6)	Custom (N=24)	Custom-Comm'l. (N=5)	Processor/Trader (N=5)		Hog Raisers (N=4)	Poultry Growers (N=7)	Hog & Poultry Raisers (N=3)	
	(%)											
1985-1989	84	52	50	50	17	40			83	43	34	42
1980-1984	4	7	12		17	20	20	100	17	43		42
1975-1979	8	16			21					14		12
1970-1974		11		17	4	40					33	
1960-1969	4	14	38	17	33		80				33	4
1950-1959					4							
No response				16	4							

1/ HOG RAISERS included only the medium to large commercial raisers; POULTRY RAISERS included all small, medium and large growers; and HOG AND POULTRY RAISERS were all large scale growers.

2/ Included mostly municipal retailers and few wholesaler-retailers who operated agricultural supply stores; private trader-financiers were excluded.

Source: Interviews with traders, corn millers, hog and poultry raisers, and input dealers in Region X.

Table 4.3b Market Entry of Marketing System Participants in the Demand Area (Cebu)

ESTABLISHMENT PERIODS	Trader/Shippers (N=4)	Commercial Corn Millers (N=7)	1/ Feedmillers (N=3)	Hog & Poultry Raisers 2/	
				Hog Raisers (N=5)	Hog & Poultry Raisers (N=5)
(%)					
1985-1989	25			20	
1980-1984	50	29		40	17
1975-1979		14		20	33
1970-1974					33
1960-1969	25	29			17
1950-1959		29			
No response			100	20	

1/ One commercial feedmiller is also a poultry raiser, an integrator, and an agricultural supply store owner.

2/ Hog raisers included both small backyard and medium to large commercial raisers; raisers of both hog and poultry were predominantly large in poultry and small in hogs.

Source: Interviews with traders, corn millers, and hog and poultry raisers in Cebu province.

2 Competition

The critical shortage of corn relative to the unusually strong demand in 1989 caused even greater competition among the system participants than in any recent first cropping season. This section identifies the methods/business strategies used by the participants to compete in the market, both in the supply and demand areas.

2.1. Supply Area Competition At the production level, the options open to a farmer on where and to whom to sell corn most profitably depended on such factors as distance to market, capability to hire trucks, number of accessible buyers and existence of a "suki" relationship with his buyer, i.e., a form of credit-marketing tie-up or only a "regular customer" relationship. Farmers without a financial tie to a trader chose whichever buyer offered the "best" price. Whereas some of those with a tie-up still "polevaulted", i.e., sold part of their harvest to other buyers.

Among the barangay traders, good rapport with their neighbor farmers was maintained by extending credit in terms of consumer goods withdrawn from their "sari-sari" store or inputs/cash. The degree of competition among these small traders was rather limited due to their relatively small buying operations. However, those acting as agents for larger buyers were quite competitive.

The municipal and provincial traders provided support services to farmers such as credit, drying floors and trucks for hire, as a form of non-price competition. Since all of them had trucks to haul corn to Cagayan de Oro the number and capacities of their vehicles determined their competitive advantage. The large trader could afford to offer better prices for both "dry" and "wet" corn in addition to support services. Some large traders even hired "agents" to accompany their trucks to the more interior barangays in search of corn.

The presence of new entrants in the CDO market, including buying stations for Cebu millers, created an extremely competitive situation for corn grain. To gain a better competitive position relative to their Cebu competitors, some of the Cagayan de Oro large traders and processors established their own formal "backward" integration to Bukidnon and/or "forward" integration to Cebu. Likewise, those who could get higher allocations for cargo space in vessels and/or could afford to charter tramp vessels to transport corn to other regions gained a strong competitive edge over competitors.

2.2. Demand Area Competition In Cebu, competition was tight due to the corn shortage and strong demand for corn starch and feeds. Recently, four Cebu-based corn millers decided to integrate their business backward to the supply areas, like Cagayan de Oro. Others have used a similar strategy in General Santos (South Cotabato). The traditional "suki" or regular trading relationships between millers and Cebu-based traders have noticeably declined.

Additional business strategies used by different types of Cebu buyers included: a) Cebu-based trader/shippers used strategies such as taking orders from buyers prior to corn shipment, offering terms of credit for several weeks after delivery, and free delivery of corn to particular buyers; and b) corn millers competed within their group by putting up retail stores for grits

near Cebu, delivering grits to wholesaler's place for free and special grits shipments to coincide with peak demand per Visayas city.

D. Product Differentiation

Corn grain as a commodity was usually distinguished by the buyer according to moisture content, i.e., "wet", "half-dry" and "dry". Brand names of grits and the sack weights used were also forms of product differentiation.

1. "Wet", "Half-dry" and "Dry Corn"

The moisture content of corn determined its grain quality, i.e., "wet" corn with a moisture content of 19% and above, and half-dry corn with an m.c. of 16%-18% were considered "poor quality corn", while dry corn with an m.c. of 14%-15% was branded as "good" corn. Corn millers, feedmillers and other users of corn in Cebu claimed that grains coming from Cagayan de Oro were of higher moisture content, i.e., "wet" or "half-dry" while those from Davao and South Cotabato were usually "dry".

The cause of high moisture content of Cagayan de Oro corn shipped to Cebu was attributed to heavy rainfall pattern and inadequate drying facilities at the production areas. Moreover, since demand for corn was usually high in Cebu and corn could be shipped each day to Cebu, these "wet" or "half-dry" corn could be immediately sold to the Cebu end-users. The more rapidly the trader bought and sold corn, the more profit he made. In addition, the volume of corn grain from General Santos and Davao to Cebu has recently been declining, thus opening more sales opportunities for CDO corn. Consequently, during a period of corn shortage, there was no incentive for the Cagayan de Oro suppliers to dry their corn.

Cebu corn millers offered a premium price of P 5.00 to P 10.00 per sack of 57 kg more for dry than wet or half-dry corn.

2. Brand Names of Grits

Corn grits were sold in the wholesale markets according to their own brands. Since the quality of grits varied by origin, brands helped consumers select the quality preferred and affordable. A Davao brand of grits, "Julu," was the most costly and highly recommended in Cebu during the period of the study. Example of brand names from Bukidnon were "GTCM" and a "rabbit symbol". Examples of brands sold in Cagayan de Oro were "Marca Leon" and "ATCO". In Cebu, a larger number of brands were available, such as "Seven Stars", "Corona", "Eagle" and "Mickey Mouse".

Marketing participants performing those functions relative to inputs for corn production as well as various forms of commodities are illustrated in Table 5.1. Traders, corn millers and hog and poultry raisers, especially those dealing directly with farmers, distributed various forms of inputs, such as seeds, fertilizers and pesticides. On the functions performed relative to commodities, traders, corn millers and hog and poultry raisers who had shellers usually bought corn on the cob from farmers as well as corn grain. However, once corn was exchanged between traders, it was seldom in the form of cobs, only grain.

1. Physical Functions

1.1. Harvesting Farmers in lower elevations harvested white and yellow corn early, usually 105-115 days after planting, in order to: a) reduce risks due to bad weather; b) prevent growth of fungi or control insect damage; c) avoid loss of seeds; and e) prepare the land immediately for the second cropping season. In higher elevations, another 10-15 days were required for full harvest maturity. Small farmers mostly relied on family labor and relatives to harvest their fields. In several locations, relatives were invited to Bukidnon from the Visayan regions. Large farmers, especially those who planted yellow hybrid, hired laborers or harvesters.

a. Hired Harvesters Harvesters used a bamboo stick or a knife to help dehusk the ears of corn as they picked each row of corn. After filling their sacks of cobs, they hauled them to the place where sharing or payment was made by the farmer-employer. Before sharing, harvesters sorted out damaged or fungus-infected corn to stop contamination which caused spoiled corn. Ten to twelve persons were normally required to harvest one hectare of corn within a day.

b. Sharing or Payment System Sharing was either in cash or in kind as measured by cobs of corn. Yellow corn farmers usually practiced payment of harvesters on cash basis, locally termed as "lucát system". The fixed amount for corn harvested was determined by weighing or using a can, whichever was convenient. The amount of "lucát" varied from P 0.10 per kilogram, P 1.00 per can or P 3.50 per sack. Thus, a harvester was paid P 50 for 500 kgs of harvested corn. The "lucát system" enabled farmers to acquire all the harvested corn by paying laborers in cash.

Most white corn farmers, especially in the interior barangays used the payment-in-crop sharing system. Cans were used as units of measure for this system of sharing. The ratio was based on the farmer's assessment of his raw material costs. For instance, white corn farmers who did not apply fertilizers paid harvesters on a sharing ratio of 6:1, i.e., 6 cans to the farmer and one to the harvester. The usual sharing ratio for white corn was 7:1 or 9:1 since most farmers used some fertilizers. Yellow corn farmers whose raw product costs were higher, paid less to the harvester, i.e., their sharing ratio was from 10:1 to 11:1. However, larger yields and close spacing of plants could mean a larger amount of corn earned by the harvester per period of time.

Various strategies were used by farmers to ensure they had adequate harvesters during this peak harvest season when laborers were scarce. Laborers hired to plant the farmer's corn were promised a harvester's job. Some hired planters of yellow corn agreed to wait for their payment till after they had helped with the harvest in order to receive a larger share of 6:1 or 7:1 instead of the usual 10:1 or 11:1 ratio. Another approach was to immediately pay hired planters then request them to join the harvest at a slightly higher harvester's share. Some farmers sent invitations to relatives to help during the harvest season.

Table 5.1 Marketing Functions Performed by Marketing Participants in the Supply and Demand Areas

MARKETING FUNCTIONS	TYPES OF TRADERS					CORN MILLERS	FEED MILLERS	HOG and POULTRY RAISERS 1/	FOOD MANUFACTURING 2/
	FARMERS	BARANGAY	MUNICIPAL	PROVINCIAL	TRADER-SHIPPER				
PHYSICAL FUNCTIONS :									
Harvesting	C	C	C	C	C	C			
Shelling	C	C	C	C	C	C			
Drying	C/G	G	G	G	G	C/G		G	
Sorting	C/G	C/G	C/G	C/G	G	C/G/GT	G/F	G/F	
Hauling		C/G	C/G	C/G	G	C/G/GT	F	H/B/G/FPB	
Shipping					G	G/GT	F	H/PP/PB	CO/SF/ST
Cleaning						G	G		G
Processing/Manufacturing						GT	F		ST/SF/CO
Construing						G	CBP/G	G/F/CBP	CBP
EXCHANGE FUNCTIONS :									
Buying		C/G	C/G	C/G	G	C/G	G/CBP	G/F	CBP
Selling	C/G	C/G	G	G	G	C/G/GT/CPB	F	H/PP/PB	ST/CO/SF
Assembling		C/G	C/G	C/G	G	C/G/GT	G	C/G	
Distributing Inputs		FT/S	FT/S/CH	FT/S/CH		FT/S/CH	FT/S/CH	FT/S/CH	
FACILITATING FUNCTION									
Financing		FT/S/CA	FT/S/CH/CA	FT/S/CH/CA	FT/S/CH/C	FT/S/CH/CA	FT/S/CH/C		FT/S/CH
Risk-bearing 3/		/	/	/	/	/	/	/	/
COORDINATING FUNCTION									
Grading 4/						GT	F	PP	S/SF
Informing 5/		/	/	/	/	/	/	/	/
Contracting 6/									

1/ One large hog and poultry raiser in Cebu was integrated into meat processing, i.e., pork meat.
 2/ Manufacturers of corn starch, corn oil and snacks foods.
 3/ Reflects risks of non-recovery of credit, unanticipated drop in selling price, spoilage while owned, and the like.
 4/ Corn is given value according to level of moisture content, (i.e., wet, half-dry and dry) but no actual grading is done.
 Corn grits, however, are graded, e.g., no. 10, 12, etc. according to the fineness of the grits.
 5/ Municipal and Provincial traders use VHF radio to keep posted on prices.
 6/ Entering into a formal agreement on buying/supplying particular products either in verbal or written form.

Legend:

- | | | | |
|------------------|-----------------|---|------------------|
| C - Cobs | CA - Cash | P - Poultry | SF - Snack Foods |
| G - Grains | GT - Corn Grits | H - Hogs | CO - Corn Oil |
| FT - Fertilizers | F - Feeds | PP - Poultry products | ST - Starch |
| S - Seeds | | CBP - Corn by-product | / - Yes |
| CH - Chemicals | | B - Broilers | |
| | | PB - Poultry by-product
(Chicken dung) | |

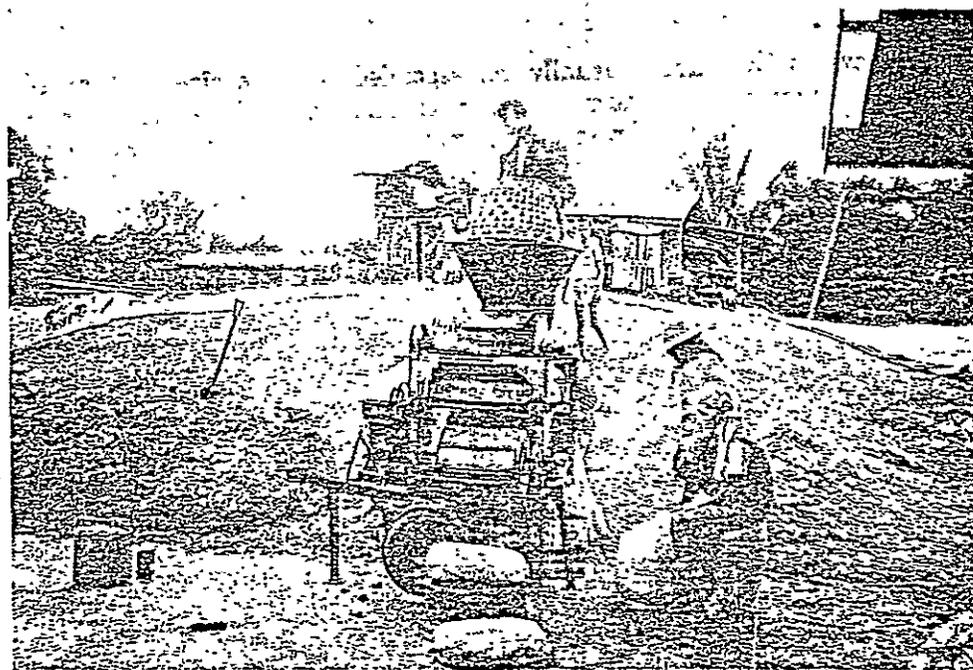
Source: Interviews

1.2. Shelling Corn shelling was performed either by hand or machine depending on the volume of corn handled and availability of a shelling machine.

a. Manual Shelling Farmers who sold in small volumes or were located in interior areas where shelling machines were not readily available usually shelled manually. One method involved fingers dislodging the kernels. Moreover, manual shelling usually involved the use of a "bangguran", a wooden block with parallel tin strips inserted in the wood (something like a cheese grater) so as to loosen corn kernels. However, as this method was time consuming, shelling was done in small batches only. White corn farmers shelling corn for home use or small barangay traders handling smaller quantities were most likely to use manual shelling.

b. Mechanical Shelling Roadside farmers nearer the market and those handling large volumes used mechanical shellers. Hand operated shelling machines handled small to moderate volumes. Large farmers such as those who planted yellow corn used either the stationary or mobile shellers.

Mobile or "traveling" shellers such as those found in Malaybalay and Claveria, were more convenient, economical and more affordable particularly for large farmers. Farmers with a couple of laborers operated the machines by themselves. Mobile shellers were taken to the fields, thus saving costs for transporting bulky cobs of corn. The empty cobs were left near the field for use as fuel and/or organic fertilizer.



The "travelling" sheller saves costs for transporting bulky cobs of corn.

Stationary shellers were fixed inside a bodega and were costly to own. Their larger capacities required a team of supervised laborers to operate. Appendix 20a - 20b shows the capacities of some stationary shellers found in the sample municipalities. Thus, medium to large traders were mostly likely to own them as a way to buy more corn (in cobs) from farmers. Municipal and provincial traders charged a shelling fee of P 0.04 to P 0.14 per kilo of corn depending on their

location and the supply of shellers in that area. All commercial and some custom millers within the production areas of Bukidnon and Misamis Oriental also owned stationary shellers in order to buy large volumes of corn for milling. Only a few Cagayan de Oro traders and processors shelled corn because most of them bought corn grains.

Fabricators of Mechanical Shellers Private entrepreneurs manufactured mechanical shellers within Bukidnon. The pioneer fabricator was based in Maramag while new firms were established in Don Carlos and Kalilangan. Old shellers brought in from Davao, Cagayan de Oro or as far as South Cotabato, were repaired and/or improved upon by small repair shops throughout the province. Sheller operators contended that the demand for shellers have been strong but high acquisition costs and transportation problems have dampened the response to that demand.

1.3. Drying Solar drying was the least expensive and most popular method for drying corn. Several technologies or types of solar dryers were found in the region. The most common was the multipurpose (basketball court-dance floor-grain drying floor) dryer found on public land near the center of the barangay. This public drying facility was managed by barangay officials who charged minimum amounts for its use by local farmers. However, the capacity was limited to 100 bags or less per drying period which varied from hours to days depending on the weather.

For household drying purposes, farmers used mats or "amakan", nets and empty sacks. If the home was situated near an asphalt or concrete road, that pavement became a favorite drying floor for commercial and household grain.

Drying floors owned by traders usually corresponded to the size of that trader's business. Thus, municipal and provincial traders and/or commercial millers had larger drying floors than barangay traders (Appendix 21). Grain drying methods ranged from laborers using hand tools to the use of small Kubota tractors to spread and rake the grains as they dried and then tractor-driven front-end loaders scraped up and piled the dried corn. This range in methods not only depended on the size of the drying floor but likewise on the owner's and user's preferences. For instance, one large corn trader/miller used farm labor on his big drying floor to provide employment for his "suki" farmers. Conversely, another large trader/landowner fully mechanized his large drying floor due to labor problems in his area and the urgent need to rapidly shell and dry corn before the afternoon rains came. Most large trader/shippers and corn millers in CDO also had large drying floors, except those who recently began buying from a bodega.

Several types of non-solar dryers or mechanical dryers were found throughout Region X. The two main types were the small scale dryer (originally designed for drying "seed quality grain") and the large scale commercial dryer. Of the imported types, a few have been redesigned with burners fueled by local materials such as corn cobs or wood while others were petrol-fired. All used electric engines for moving the grain. Vertical box or silo types were more common than flat bed types. However, except for unusual situations, most mechanical dryers were not regularly used during this first cropping season of 1989. Further details on the characteristics of the various types of mechanical dryers found throughout Region X are presented in Chapter VII under "Infrastructure".



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A payloader is used to put the corn cobs in a large sheller attached to a "box-type" of mechanical dryer.

Determining Moisture Content Farmers and some traders usually tested the moisture content of corn by: 1) the "feel" method by either stirring the grains by hand or pressing the "eye" of the corn grain; or 2) the "sound" method where they either throw a few grains onto the concrete and listen to the impact, or bite them to find out if they have cracking sound that indicates dryness. Large traders usually owned moisture meters which they sometimes lent to local "suki" farmers.

"Wet" Corn For all types of participants, the inadequate number of solar dryers posed a serious problem especially during the first cropping season when harvests occurred during the rainy months from July to September. Yellow corn farmers who had higher volumes to sell were more affected by the lack of dryers and high moisture content corn compared to white corn farmers who had lesser yields and kept a part of their harvest for food. Estimates of gross losses potentially incurred by farmers who sold corn in varying degrees of wetness are noted in Tab 5.2. However, these computations relate to a normal peak season in which discounts for high moisture content are actually applied and conditioned on the availability of barangay dryers for farmer's use.

1.4. Transporting Transport from the farm to the traders' place depended on location, type of road and volume handled. Farmers in the interior barangays usually used animal-drawn sleds or carts while large farmers near the roadside used trucks or trailers. Farmers financed by traders had access to the hauling services of the financiers. Large farmers could afford to hire trucks. Details on the road transport system in the region as they affect corn marketing are discussed in Chapter VII under "Infrastructure".

Table 5.2 Farmers' Potential Loss per Bag of Grain due to Selling Semi-Wet or Wet Corn in Different Locations, First Cropping Season, 1/ 1989

LOCATION	CORN CLASSIFICATION : BY MOISTURE CONTENT 2/	RANGE OF WEIGHT : DEDUCTION/BAG : ("RESECO") : BY TRADERS 3/	GROSS VALUE : AFTER DEDUCTION:	ESTIMATED FARMERS' LOSS : DUE TO "RESECO"
		(%)	(P/BAG)	(P/BAG)
CAGAYAN DE ORO	Wet	5-7	239.40-234.36	12.60-17.64
CLAVERIA	Wet	5-10	239.40-226.80	12.60-25.20
MALAYBALAY	Wet	4-5	241.92-239.40	10.08-12.60
VALENCIA	Wet	10-20	226.80-201.60	25.20-50.40
MARAMAG	Wet	5-15	239.40-214.20	12.60-37.80
DON CARLOS	Semi-dry Wet	6 8	236.88 231.84	15.12 20.16
KALILANGAN	Semi-dry Wet	7-10 20	234.36-226.80 201.60	17.64-25.20 50.40
WAO	Semi-dry Wet	5 25	239.40 189.00	12.60 63.00

1/ The method for computing the loss was the difference between earnings for a 60 kg bag of dry corn (14-15% moisture content) and deductions due to excess moisture content. The August, 1989 price of P=4.20/kg was the basis for comparison. Discounting rates varied by location.

2/ Classification by moisture content was dry = 14-15%, semi-dry = 16-18% and wet = 19% or above.

3/ Five of the sample traders in CDO are trader-shippers while the rest are municipal and provincial traders.

Source: Trader Interviews

1.5. Storing Farmers stored a part of their corn mainly for use as food, seeds and feeds. During the first cropping harvest of 1989, most of the farmers sold their corn because of the unusually high prices offered for the commodity. Sample yellow corn farmers stored a negligible amount (i.e., 0.7%), while white corn farmers stored for their food a relatively larger share of their harvests (i.e., 12%).

Generally, commercial storage was determined not as much by the firm's volume of operations but more by the level of working capital of the business and the prospect of higher prices. Thus, only the large traders/processors invested in large warehouses. Storage periods for the large traders in Cagayan de Oro and Cebu varied from two to five months. However, with the scarcity of corn and the unusually high prices during the first cropping season of 1989, Cagayan de Oro and Cebu traders and processors did not store much corn but briskly sold their stocks.

1.6. Processing The five types of participants who processed corn were the corn millers, feedmillers, medium to large scale hog and poultry raisers, and starch and corn oil manufacturers. The research focused more on the operation for corn milling and hog raising due to the significant number of these processors who were active within Northern Mindanao and Cebu. Hog raising is treated as a special case study in Chapter X because of its more complex operations.



Large trader/processor store commercial quantities of corn grains in anticipation of higher prices.

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For processing white corn grain into higher-value grits for food use, the grain passed through a corn peeler or germinator to separate the corn germ and the corn hull from the grain. These ground parts of the grain passed through screens according to the fineness of the grits. All grades of grits then passed through a blower to remove any remaining bran.

Corn millers highly preferred milling dry corn grains with a moisture content of 14% because of higher milling recovery of about 60% to 62% and the longer shelf life of grits.

In general, corn grains coming from Region X have an unfavorable quality reputation in the Cebu demand area for being wet or half-dry (i.e., with a moisture content of 18-19%).

Cebu millers usually mixed wet or half-dry corn grain from Cagayan de Oro with the well dried corn grain from General Santos or Davao prior to milling. The rates for mixing wet corn to dry corn varied by the availability of dry corn. The premium price that Cebu millers were willing to pay for General Santos' dry corn was between P 0.12/kg to P 0.13/kg.

a. Comparison of Corn Milling in Cebu and Cagayan de Oro The basic milling technology in Cebu and Cagayan de Oro over the past decades have remained the same. The design of the mills were duplicated from its Cebu origin. Changes in construction materials and increased automation marked the newer units from the old. Milling capacity was expanded by the installation of additional milling units, not changing the design, except perhaps for one specially designed mill in Cagayan de Oro.

Differences between Cagayan de Oro and Cebu corn milling operations included inventories maintained, capital exposure, facilities and labor force and nature of the business. The Cagayan de Oro miller usually carried grain inventories for a couple of months because of combined trading and milling businesses. Conversely, the Cebu-based miller only kept a couple of weeks to one month inventory of grain. Another major difference was the nature of businesses and layout/size of facilities. The Cebu miller was more specialized in milling and grits distribution with few employees, a fairly large warehouse and milling building, a small office and very little land area. The commercial corn miller in Cagayan de Oro and Bukidnon were usually diversified into corn-related businesses with many employees, large warehouses/milling buildings, a medium sized office, vast cemented drying floor (and/or a mechanical dryer), a fleet of trucks for both long and short distance hauls, and other equipment for trading or processing of various agricultural products.

2. Exchange Functions - "Buying and Selling"

The nature of the "buying and selling" functions are reflected by the significant patterns within the corn marketing system environment. The study captured the following patterns in the "buying and selling" within the corn commodity system extending to Cebu.

2.1. Abnormal Price Behavior in Peak Harvest Season, 1989 Market behavior normally corresponds to two types of market conditions, namely as "buyers market", i.e., corn surplus season when buyers lowered their "bid" prices to clear the market of excess corn versus "sellers market", i.e., corn-scarce season when sellers increased their offer price or searched for the highest bidder. However, during the July-August, 1989 peak harvest period, the normal "buyers market" also performed as a "sellers market". Prices did not drop as large volumes of corn were shipped out of the supply areas but continuously increased with the corresponding brisk trading in corn.

2.2. High Degree of Competition The multiplicity of the types of buyers and immediate end-users of corn as well as diverse sales incentives called for a more dynamic approach to marketing. This involved such practices as establishing either a "backward" or "forward" integration

to boost sales, or providing incentives to suppliers and buyers in the form of access to credit, transport and post-harvest facilities. The remarkably high prices of corn during the peak harvest of the 1989 first cropping season exacerbated the already tight competition among the many buyers and end-users.

2.3. Search for Bid and Offer Prices The role of canvassers in corn trading has recently become more prominent due to the distance, road conditions from interior supply areas and increased number of independent traders in both the supply areas and CDO. Consequently, sellers and buyers needed the services of well-connected and strategically located persons for finding the best "bid" price and receptive "offerers" at the quickest time possible.

B. Support Services

Market information and credit are the two types of support services that reflect facilitating and coordinating functions and are important in the corn system operations.

1. Market Information

Market information involves the collection, interpretation and use of relevant data such as prices, demand-supply situation and technology.

1.1. Price Information Sixty-seven percent of the sample farmers stated that traders were their major sources of price information (Table 5.3). The next most frequently mentioned sources of price data by farmers were co-farmers, friends, neighbors (31%) and canvassers (23%). Radio broadcasts played a minor role in disseminating price statistics to farmers (7%). The strong dependence of farmers on the traders for price information partly reflected the "suki" system, meaning regular client relationships and the credit-marketing tie-up between farmers and traders.

Barangay traders sourced price information from the municipal or provincial traders (some of whom posted prices on bulletin boards) and from drivers of jeepneys and trucks (Table 5.4a). Municipal and provincial traders usually owned telephones and/or radio transceivers with which they made daily calls to canvassers and agents in CDO. Often they instructed their truck drivers delivering corn to Cagayan de Oro to monitor the prices there. CDO canvassers or agents were especially important to municipal and provincial traders located in the far flung municipalities of Bukidnon, like Don Carlos and Kalilangan, and Wao in Lanao del Sur. The "suki" and credit-marketing tie-up accounted for much of the smaller trader's reliance on the large trader's information.

Cagayan de Oro City traders and processors obtained price information from the Cebu and Manila buyers through telephone and telex. Those who had established office/buying stations, or who had sales agents and relatives either at the supply or demand sites had a strong advantage in obtaining fast and reliable price information (Table 5.4b).

1.2. Demand-Supply Situation and Importation Data Large traders and processors telephoned or met key informants regarding market information such as current volume of

Table 5.3 Sources of Price Information for Sample Farmers by Location First Cropping Season, 1989

SOURCES OF PRICE INFORMATION	CLAVERIA		MALAYBALAY		DON CARLOS		KALILANGAN		WAO		TOTAL
	1/ : Hinaplanañ (n=10)	2/ : Ane-i (n=10)	2/ : Magsaysay (n=13)	3/ : Aglayan (n=14)	3/ : New Visayas (n=14)	3/ : Pualas (n=14)	3/ : Kibaning (n=10)	3/ : Lampanusan (n=10)	3/ : Milaya (n=10)	3/ : Katutungan (n=10)	(N=116)
	(%)										
Traders	80	80	62	50	71	64	70	60	90	90	67
Co-Farmer / Friends, Neighbors	20		46	29	21	29	10	60	70	50	31
Agents / Canvassers			15	29	7	7	20	50	40	50	23
Local / Town Market		20	8	14	14	50	20	10	10	20	14
Radio Broadcasts			8	29		21					7
Farmer Organization / Cooperative		10									1
No Response		10					20	10			4

1/ Totals do not always equal 100% due to multiple responses.

2/ Of the two barangays sampled per municipality, the first barangay cited (e.g., Hinaplanañ) is an interior barangay while the second (e.g., Ane-i) is a roadside or more accessible barangay.

Source: Farmer Interviews

Table 5.4a Sources of Price Information for Sample Traders
by Type and Location, First Cropping Season, 1989

SOURCES OF PRICE INFORMATION BY LEVEL / TYPE	TRADERS BY TYPE				TRADERS BY LOCATION	
	Barangay (n=25)	Municipal (n=36)	Provincial (n=7)	Claveria (n=9)	Malaybalay, Maramag, Don Carlos, Valencia (n=37)	Pangantucan, Kablangan, Wao (n=22)
A Regional Level						
CDO: 1. Traders	8	69	43	55	49	45
2. Canvassers		22	29		22	18
3. Family Kin		3				5
B Municipal Level						
1. Traders	60	17		33	40	14
2. Jeepney Drivers/ Truckers from CDO	28	23	43		3	36
C. Barangay Level						
1. Traders	4					5
2. Jeepney/Motorela Drivers	4				3	
D. No Response	4	3		11		5

1/ Totals do not always equal to 100% due to multiple responses.

Source: Trader Interviews

Table 5.4b Sources of Price Information of Sample Traders in Cagayan de Oro, by Type, First Cropping Season, 1989

SOURCES OF PRICE INFORMATION ^{1/1}	TRADER/SHIPPER (n=8)	PROCESSOR/ TRADER/SHIPPER (n=3)
	----- (%) -----	
A. Inter-regional Level		
1. Cebu Millers	12	
2. Cebu Traders	25	
3. Manila Traders	12	
4. Family Kin (Manila)	25	
5. Branch Office (Cebu/Manila)	12	
6. Integrators (Manila)	12	
B. Regional		
1. Canvassers	25	67
2. Traders	25	100
C. No Response	12	

1/ Totals do not always equal to 100% due to multiple responses.

Source : Trader Interviews

production, demand requirements, supply estimates and import allocations. The Integrators in Manila established their own information network to check the validity of that market information. For instance, some of those firms fielded reconnaissance teams to estimate production prior to the harvests.

1.3. Technology Information Information on new production technologies came from agricultural extension services through the Agricultural Production Technicians (APTs) of the Department of Agriculture, the hybrid seed companies, active cooperatives (e.g., SIMCA in Ane-i, Claveria) and the non-government organization (NGOs), (e.g., Tawili Foundation in Wao). Post-harvest technologies such as comparative brands and advantages of different models of shellers and engines came from distributors as well as the fabricator/ manufacturers. Information on the different types of mechanical dryers and their economies were not readily available to the large traders and processors.

2. Credit

The facilitating function of financing is provided by informal and formal sources.

2.1. Informal Sources A majority (68 percent) of the farmers interviewed availed of credit from informal sources who were mostly traders. Eighty-two percent of the farmers located in the roadside barangays availed of production loans while only 54 percent of the farmers located in the interior barangays did so. Yellow corn farmers who acquired loans mostly from traders outnumbered the white corn farmers (60 percent and 40 percent, respectively).

Most credit was received in the form of farm inputs, not cash. The terms of repayment and interest rates for the credit differed by location and type of farmers, as shown in Table 5.5. Yellow corn farmers who availed of credit used them for seeds and fertilizers. Only a few white corn farmers acquired credit for seeds while most did so for fertilizers.

Majority of farmer-borrowers in the roadside barangays paid their loans in cash (73 percent) than on a charge-to-crop basis (24 percent). In the interior barangays, farmers who paid on a charge-to-crop basis slightly outnumbered those who paid in cash (52 percent and 44 percent, respectively). The interest rates for the seeds and fertilizers loaned among the sample farmers ranged from 2% to 10% per month which varied among the different locations. The credit period covered 4 months or one cropping season.

The more personalized type of "suki" arrangement involving credit-marketing tie-up predominantly portrayed farmer-trader relationships. The farmer, by depending on the trader for capital, exchanged his price-bargaining position in favor of sharing the production risk with his financier. The trader, in turn, financed the farmer and was willing to share production risks in order to have a "captive share" of the harvests. In recent years though, traders have been more cautious and selective in choosing farmer-borrowers. Some traders employed agents to do credit checks on farmers and to help in loan collection. A few large traders with huge credit exposures to farmers reduced the risks of crop failure due to agro-climatic factors by securing the farmers' loans with crop insurance.

Table 5.5 Terms of Credit for Sample Farmers Growing Hybrid Yellow vs. White Corn Varieties by Location, First Cropping Season, 1989

MUNICIPALITY/ Barangays 1/	Sample Farmer with Credit 2/ From Various Sources	Types of Farmer by Variety Planted		TERMS OF CREDIT FROM INFORMAL SOURCES					
		YC	WC	Interest Rate/Month 3/				Mode of Repayment:	
				SEEDS YC WC	FERTILIZERS YC WC	Cash	Charge to Crop		
(%)									
CLAVERIA									
Hinaplanan n=10	80	43	57	3		4		72	28
Ane-i n=10	70 4/	57	43				6	72	28
MALAYBALAY									
Magsaysay n=13	40	25	75	8-10			5	25	75
Agalayan n=14	100	71	29			8	4	57	43
DON CARLOS									
New Visayas n=14	40	50	50						100
Pualas n=14	90	56	44	4	8	4-6	4-8	57	29 5/
KALILANGAN									
Kibaning n=10	50	60	40	4		4-8	8	40	40 6/
Lampanusan n=10	100	70	30	3-4	3-4	3-4	3-4	100	
WAO									
Milaya n=10	60	83	17					83	17
Katutungan n=10	50	80	20		3	2-3	9	80	20
AVERAGE N=115	68	60	40	5	5	5	6	59	38
SUMMARY BY BARANGAYS									
Interior n=57	54	52	48	3-10		4-8	4-8	44	52
Roadside n=58	82	67	33	3-4	3-8	2-8	3-9	73	24
AVERAGE N=115	68	60	40	5	5	5	6	59	38

1/ Of the two barangays sampled per municipality, the first barangay cited is an interior barangay while the second is a roadside or more accessible barangay.

2/ The dominant source of credit were informal and usually in terms of inputs. Exceptions included the cash received by three farmers in Agalayan and 1 farmer in Katutungan who availed of a formal loan.

3/ Credit covers four months or one cropping season.

4/ Four farmers in Ane-i borrowed from Claveria Rural Bank through Samahang Nayon - San Isidro Multi-purpose Cooperative of Ane-i (SIMCA).

5/ Fourteen percent of the sample farmer borrowers in Pualas paid in kind.

6/ Twenty percent of the sample farmer borrowers in Kibaning did not specify mode of repayment.

Source: Farmer Interviews

At the traders' level, about one third of the sample barangay traders were financed by the large municipal traders. A few barangay and municipal traders sampled obtained financing from the canvassers, particularly among those located in the southern and southwestern municipalities (Table 5.6).

2.2. Formal Sources Rural banks such as those in Kalilangan and Malaybalay and the Land Bank of the Philippines were the formal credit sources for farmers belonging to active farmer associations and cooperatives. At the Kalilangan Rural Bank, certificates of ownership of draft animals were accepted as collateral.

Among the traders, only a few municipal and provincial traders availed of bank financing. A greater percentage of the sample barangay, municipal and provincial traders relied on their own resources for capital (52 percent, 61 percent and 71 percent, respectively).

C. Behavior

The "sellers market" situation during most of the 1989 first cropping season further encouraged the common practice of mixing wet corn with dry corn before selling. That was not true early in the season when prices were still expected to drop as usually occurs during the peak harvests' "buyers market" conditions. Dry corn (14-15% m.c.) earned better prices from selective buyers who agreed to take any amounts delivered. In fact, a large mechanical dryer in Bukidnon was operating at full capacity. However, as the season progressed and exaggerated rumors of a "shortage" circulated with outside buyers eager to buy whatever was available, the situation changed.

The harvest of relatively large volumes of corn coincided with a "sellers market" mentality originating at the national level. Consequently, farm prices gradually went up and farmers worked fast to harvest their corn before prices dropped. As a result, substantial amounts of wet corn entered the market.

Within the marketing channels, many of the municipal and large traders had several buyers competing for their corn. Those buyers were so anxious to buy corn and could make daily shipments to Cebu end-users that quality (wetness) became a minor issue. Consequently, even those traders with drying capabilities resorted to mixing dry corn with wet corn rather than dry it.

Table 5.6 Traders' Sources of Capital by Type and Location First Cropping Season, 1989

SOURCES OF CAPITAL	TYPE OF TRADERS			TRADERS BY LOCATION		
	Barangay (n=25)	Municipal 1/ (n=36)	Provincial 2/ (n=7)	Claveria (n=9)	Malaybalay, Maramag, Don Carlos, Valencia (n=37)	Pangantucan, Kalilangan, Wao (n=22)
	(%)					
A. PERSONAL	52	61	71	67	57	45
B. LOAN						
1. Traders						
a) Regional	4	8			5	9
b) Provincial	4				3	
c) Municipal	28	3		22	14	5
2. Canvassers	8	11			8	9
3. Banks						
a) Public		6			5	
b) Private	4 3/	11	29	11	3	23
4. Relatives					5	9
TOTAL	96	83	71	89	87	68

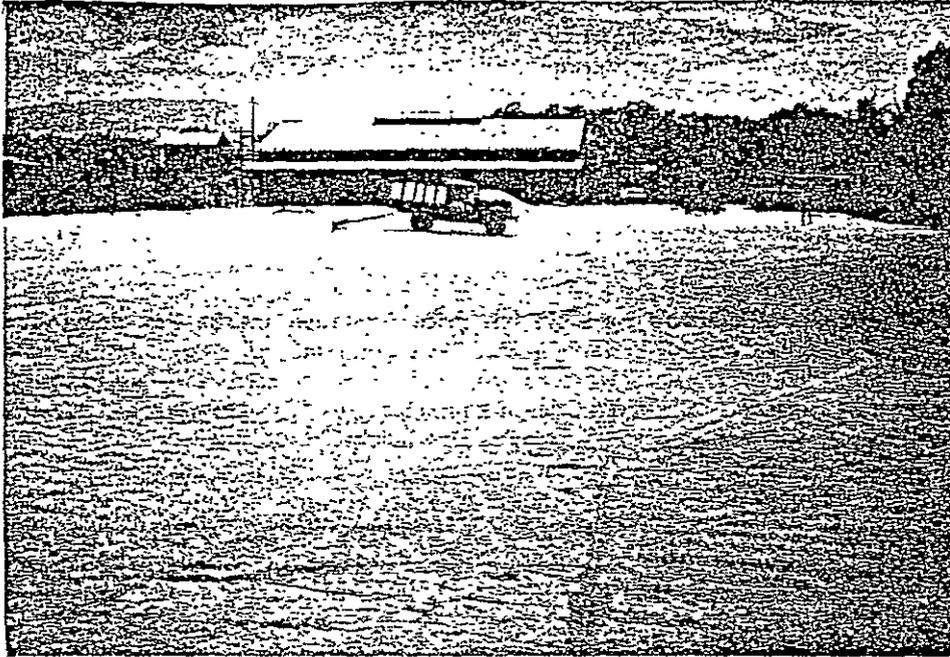
1/ Six of the sample municipal traders availed of credit from formal sources such as: Development Bank of the Philippines (DBP), Bank of the Philippine Islands (BPI) and Kalilangan Rural Bank (KRB). All are located in Bukidnon: In Malaybalay (two traders - DBP), (one trader-BPI) and Kalilangan (three traders - KRB).

2/ Each of two sample provincial traders in Valencia and Kalilangan availed of credit from Republic Planters Bank (Valencia Branch) and BA Finance (Regional Branch) respectively.

3/ A cooperative-barangay trader in Ane-i availed credit from Claveria Rural Bank (CRB)

Source: Trader Interviews

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Normal physical function as drying was bypassed as traders frantically sold wet corn when prices increased.

Meanwhile, price drop anxiety resulted in: a) accelerated movement of corn from production areas; b) acceptance of wet corn; c) low "reseo" penalties; d) daily shipments of high priced semi-wet or wet corn to Cebu starch manufacturers and millers; and e) increased incidence of too wet grits spoiling and being returned to Cebu millers. At practically each transaction, mixing of wet with dry corn occurred if time permitted; often the buyer just resacked and shipped it the next day.

Another behavioral aspect of this quality issue was that certain end-users for white corn, i.e., hog raisers and starch manufacturers, could immediately use wet corn in large volumes. On the other hand, corn millers, had to reduce moisture content by mixing dry with wet corn in order to avoid damage to machinery and/or prolong the shelf life of grits. With the former buyers absorbing large volumes from the market at uncommonly high prices, the corn millers with low inventories of corn (1 month or less) had no choice but to buy wet corn.

One consequence of those interrelated sets of behavior was to empty the supply areas of corn grain. Since high prices kept the NFA out of the market, even bodegas were completely empty.

Chapter VI

ECONOMICS

Relative to Northern Mindanao's corn system, price formation in the key demand sites of Cebu and Manila strongly influenced "reference prices" quoted in Mindanao trading centers. The Manila market more strongly influenced yellow corn prices whereas the prices of white corn were seriously affected by the corn millers and starch manufacturers in Cebu. Price formation also depended on the local prevailing market condition, i.e., prevalence of a "buyers market" or a "sellers market" condition.

In previous years, the July-September period was a "buyers market" for corn which prices dropped due to large scale harvests. However, during this peak harvest period for the first cropping season in 1989, a "sellers market" prevailed with unusually high prices at the farm level. Prices remained at a high level throughout that period except for a sudden drop in yellow corn price in September due to rumors on the impending importation of yellow corn.

Transportation costs which varied by road conditions and the distance to the region's major trading center, i.e., Cagayan de Oro City, accounted for most of the price differences between locations in the corn production areas.

Historically, the higher retail prices of rice in Cebu compared to corn grits gave the competitive edge to grits in terms of volume of sale. However, in September, 1989, this price spread was reversed, as the retail price of rice plunged upon the arrival of imported rice while the price of grits rose due to corn grain shortages. This extremely unusual situation for this season reflected the severity of the corn grain shortage.

The costs and returns of corn production substantially varied for yellow hybrids and traditional white corn varieties due mainly to the former's high level of cash inputs and consistently better yields. Marketing costs from sample farms to various market centers largely consisted of transportation costs.

Traders accrued positive returns when mixing wet or spoiled corn with dry and good quality corn and rapidly selling it during this particular season. The main reasons given for this practice included assurance that farmer-creditors would not sell even their poor quality harvests to the other buyers and more profit came from the rapid turn-over of corn rather than taking time to dry their purchases. This phenomena was especially frequent during a "sellers market", i.e., scarcity of corn, when traders could sell whatever quality they had available.

The comparative advantage in milling between Cagayan de Oro or Mindanao millers versus Cebu millers is analyzed based on factors relative to procurement, internal operations, sales strategies and competition.

The analyses of "prices" and "costs/returns" are the main topics in this chapter on the economics of the corn commodity system. Discussions on price focus on price formation, price differences between locations, price patterns by season, and price behavior. The cost/returns analysis covers corn production and trading. The comparative advantage in milling by locational difference is also analyzed from an industry-wide and firm-related perspective.

A. Pricing System

In a previous section of this report, macro price trend indicated low and sustained real prices for corn over the past several years. The national wholesale price for yellow corn remained higher compared to white corn. This year's first cropping season had an abnormally high price. This section covers four basic aspects of the pricing system: 1) price formation process, 2) price differences between locations; 3) seasonality of prices, and 4) price behavior. The unusual price behavior for corn during this year will be given special attention.

1. Price Formation

The price formation process involves: 1) the "reference prices" from the key demand sites, and 2) the prevailing market condition, in terms of a "buyers market" or a "sellers market".

1.1. Reference Prices Reference prices are those prices which later transactions can be based on. The two primary and one secondary demand sites which provided reference prices for Northern Mindanao's corn system were: 1) Manila-based prevailing prices which primarily reflected corn procurement by the large scale buyers, such as Integrators, grain traders, starch manufacturers, hog and poultry raisers and corn-based manufacturers; 2) Cebu-based prevailing prices which covered corn procurement by the trader/shippers; corn millers; feedmillers; commercial hog and poultry raisers; and manufacturers of corn-based products, especially starch in that city; and 3) Cagayan de Oro City-based prevailing prices which were based on the corn purchases by large traders and corn millers from the grain trader/shippers and large farmers in Bukidnon and Misamis Oriental.

The dominant influence of reference prices from these demand centers varied by type of corn, i.e., Manila's reference price for yellow corn reflected strong demands for feeds whereas Cebu's reference price for white corn corresponded with corn milling and starch manufacturing demands. None of these demand centers had any particular building or market place for grains trading but involved those businessmen telephoning or visiting buyers and sellers on a daily basis while monitoring corn arrivals and shipments.

1.2. Prevailing Market Condition The market situation within which transactions took place affected the price formation process. During the "buyers market", when sellers of surplus corn searched for buyers, the buyers in the demand centers were in a better bargaining position and thereby bidded lower prices for the corn offered. Thus, during this market condition, Cebu buyers (particularly for white corn) and Manila buyers (especially for yellow corn), had stronger bargaining positions during price negotiations with Cagayan de Oro trader/shippers. Prices generally dropped quickly and recovered slowly during this market condition.

Conversely, during the "sellers market" when corn was scarce, the buyers searched for more suppliers. CDO trader/shippers as sellers could increase their offer price based on their volume available and the strength of their bargaining position. Consequently, demand area reference prices rose as buyers bidded higher and higher prices for scarce corn from suppliers.

During the peak harvests for this first cropping season, the expected "buyers market" condition did not occur. Nationwide demands for corn far exceeded available harvest and stocks, causing a "sellers market" that was sustained beyond the January-June lean months. Reference prices rose in all demand centers.

2. Price Differences Between Locations

Price differences in two locational situations were compared: 1) among the sampled municipalities and barangays within the supply areas; and 2) among the supply, secondary demand and primary demand areas of Malaybalay, Bukidnon; Cagayan de Oro; and Cebu, respectively.

2.1. Selected Municipalities and Barangays Relative to CDO Cagayan de Oro City served as a major secondary demand center and transshipment port for corn. Thus, the road conditions and distances of trading centers in the corn supply areas from CDO roughly corresponded to differences in the buying prices per location. With a reference price of P 4.20/kg for corn in CDO, the prevailing buying prices by location decreased as the distance from Cagayan de Oro increased (Table 6:1). The transport costs which varied by distance and road condition accounted for most of the differences in prices by location as will be explained in Chapter VII. For instance, it was especially costly to transport from Wao due to the damaged wooden bridges and rutted road to Maramag before reaching the asphalt highway.



BEST
AVAILABLE

The poor condition of roads increased the cost of transporting corn.

Table 6.1 Prevailing Corn Prices at Sample Sites Relative to Cagayan de Oro Price at the Same Point In Time (August, 1989)

Sample Municipality/ Barangay	Barangay Trader	Municipal Provincial Trader	CDO Regional Trader
(P/Kg)			
CLAVERIA (Poblacion)		3.90	4.20
Hinaplanan	3.65-3.70		4.20
Ane-i	3.70-3.75		4.20
MALAYBALAY (Poblacion)		3.95	4.20
Magsaysay	3.70-3.75		4.20
Aglayan	3.80-3.85		4.20
DON CARLOS (Poblacion)		3.85	4.20
New Visayas *	3.60-3.65		4.20
Pualas	3.65-3.70		4.20
KALLANGAN (Poblacion)		3.70	4.20
Kibāning	3.40-3.45		4.20
Lampanusan	3.45-3.50		4.20
WAO (Poblacion):		3.60	4.20
Milaya *	3.15-3.20		4.20
Katutungan *	3.25-3.30		4.20

Note: Because trader/shippers in Cagayan de Oro City (CDO) are a major final destination of corn sent from most municipal and barangay traders in the supply areas, supply area traders refer their buying price to the prevailing CDO price. Distance/access serve as a proxy for transport costs (See Table 7.1).

* Our sample farmers seldom sold their corn to the barangay traders.

Source: Trader Interviews

2.2. Malaybalay to CDO to Cebu Price Comparisons Monthly wholesale prices for white and yellow corn in Malaybalay (Bukidnon), Cagayan de Oro and Cebu are compared for the peak harvest season from July to September, 1989 (Table 6.2a - 6.2b). The distance and cost of land transportation from Malaybalay to CDO and of sea freight from CDO to the Cebu port were roughly similar. However, the variation in price differences between locations was substantial. The price differences between Malaybalay and CDO ranged from a monthly low of P 0.21/kg to a high of P 0.33/kg for white and P 0.33/kg to P 0.42/kg for yellow during that four-month period with a variability of P 0.12/kg and P 0.09/kg, respectively. However, the price differences between CDO and Cebu ranged from P 0.43/kg and P 0.87/kg for white and P 0.66/kg to P 0.99/kg for yellow with a variability of P 0.44/kg and P 0.33/kg, respectively. In other words, prices in Bukidnon Province tended to move upwards in a much more parallel fashion relative to CDO than CDO prices did relative to Cebu prices. Apparently, given fairly constant transportation costs over both distances, CDO trader margins should have been particularly favorable during that unusual August and September, 1989 period especially for white corn.

3. Price Seasonality

The monthly wholesale prices for white and yellow corn in the production area of Malaybalay, Bukidnon were averaged for the 5 year period of 1984-88 and compared to that location's 1989 price and with the corresponding sets of prices for the secondary demand area of CDO (Figures 6.1 and 6.2a - 6.2b and Appendices 22 and 23). The usual price seasonality patterns for 1984-1989 were lower prices during the peak season of June to October/November in Bukidnon and June to December in CDO. Prices paid by Bukidnon millers were generally higher for white corn whereas traders usually paid more for yellow corn as reflected in the CDO prices.

In 1989, the seasonal price pattern did not occur as illustrated with June-July's high prices which generally continued at high levels until December, for yellow corn and October, for white corn. However, the impact of rumors on impending corn importation in September caused a sudden price drop in yellow corn during that month. The effect on Cagayan de Oro prices for yellow corn by corn importation is further discussed in the immediately following section on "Price Behavior."

4. Price Behavior

Historical prices of corn (1984-1988) in Malaybalay, Bukidnon and Cagayan de Oro as shown in Figures 6.1 and 6.2a - 6.2b reflects various degrees of fluctuations during the lean and harvest periods. During the corn-scarce months from January to May, prices gradually increased in small increments but as soon as the harvests started in June/July, prices dropped rapidly reaching their lowest in August when harvests glutted the market. "Price fluctuations" referred to by the farmers and traders interviewed meant the abrupt price fall during peak months and not the "slow" upward movement of prices from October, onwards. This period of falling prices were considered very risky for their livelihood. Traders pointed out that prices fluctuated even three times within a day during that peak period.

Table 6.2a Average Monthly Buying Prices for White corn at Three Buying Centers within the Corn System, First Cropping Season, 1989

M O N T H S	L O C A T I O N ^{1/}		
	MALAYBALAY (BUKIDNON)	CAGAYAN DE ORO	CEBU
	----- (P/Kg) -----		
June	4.14	0.21	4.35
		0.43	4.91
July	4.85	0.33	4.38
		0.53	4.91
August	3.98	0.26	4.24
		0.73	4.97
September	4.57	0.25	4.82
		0.87	5.69

^{1/} Locations include the production area (Malaybalay), transshipment port (Cagayan de Oro) and consumption area (Cebu).

Sources: Malaybalay (Traders), Cagayan de Oro (Traders and NFA), Cebu City (NFA)

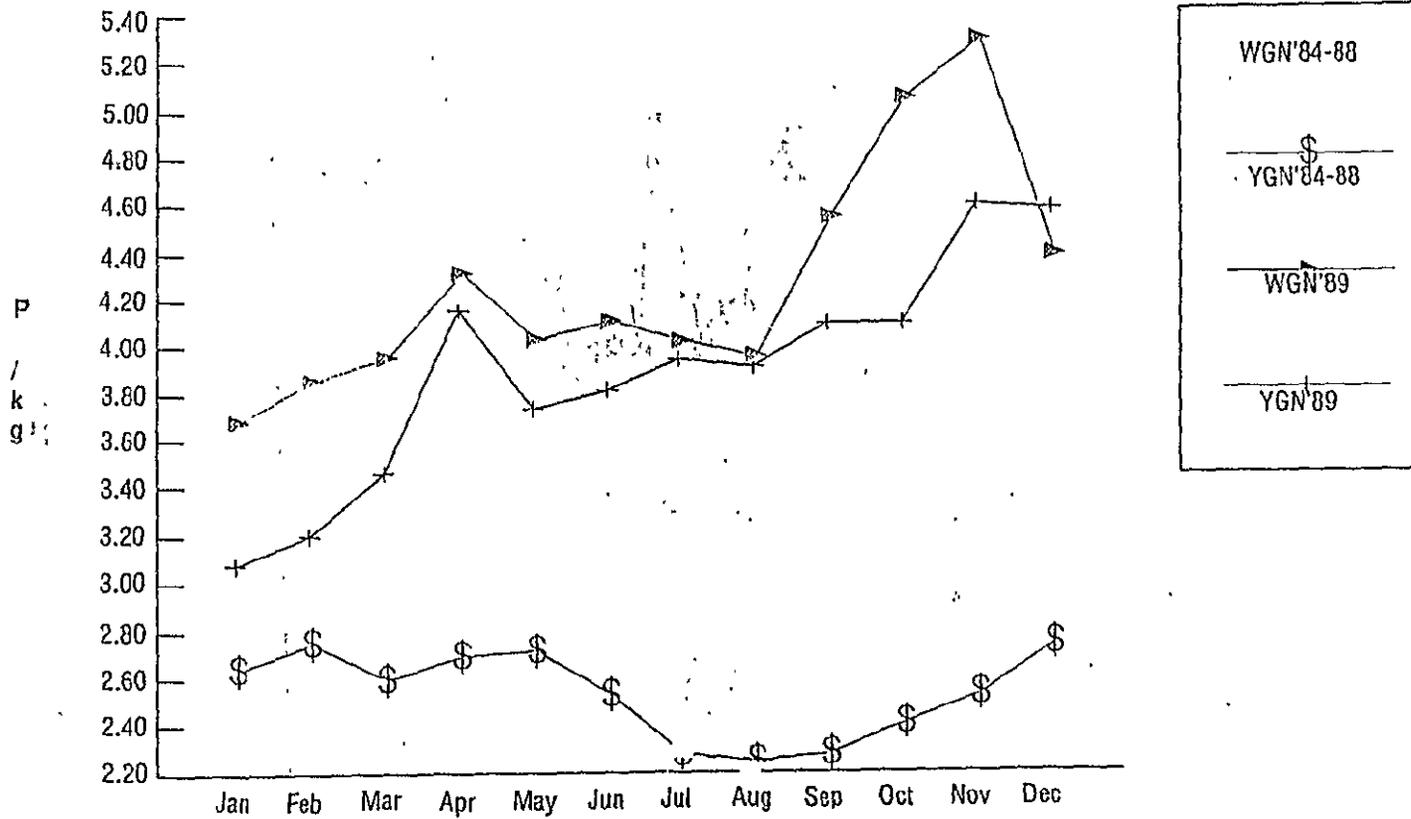
Table 6.2b Average Monthly Buying Prices for Yellow Corn at Three Buying Centers within the Corn System, First Cropping Season, 1989

M O N T H S	L O C A T I O N ^{1/}		
	MALAYBALAY (BUKIDNON)	CAGAYAN DE ORO	CEBU
	----- (P/Kg) -----		
June	3.84	4.17	4.90
	-----	-----	-----
	0.33	0.73	
July	3.97	4.34	5.00
	-----	-----	-----
	0.37	0.66	
August	3.94	4.35	5.08
	-----	-----	-----
	0.41	0.73	
September	4.12	4.54	5.53
	-----	-----	-----
	0.42	0.99	

^{1/} Locations include the production area (Malaybalay), transshipment port (Cagayan de Oro) and consumption area (Cebu).

Sources: Malaybalay (Traders), Cagayan de Oro (Traders), Cebu City (HFA)

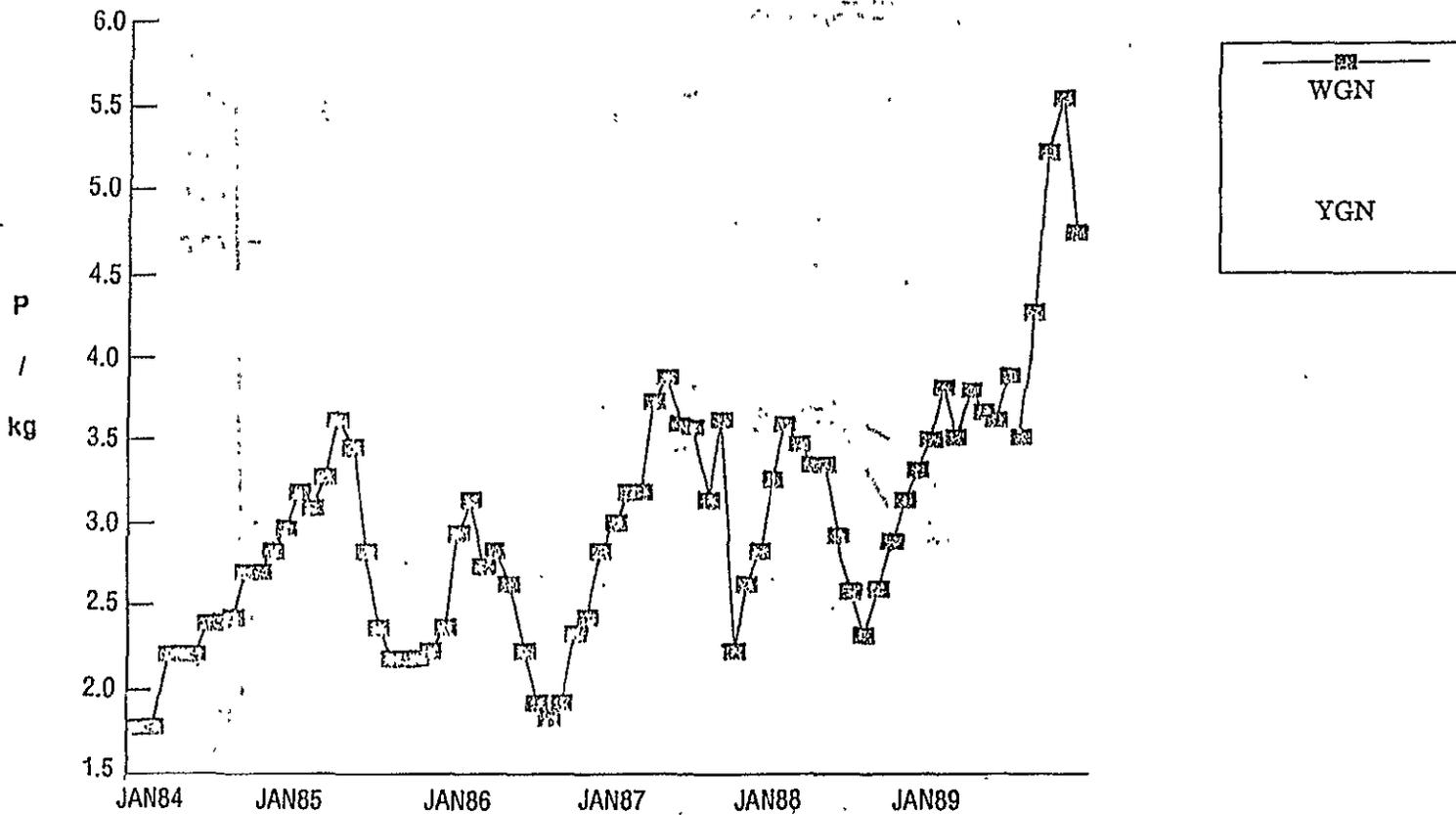
Figure 6.1 MONTHLY AVERAGE WHOLESALE PRICES OF WHITE AND YELLOW CORN GRAINS
IN MALAYBALAY, BUKIDNON, 1984-88 AND 1989 1/



1/ Refer to Appendix 22 for actual data.

Source: Trader Interviews

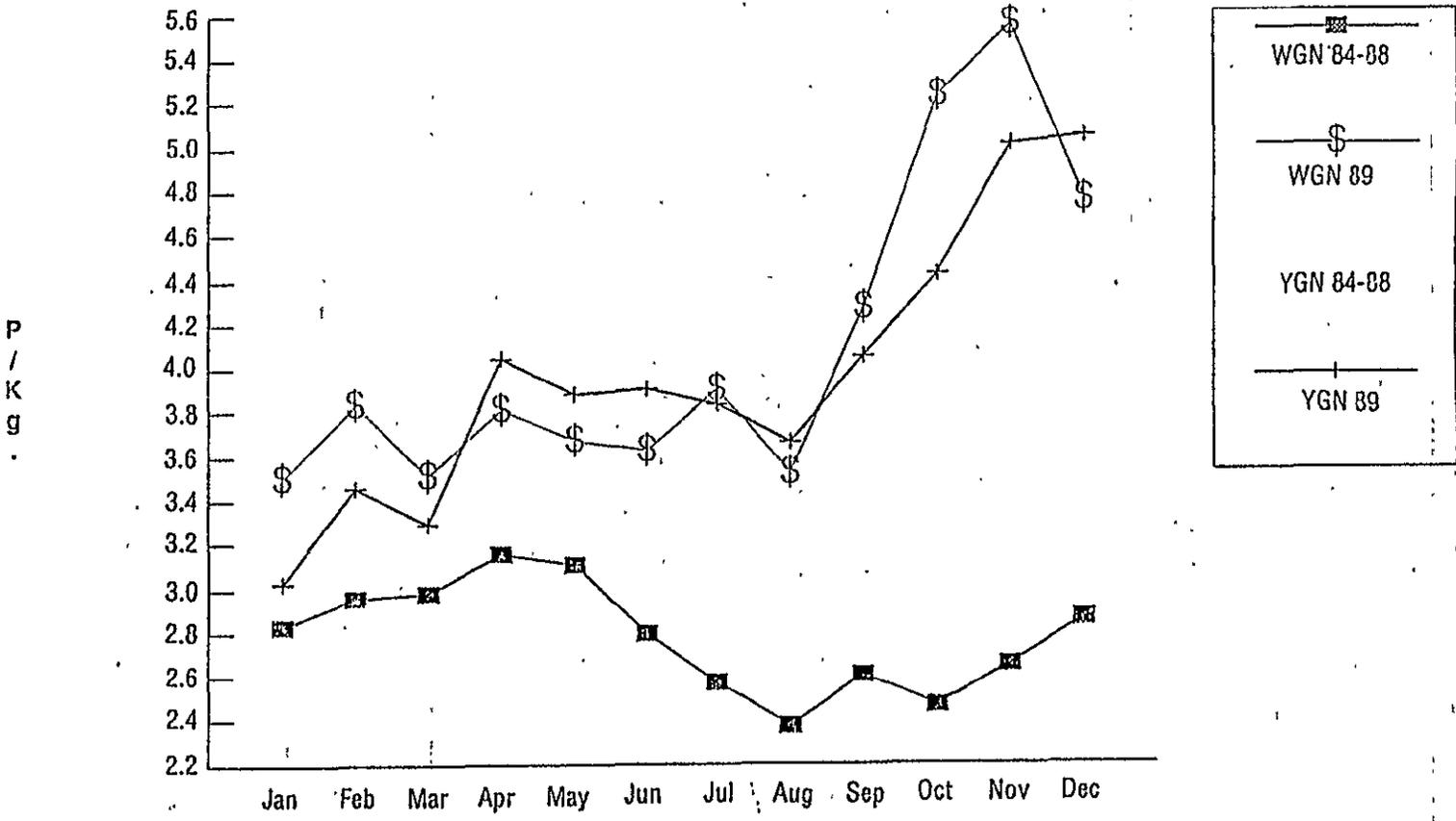
Figure 6.2a MONTHLY AVERAGE PRICES OF WHITE AND YELLOW CORN GRAINS
IN CAGAYAN DE ORO, 1984-1989 1/



1/ Refer to Appendix 23 for actual data.

Source: Trader Interviews

Figure 6.2b MONTHLY AVERAGE PRICES OF WHITE AND YELLOW CORN GRAINS
IN CAGAYAN DE ORO, 1984-88 AND 1989 ^{1/}



^{1/} Actual prices are in Appendix 23.

Source: Trader Interviews

This study documented the CDO market responses to rumors of imports with interviews as well as price data showing that yellow corn prices sharply dropped from P 4.75 to P 4.20 during the third week of September, 1989 (Figure 6.3). Several local trader/shippers ceased buying when Manila buyers warned them of the impending arrival of imported yellow corn for big feedmillers in Manila. In the meantime, white corn prices remained at high levels until October as Cebu millers frantically searched for white corn to mill. The importation eliminated the usual parallel movement of white and yellow corn prices.

5. Price Difference by Form or Substitute

5.1. Grain Prices Compared to Grits Prices in CDO and Cebu Corn grits prices in Cagayan de Oro and Cebu followed a similar trend to that of white corn grain prices, confirming the direct relationship between these two commodities. The highest prices of corn grits ever recorded in both Cagayan de Oro and Cebu were in 1989. (Figures 6.4 and 6.5 and Appendices 24 and 25).

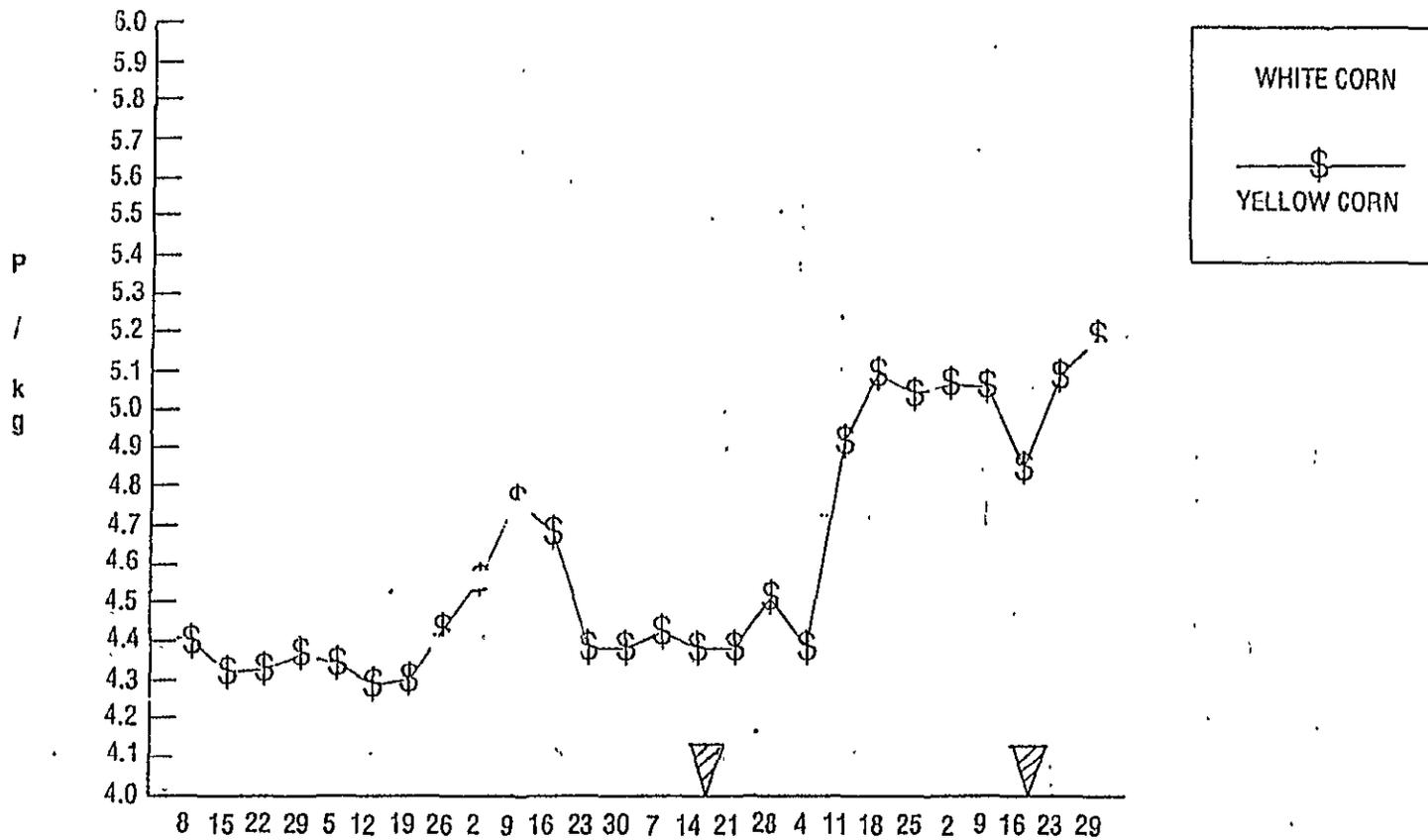
5.2. Comparison of Retail Prices of Grits to Rice in Cebu A comparison of monthly retail prices of rice and grits in Cebu City averaged over the 1984-89 period confirmed that historically, consumers had paid higher prices for rice than grits, especially during the corn harvest season around August (Figure 6.6 and Appendix 26). However, in 1989 the margin between retail prices of grits and rice rose only until September because the arrival of rice imports drastically dropped the retail prices of rice relative to grits for that month. By October, the difference again widened only to narrow in December. In other words, the previous and relatively stable retail market for rice had become erratic in 1989. Cebu millers contended that grits have lost their competitive position relative to retail rice sales due to both the higher costs of corn grain and the behavior of prices for rice. This pattern could tend to further erode the position of grits in the Cebuano diets.

B. Costs/Returns

The three main types of costs/returns analyses presented are related to farmers' corn production, traders' marketing of grain and corn millers' processing of grits. At the production level, costs/returns were computed according to: 1) variety, i.e., yellow hybrids versus white open pollinated varieties; and 2) sales at the farmgate versus further up the marketing channel, as most of the sample farmers actually did. At the distribution level, the full array of marketing costs starting at different production locations and extending to CDO are illustrated. The cost incentive for mixing wet and dry corn grains were examined. At the processing level, the comparative advantage of commercial milling closer to the sources of corn rather than the demand areas were considered.

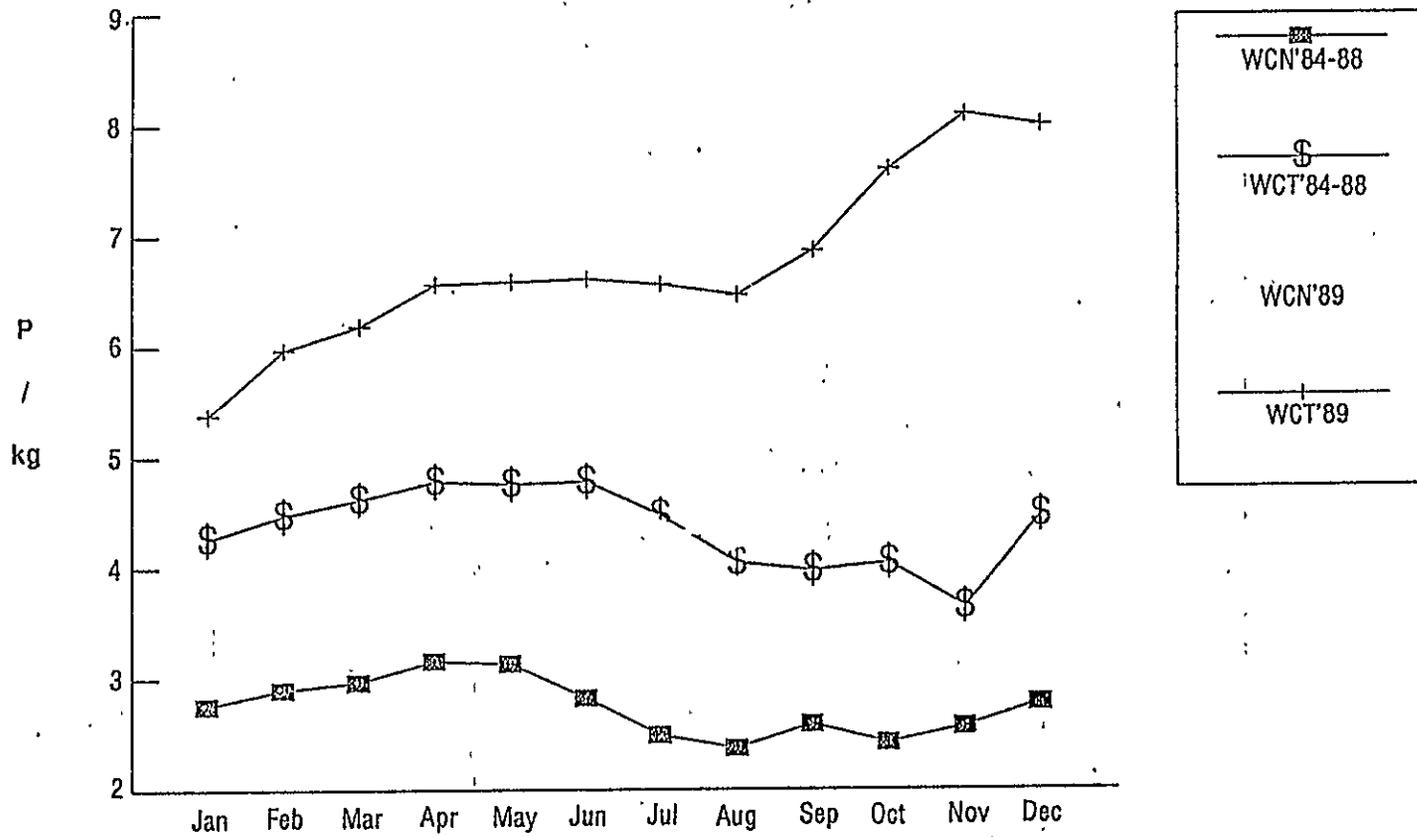
It should be emphasized that costs/returns presented for the trading and processing functions include only variable costs, and thus, are returns above variable costs. Too many difficulties were encountered in estimating fixed costs.

Figure 6.3 IMPACT OF IMPORTATION ON BUYING PRICES OF CORN IN CAGAYAN DE ORO,
JULY - DECEMBER, 1989



▽ Actual arrival date of corn imports.
Source: Trader Interviews

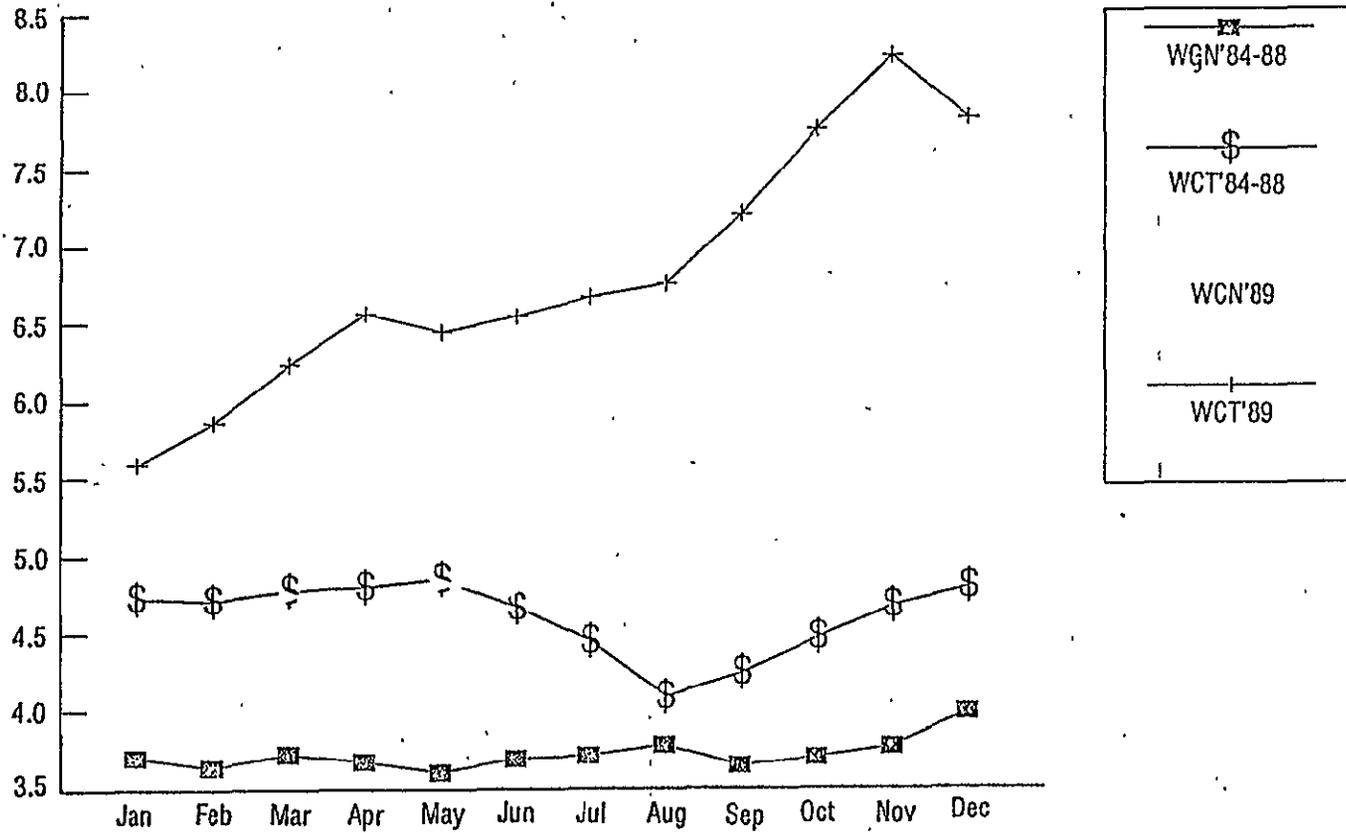
Figure 6.4 MONTHLY AVERAGE PRICES OF WHITE CORN GRAINS AND GRITS
IN CAGAYAN DE ORO, 1984-88 AND 1989 1/



1/ Refer to Appendix 24 for actual data.

Source: National Food Authority, Region X

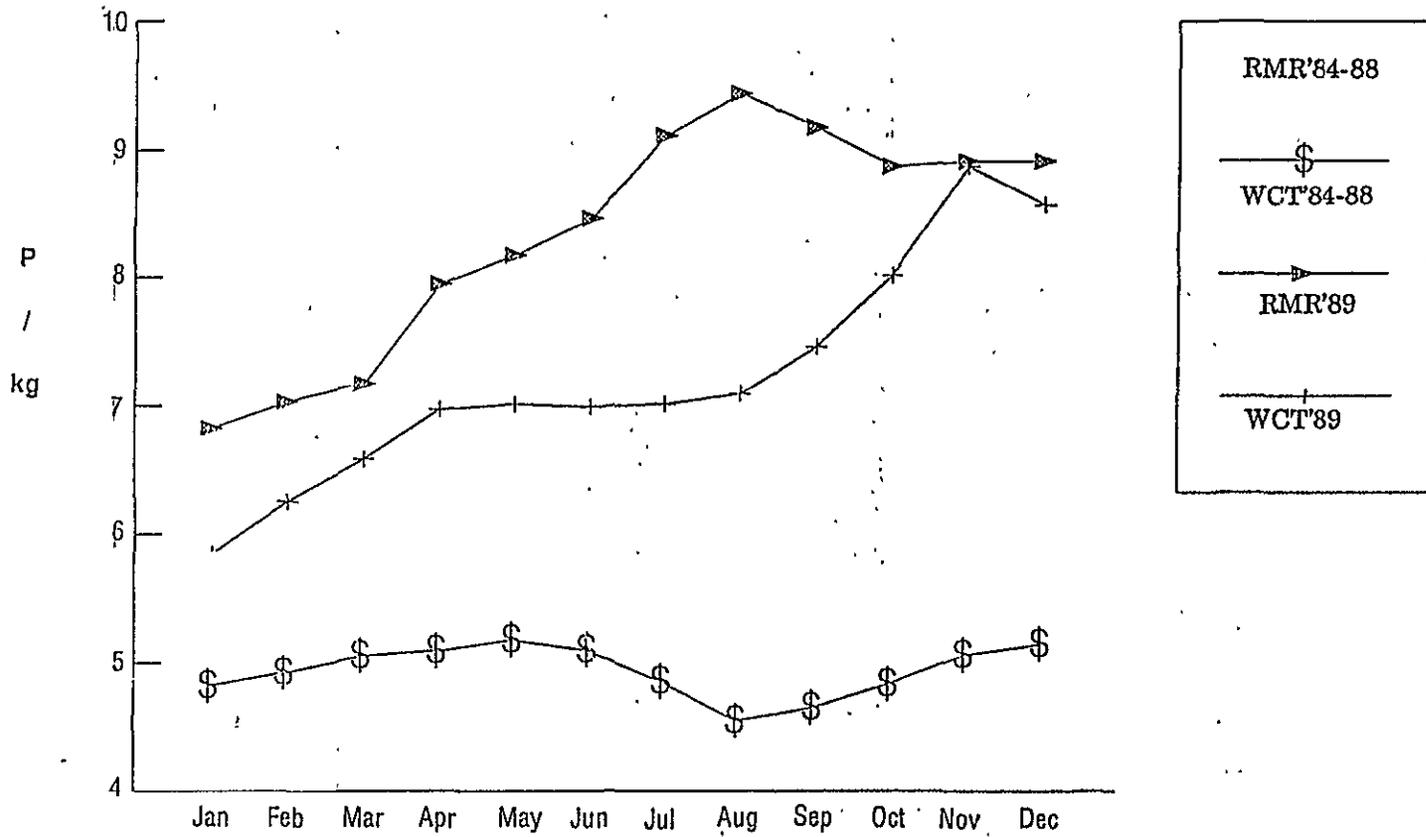
Figure 6.5 MONTHLY AVERAGE PRICES OF WHITE CORN GRAINS AND GRITS IN CÉBU CITY, 1984-88 AND 1989 1/



1/ Refer to Appendix 25 for actual data

Source: National Food Authority, Cebu City

Figure 6.6. MONTHLY RETAIL PRICES OF REGULAR MILLED RICE (RMR) AND WHITE CORN GRITS (WCT), CEBU CITY, 1984-88 AND 1989 1/



1/ Refer to Appendix 26 for actual data

Source: National Food Authority, Cebu City

1. Costs/Returns to Corn Production

Within each of the 10 sample barangays, 2 yellow hybrid corn growers and 2 white corn growers were purposively selected and interviewed on the details of their production costs. Despite the study team's search for barangays with similar proportions of yellow and white varieties, farmers growing yellow hybrid were found scarce in three interior barangays and white corn growers were difficult to locate in two roadside barangays during that first cropping season.

The small sample of production costs was collected in order to substantiate and measure the magnitude of costs and returns differences between yellow hybrids and white corn pollinated varieties, especially as related to such characteristics as size of farm, use of cash for inputs, and location. The 40 sample farmers were characterized according to: 1) the range of farm size from 1 ha to 12 has with field sizes from 1 ha to 30 has; 2) 77.5% were owner cultivators whereas 15.0% were tenants and 7.5% as CLT holders; 3) 30.0% sold their harvests in July, 52.5% in August and 2.5% in September; 4) 22.5% sold their harvests at the farmgate while 77.5% sold it off-farm; and 5) all used family labor to some extent, especially farmers who grew white corn (Table 6.3).¹

1.1. Costs/Returns By Variety Varietal differences were substantial. Of the 40 sample, 20 grew yellow hybrids and 20 cultivated white varieties with the average total costs for yellow at P 7,871/ha with an average yield of 3,444 kg/ha and net return of P 5,697/ha; compared to the cost of P 4,727/ha yielding 2,067 kg/ha and earning P 3,227/ha for white, on the average. The barangay of Kibaning averaged the largest net return at P 13,334/ha for yellow corn growers while white corn growers in barangay Lampanusan earned the highest return at P 6,068/ha. Both barangays are located in the fertile and progressive corn growing municipality of Kalilangan in Bukidnon province.

For yellow corn, the total cost per hectare ranged from P 4,658/ha to P 11,452/ha with cash costs from P 4,104/ha to P 10,862/ha. White corn total costs ranged from P 2,657/ha to P 6,808/ha, with cash costs from P 1,368/ha to P 6,415/ha. On the average, 92% of total costs were cash costs for yellow corn growers compared to 83% for white corn varieties. It should be noted that the sample white corn varieties included some improved open-pollinated variety, in addition to the traditional "tiniguib" variety.

On the comparison of break-even prices, i.e., the price at which costs would equal return with a P 2.90/kg prevailing support price, sample yellow and white corn farmers in Hinaplanan, Claveria and yellow corn farmers in Milaya are shown to have incurred substantial losses. The overall break-even prices for yellow was P 2.43/kg and for white, P 2.35/kg which appear quite high.

¹ To further portray the sample corn production areas which will help clarify the analysis on costs and returns, a detailed calendar of activities for yellow corn (hybrid) inclusive of labor required per stage of production is contained in Appendix 27. The comparative costs of labor within the specific barangays sampled are presented in Appendix 28 and in more detailed presentation in Appendix 29a - 29c.

TABLE 6.3. COMPARATIVE AND RETURNS PER HECTARE OF YELLOW HYBRID AND WHITE CORN FARMERS IN SAMPLE BARANGAYS, FIRST CROPPING SEASON, 1989 /1/

Table 6-3a: Farmers in Claveria and Malaybalay -2/

MUNICIPALITY	CLAVERIA								MALAYBALAY							
	HINAPLANAN				ANEI				MACSAYSAY				AGLAVAN			
BARANGAY	YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
CORN VARIETY USED	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%
ITEMS FOR ANALYSIS	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%	PHa	%
CASH COSTS																
1 Land preparation	800	17	690	26	1,057	16	1,078	29	305	4	246	8	800	8	610	8
2 Seeds	605	12	40	2	60	13	40	1	84	13	43	1	85	8	42	1
3 Fertilizers	1,581	31	740	14	2,045	31	205	6	1,167	17	0	0	2,316	23	1,640	26
4 Pesticides	0	0	0	0	0	0	0	0	0	0	0	0	120	1	0	0
5 Labor	785	15	270	10	613	9	321	15	711	10	428	14	848	9	868	14
6 Miscellaneous (lime/landlord share, land & animal rental)	285	5	0	0	20	4	84	16	800	12	0	0	740	7	1,275	20
Subtotal	4,151	80	1,370	52	4,865	73	2,361	65	3,877	56	718	24	5,761	56	4,385	68
NON-CASH COSTS																
Subtotal	80	1	36	13	464	7	30	1	735	11	1,144	38	287	3	978	15
TOTAL PRODUCTION COSTS	4,231	81	1,706	64	5,329	80	2,391	67	4,612	67	1,862	61	6,048	59	5,363	84
PRE-MARKETING COSTS																
1 Harvesting	819	12	791	30	1,004	15	879	28	1,348	19	788	25	2,985	29	475	7
2 Shelling	117	2	70	3	240	4	145	5	208	3	225	7	362	4	171	3
3 Drying	104	2	75	3	5	1	0	0	494	7	26	1	91	1	17	1
4 Hauling	110	2	0	0	0	0	0	0	172	2	82	3	0	0	29	0
TOTAL PRE-MARKING COSTS	950	19	386	35	1,349	20	1,168	33	2,178	32	1,102	36	3,448	34	712	11
MARKETING COSTS																
1 Transportation	0	0	16	1	0	0	0	0	122	2	80	3	753	7	285	5
TOTAL CASH COSTS (PRODUCTION, PRE-MARKING, MARKETING)	5,126	90	2,322	67	6,240	93	3,526	90	6,177	90	1,900	62	9,492	97	6,364	95
TOTAL COSTS	5,186	100	2,657	100	6,704	100	3,546	100	6,912	100	3,944	100	10,249	100	6,343	100
GROSS RETURN	6,745		3,428		14,214		7,496		11,128		6,672		18,187		8,425	
NET RETURN																
CASH COSTS	1,619		1,105		2,874		3,870		4,951		3,672		8,235		4,051	
ALL COSTS	1,559		771		2,510		3,540		4,216		2,528		8,948		3,082	
BREAK-EVEN PRICE																
CASH COSTS	3.12		2.64		1.51		1.64		2.22		1.26		2.21		2.32	
ALL COSTS	3.15		3.02		1.63		1.65		2.46		2.18		2.27		2.75	
SIZE OF FARM	1	2.00	3.50	17.00	3.00	5.00	3.00	5.00	3.00	5.00	3.00	5.00	3.00	5.00	3.00	5.00
(ha) 2/	2	11.00	3.00	3.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
CORN AREA (ha)	1	2.00	2.50	1.50	2.00	4.00	3.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
2	5.00	1.50	4.00	1.00	1.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
TENURE STATUS	1	OWNER CULT.	OWNER CULT.	OWNER CULT.	OWNER CULT.	CLT HOLDER	CLT HOLDER	TENANT	OWNER CULT.	CLT HOLDER	CLT HOLDER	TENANT	OWNER CULT.	OWNER CULT.	OWNER CULT.	OWNER CULT.
2	OWNER CULT.	OWNER CULT.	OWNER CULT.	OWNER CULT.	OWNER CULT.	OWNER CULT.	OWNER CULT.	LEASE HOLDER	OWNER CULT.	CLT HOLDER	CLT HOLDER	LEASE HOLDER	OWNER CULT.	OWNER CULT.	OWNER CULT.	OWNER CULT.
SLOPE OF THE LAND	1	ROLLING	FLAT	FLAT/UNDULAT.	FLAT	FLAT	FLAT	ROLLING	FLAT	ROLLING	FLAT	ROLLING	FLAT	ROLLING	FLAT	ROLLING
2	FLAT/ROLLING	ROLLING	SLIGHTLY ROLL.	FLAT	ROLLING	FLAT	ROLLING	FLAT	FLAT	FLAT	FLAT	FLAT	FLAT	ROLLING	ROLLING	ROLLING
HARVESTING	1	7.1	10.1	10.1	8.1	9.1	9.1	7.1	7.1	7.1	7.1	10.1	10.1	10.1	10.1	10.1
2	10.1	6.1	10.1	8.1	8.1	8.1	8.1	6.1	6.1	6.1	6.1	10.1	10.1	10.1	10.1	10.1
ARRANGEMENTS	1	M-AUGUST	B-AUGUST	B-JULY	B-AUGUST	M-AUGUST	M-AUGUST	M-MARCH	M-AUGUST	M-AUGUST	M-MARCH	M-AUGUST	M-AUGUST	M-JULY	M-AUGUST	M-AUGUST
2	B-AUGUST	M-SEPTEMBER	M-AUGUST	M-AUGUST	M-AUGUST	M-AUGUST	M-AUGUST	M-MARCH	M-AUGUST	M-MARCH	M-MARCH	B-AUGUST	B-AUGUST	B-AUGUST	B-AUGUST	B-AUGUST
YIELD (kg/ha)	1	1,653	1,223	860	2,620	3,134	3,134	1,285	1,633	1,633	1,633	1,633	3,134	3,134	3,134	3,134
2	1,635	745	2,640	1,707	2,430	2,430	2,430	1,500	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
SELLING PRICE (P/kg)	1	4.10	3.60	3.40	3.20	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2	4.10	4.20	3.50	3.75	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

1/ Based on actual costs, i.e., these include imputed costs for labor. Comparative costs of labor at research sites are in Appendix 28.

2/ Two yellow hybrid corn and two white corn farmers were interviewed per barangay for this cost and returns analysis. Thus, figures in each column for YC and WC indicate the average for 2 farmers. Also, under Size of Farm, etc., "1" and "2" refers to the first and second farmers interviewed, respectively.

3/ B, M and E means "beginning", "middle" and "end" of the month, respectively.

Source: Farmer Interviews

1/
TABLE 6.3 b Farmers in Don Carlos and Kallangan

MUNICIPALITY		DON CARLOS							
BARANGAY		NEW VISAYAS				PUALAS			
CORN VARIETY USED		YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
ITEMS FOR ANALYSIS		P/Ha	%	P/Ha	%	P/Ha	%	P/Ha	%
CASH COSTS									
1. Land preparation		825	15	0	0	810	14	730	14
2. Seeds		600	13	40	1	355	6	59	1
3. Fertilizers		1,239	29	248	9	1,529	28	1,428	28
4. Pesticides		0	0	0	0	0	0	0	0
5. Labor		658	14	0	0	276	5	978	19
6. Miscellaneous (lime, landlord share, land & animal rental)		0	0	0	0	0	0	0	0
Sub-total		3,422	73	288	10	2,980	51	3,195	63
NON-CASH COSTS									
Sub-total		87	2	1,494	52	1,761	30	370	7
TOTAL PRODUCTION COSTS		3,509	75	1,782	62	4,741	81	3,565	71
PRE-MARKETING COSTS									
1. Harvesting		752	16	539	19	889	15	963	19
2. Shelling		99	2	128	4	150	3	56	1
3. Drying		50	1	64	2	85	1	130	3
4. Hauling		248	5	349	12	0	0	208	4
TOTAL PRE-MKTNG COSTS		1,149	25	1,080	38	1,124	19	1,362	27
MARKETING COSTS									
1. Transportation		0	0	0	0	0	0	112	2
TOTAL CASH COSTS (PRODUCTION, PRE- MKTG, MARKETING)		4,571	98	1,368	48	4,104	70	4,669	93
TOTAL COSTS		4,658	100	2,862	100	5,865	100	5,039	100
GROSS RETURN		8,539		3,901		8,225		8,580	
NET RETURN									
CASH COSTS		3,968		2,533		4,221		3,911	
ALL COSTS		3,881		1,039		2,460		3,541	
BREAK-EVEN PRICE									
CASH COSTS		1.85		1.24		1.82		2.12	
ALL COSTS		1.88		2.60		2.61		2.29	
SIZE OF FARM	1.	15.00		3.00		1.25		6.00	
(ha) 1/	2.	1.00		3.25		1.75		20.00	
CORN AREA (ha)	1.	2.00		2.00		1.25		1.00	
	2.	1.00		1.50		1.00		12.00	
TENURIAL STATUS	1.	OWNER CULT.		OWNER CULT.		OWNER CULT.		OWNER CULT.	
	2.	OWNER CULT.		OWNER CULT.		TENANT		OWNER CULT.	
SLOPE OF THE LAND	1.	ROLLING		FLAT		FLAT		FLAT	
	2.	FLAT		ROLLING		SLIGHTLY ROLL		SLIGHT ROLL	
HARVESTING	1.	10:1		9:1		9:1		10:1	
ARRANGEMENTS	2.	9:1		9:1		8:1		8:1	
TIME OF HARVEST 2/	1.	M-AUGUST		E-JUNE		B-AUGUST		E-JULY	
	2.	B-AUGUST		E-JULY		M-JULY		E-JUL-B-AUG	
YIELD (kg/ha)	1.	2,250		990		2,650		2,150	
	2.	2,700		1,207		1,850		2,250	
SELLING PRICE	1.	3.60		3.40		3.70		3.70	
(P/kg)	2.	3.30		3.70		3.70		4.10	

1/ Two yellow hybrid corn and two white corn farmers were interviewed per barangay for this costs and returns analysis. Thus, figures in each column for YC and WC indicate the average for 2 farmers. Also, under Size of Farm, etc., "1" and "2" refers to the first and second farmers interviewed, respectively.

2/ B, M and E means "beginning", "middle" and "end" of the month, respectively.

Source: Farmer Interviews

Table 6.3b continued ...

MUNICIPALITY		KALILANGAN							
BARANGAY		KIBANING				LAMPANUSAN			
CORN VARIETY USED		YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
ITEMS FOR ANALYSIS		P/Ha	%	P/Ha	%	P/Ha	%	P/Ha	%
CASH COSTS									
1. Land preparation		100	1	385	7	745	7	309	5
2. Seeds		830	7	37	1	908	9	390	6
3. Fertilizers		3,222	28	1,706	33	3,831	39	1,622	24
4. Pesticides		0	0	30	1	62	1	40	1
5. Labor		822	5	530	10	705	7	268	4
6. Miscellaneous (lime, landlord share, land & animal rental)		400	3	0	0	0	0	0	0
Sub-total		5,174	45	2,688	52	6,351	63	2,619	39
NON-CASH COSTS									
Sub-total		580	5	1,265	24	453	5	1,380	21
TOTAL PRODUCTION COSTS		5,754	50	3,953	76	6,804	68	3,999	60
PRE-MARKETING COSTS									
1. Harvesting		1,254	11	737	14	1,484	15	1,824	27
2. Shelling		304	3	100	2	183	2	180	3
3. Drying		115	1	42	1	73	1	40	1
4. Hauling		1,309	11	386	7	89	1	222	3
TOTAL PRE-MKTNG COSTS		2,992	25	1,265	24	1,829	18	2,266	34
MARKETING COSTS									
1. Transportation		2,686	24	0	0	1,430	14	450	7
TOTAL CASH COSTS (PRODUCTION, PRE- MKTG, MARKETING)		10,862	95	3,953	76	9,610	95	5,335	79
TOTAL COSTS		11,452	100	5,218	100	10,063	100	6,715	100
GROSS RETURN		24,766		7,361		15,912		12,763	
NET RETURN									
CASH COSTS		13,924		3,408		6,302		7,448	
ALL COSTS		13,334		2,143		5,849		6,068	
BREAK-EVEN PRICE									
CASH COSTS		1.79		1.88		2.63		1.70	
ALL COSTS		1.89		2.48		2.75		2.14	
SIZE OF FARM									
1. (ha) 2/		1.00		7.00		3.00		1.00	
2.		30.00		8.00		2.50		4.00	
CORN AREA (ha)									
1.		1.00		3.00		3.00		1.00	
2.		4.00		2.00		2.50		4.00	
TENURIAL STATUS									
1.		LEASE HOLDER		OWNER CULT.		OWNER CULT.		TENANT	
2.		OWNER CULT.		OWNER CULT.		OWNER CULT.		OWNER CULT.	
SLOPE OF THE LAND									
1.		SLIGHTLY ROL		ROLLING		ROLLING		FLAT	
2.		ROLLING		SLIGHTLY ROL		ROLLING		ROLLING	
HARVESTING ARRANGEMENTS									
1.		1/CAN		11:1		10:1		9:1	
2.		1.25/CAN		9:1		10:1		9:1	
TIME OF HARVEST 3/									
1.		E-JULY		M-AUGUST		E-JUNE		B-AUGUST	
		B-AUGUST		M-JULY		B-JULY		M-JULY	
YIELD (kg/ha)									
1.		6,842		1,833		2,750		4,015	
2.		5,308		2,372		4,565		2,250	
SELLING PRICE (P/kg)									
1.		3.95		3.65		4.35		4.10	
2.		4.20		3.35		4.35		4.05	

Table 6.3c Farmers in Wao and Average for the 5 Municipalities Covered 1/

MUNICIPALITY BARANGAY	WAO								AVERAGE FOR THE FIVE MUNICIPALITIES COVERED			
	MILAYA				KATUTUNGAN				YELLOW CORN		WHITE CORN	
CORN VARIETY USED	YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
ITEMS FOR ANALYSIS	P/Ha	%	P/Ha	%	P/Ha	%	P/Ha	%	P/Ha	%	P/Ha	%
CASH COSTS												
1. Land preparation	225	3	360	7	602	6	380	6	643	5	663	10
2. Seeds	529	7	55	1	828	8	44	1	730	9	78	2
3. Fertilizers	2,614	38	1,380	27	2,767	27	1,539	27	2,276	29	1,049	22
4. Pesticides	0	0	0	0	0	0	0	0	18	0	7	0
5. Labor	844	11	609	12	1,443	14	640	9	753	10	510	11
6. Miscellaneous (time, landlord share, land & animal rental)	0	0	0	0	0	0	0	0	247	3	184	4
Sub-total	4,412	60	2,404	48	5,640	55	2,903	43	4,666	59	2,291	48
NON-CASH COSTS												
Sub-total	1,165	16	751	15	372	4	333	6	597	8	814	17
TOTAL PRODUCTION COSTS	5,577	76	3,155	63	6,012	59	3,236	48	5,264	67	3,105	66
PRE-MARKETING COSTS												
1. Harvesting	522	7	934	19	1,274	12	1,411	21	1,220	15	943	20
2. Shelling	186	3	121	2	412	4	218	3	230	3	146	3
3. Drying	84	1	45	1	417	4	82	1	157	2	54	1
4. Hauling	0	0	71	1	709	7	254	4	258	3	160	3
TOTAL PRE-MKTNG COSTS	792	11	1,171	23	2,812	27	1,965	29	1,864	24	1,302	28
MARKETING COSTS												
1. Transportation	1,014	14	706	14	1,414	14	1,547	23	743	9	320	7
TOTAL CASH COSTS (PRODUCTION, PRE- MKTG, MARKETING)	6,218	84	4,281	85	9,866	96	6,415	94	7,274	92	3,913	83
TOTAL COSTS	7,383	100	5,022	100	10,238	100	6,808	100	7,871	100	4,727	100
GROSS RETURN	8,028		8,294		18,606		12,606		13,568		7,955	
NET RETURN												
CASH COSTS	1,810		4,113		8,940		6,191		6,294		4,041	
ALL COSTS	645		3,362		8,568		5,798		5,697		3,227	
BREAK-EVEN PRICE												
CASH COSTS	2.97		1.76		2.05		2.16		2.22		1.88	
ALL COSTS	3.52		2.07		2.12		2.30		2.43		2.35	

1/ Two yellow hybrid corn and two white corn farmers were interviewed per barangay for this costs and returns analysis. Thus figures in each column for YC and WC indicate the average for 2 farmers. Also, under Size of Farm, etc., "1" and "2" refers to first and second farmers interviewed, respectively.
2 B, M and E means "beginning", "middle" and "end" of the month, respectively.

Source: Farmer Interviews

During the field work, discussions with progressive farmers indicated an attitude of "I would use more fertilizer if I had more money." This attitude discloses little understanding of the economics of production as the cost of additional fertilizer exceeded the value of the additional harvested corn. That is especially critical when applied to less responsive varieties or F2s.

1.2. Farmgate vs. Off-farm Costs/Returns Two scenarios on costs/returns to corn production are compared, i.e., farmers' returns at the farmgate and returns at the place actually sold (Table 6.4). The farmgate selling price used was the barangay trader's price. Returns at the farmgate are basically hypothetical figures but serve as the common denominator for comparing the break-even points in production among the sample farmers from different municipalities and barangays. The off-farm returns and break-even prices presented earlier in Table 6.3 were mostly those actually realized by the sampled farmers, but the selling prices used in the computations refer to the different types and locations of traders (i.e., barangay, municipal and CDO-based), making the comparative analysis difficult. The difference between the two scenarios shows that except for the farmers in Ane-i who sold outside the barangay, all the corn growers sampled obtained higher returns at off-farm sales sites, primarily due to higher prices in these locations. The sample farmers in Ane-i incurred "losses" because prices at the barangay level were slightly higher than the town's "poblacion" as Ane-i is nearer to CDO than the latter. In this specific case, the credit-marketing tie-up between the farmers and the municipal trader could be reason for the farmers' decision on sales site.

2. Traders' Marketing of Grain

Three types of cost analyses on marketing by traders are: a) post harvest and marketing costs, b) disposing of versus mixing spoiled corn, and c) drying wet corn versus mixing it with dry corn.

2.1. Post Harvest and Marketing Costs Since post harvest and marketing costs vary substantially by origin and destination, three scenarios were computed according to farmers, municipal traders and CDO traders/shippers costs. Estimates were based from four production locations of Malaybalay, Don Carlos, Kalilangan and Wao at 93 kms, 155 kms, 189 kms, and 200 kms from CDO, respectively (Table 6.5). Cebu is mainly the final destination for CDO trader/shippers.

Table 6.4a Farm Gate vs. In-Farm Costs and Returns of Yellow Hybrid and White Corn Farmers in Sample Barangays, First Cropping Season, 1989

MUNICIPALITY	CLAVERIA				MALAYBALAY				DON CARLOS			
	BINAPLANAN		ANE-I		MAGSAYSAY		AGLAYAN		NEW VISAYAS		PUALAS	
BARANGAY	Yellow Corn	White Corn										
TYPE OF CORN USED	Yellow Corn	White Corn										
ITEMS FOR ANALYSIS												
YIELD (kg/ha)	1,645	879	4,120	2,164	2,782	1,380	4,517	2,210	2,475	1,009	2,250	2,200
SCENARIO 1: FARMERS' RETURNS AT FARMGATE												
Farmgate (Brngy) Price (P)	3.56	3.52	3.50	3.38	3.40	3.28	3.78	3.78	3.30	3.30	3.66	3.66
Farmgate Gross Return (P)	5,869	3,064	14,420	7,711	9,459	4,509	17,074	8,732	8,168	3,027	8,235	8,032
Less: Production Cost (P) 3/	5,186	2,641	9,704	3,556	6,790	2,964	9,196	6,067	4,058	2,862	5,865	4,827
Net Return at Farmgate (P)	703	423	7,716	4,155	2,669	1,545	7,878	2,665	4,110	165	2,370	3,125
Break-even Price (P/kg)	3.15	3.00	1.63	1.65	2.44	2.13	2.10	2.62	1.88	2.60	2.61	2.24
SCENARIO 2: FARMERS' RETURNS AT PLACE ACTUALLY SOLD 4/												
Price at Actual Place Sold												
- Barangay (P)												
- Poblacion (Municipality) (P)	4.10 **	3.90 **	3.50 *	3.40 **	4.00 **	4.00 **		3.80 *	3.46 **	3.55 **	3.70 **	3.70 *
- Cagayan de Oro (P)							4.25 **	4.35 *				4.10 *
Transportation Cost to Actual Place/s Sold (P) 5/	0	16	0	0	122	80	763	200	0	0	0	112
Actual Gross Return (P)	6,745	3,428	14,214	7,186	11,128	5,572	19,187	9,425	8,539	3,501	8,225	8,580
Less: Production + Marketing Costs	5,186	2,657	9,704	3,556	6,912	3,044	10,249	6,343	4,058	2,862	5,865	5,003
Actual Net Return at Sales Point (P)	1,559	771	7,510	3,630	4,216	2,528	8,948	3,082	4,481	639	2,400	3,577
Break-even Price (P/kg)	3.15	3.02	1.63	1.65	2.48	2.19	2.27	2.75	1.88	2.60	2.61	2.29
DIFFERENCE BETWEEN SCENARIOS (Off-farm Returns Less Farm Gate Returns) 6/	856	318	(206)	(216)	1,547	983	1,370	-437	371	274	90	416

1/ Based on actual costs, i.e., these include imputed costs for family labor.

2/ Two yellow corn and two white corn farmers were interviewed per barangay for this costs and returns analysis.

Thus, figures in each column for YC and WC indicate the average for 2 farmers.

3/ Detailed comparative costs of production per municipality/barangay and type of corn planted are shown in Appendix 2B. Comparative costs of labor at research sites are in Appendix 2B.

4/ The number of asterisks indicates the number of farmers who actually sold in the specified area and their actual price/s received. Two asterisks indicates the average price of two farmers who actually sold at the same location. Note that sample farmers in New Visayas (YG & WC) and Pualas (YC) all sold only at farmgate. Further, farmgate prices in Ane-I are higher than the price at poblacion because Ane-I is nearer to CDO than the latter.

5/ Trucking costs from sample barangays to the municipality's poblacion and CDO are in Table 7.1, Chapter 7. No transportation cost means corn was picked-up by buyer in the farm.

6/ Figures in parenthesis indicate losses when the farmer/s sold outside the barangay, despite lower prices in the actual sales site. The credit-marketing tie-up arrangement between farmer and buyer could be the main reason.

1/
Table 6.4b Farmers in Kallilangan, Wao and Average for the 5 Municipalities

MUNICIPALITY	KALILANGAN					WAO				AVERAGE FOR THE FIVE MUNICIPALITIES COVERED		
	BARANGAY	KIBANING		LAMPANUSAN		MILAYA		KATUTUNGAN				
TYPE OF CORN USED	Yellow Corn	White Corn	Yellow Corn	White Corn								
ITEMS FOR ANALYSIS												
YIELD (kg/ha)	6,076	2,103	3,658	3,133	2,006	2,433	4,822	2,566	3,444	2,067		
SCENARIO 1: FARMERS RETURNS AT FARMGATE												
Farmgate (Brgy) Price (P)	3.45	3.48	3.20	3.25	3.20	3.15	3.30	3.30	3.44	3.43		
Farmgate Gross Return (P)	20,969	7,218	11,706	10,182	6,707	7,664	15,913	9,788	11,853	7,074		
Less: Production Cost (P) 2/	8,766	5,218	8,633	6,265	6,369	4,326	8,324	5,261	7,128	4,468		
Net Return at Farmgate (P)	12,203	2,100	3,073	3,917	308	3,338	7,089	4,527	4,725	2,606		
Break-even Price (P/kg)	1.44	2.48	2.36	2.00	3.04	1.78	1.83	1.77	2.25	2.23		
SCENARIO 2: FARMER'S RETURNS AT PLACE ACTUALLY SOLD 3/												
Price at Actual Place Sold												
- Barangay (P)		3.35 *							3.55	3.53		
- Poblacion (Municipality) (P)		3.65 *					3.30 *	3.45 **	3.66	3.77		
- Cagayan de Oro (P)	4.08 **		4.35 **	4.08 **	4.35 *		4.30 *	4.25 **	4.27	4.23		
Transportation Cost to Actual Place/s Sold (P) 4/	2,635	0	1,430	450	1,014	706	1,414	1,547	743	320		
Actual Gross Return (P)	24,786	7,261	15,912	12,783	8,028	8,394	18,906	12,006	13,508	7,566		
Less: Production + Marketing Costs	11,452	5,218	10,063	6,715	7,383	5,032	10,238	6,008	7,871	4,727		
Actual Net Return at Sales Point (P)	13,334	2,143	5,849	6,068	645	3,362	8,668	5,998	5,637	3,227		
Break-even Price (P/kg)	1.89	2.48	2.75	2.14	3.62	2.07	2.12	2.30	2.43	2.35		
DIFFERENCE BETWEEN SCENARIOS (Off-farm Returns Less Farm Gate Returns)	1,131	43	2,778	2,151	307	24	1,479	1,271	872	661		

1/ Two yellow corn and two white corn farmers were interviewed per barangay for this costs and returns analysis.

Thus, figures in each column for YC and WC indicate the average for 2 farmers.

2/ Detailed comparative costs of production per municipality/barangay and type of corn planted are shown in Appendix 29. Comparative costs of labor at research sites are in Appendix 28.

3/ The number of asterisks indicates the number of farmers who actually sold in the specified area and their actual price/s received. Two asterisks indicates the average price of two farmers who actually sold at the same location. Note that sample farmers in New Visayas (YC & WC) and Pualas (YC) all sold only at farmgate. Further, farmgate prices in Ane-i are higher than the price at poblacion because Ane-i is nearer to CDO than the latter.

4/ Trucking costs from sample barangays to the municipality's poblacion and CDO are in Table 7.1, Chapter 7. No transportation cost means corn was picked-up by buyer from the farm.

Source: Farmer Interviews

Table 6.5 Post Harvest and Marketing Costs per Activity from Four Supply sites to Cebu Port, First Cropping Season, 1989. 1/

MARKETING PARTICIPANTS	Post Harvest and Marketing Activities	LOCATIONS					
		CDO	Malaybalay	Don Carlos	Kallangan	Wao	
I FARMERS	A. Cost Per Activity/Material						
	1. Hauling 2/						
	a. Loading		0.01	0.01	0.01	0.01	
	b. Unloading		0.01	0.01	0.01	0.01	
	c. Hauling cost		0.06	0.13	0.17	0.25	
	2. Shelling						
	a. Shelling fee		0.08	0.05	0.04	0.08	
	b. Labor		0.03	0.03	0.03	0.03	
	3. Drying (include bagging & piling)						
	a. Drying fee 3/		0.03	0.05	0.02	0.05	
	b. Labor in drying		0.03	0.03	0.03	0.03	
	4. Sack Depreciation 4/		0.03	0.03	0.03	0.03	
	Total Farmer Pre-marketing Cost			0.25	0.34	0.34	0.49
	II MUNICIPAL/PROVINCIAL TRADERS	A. Buying Costs:					
1. Unloading			0.01	0.01	0.01	0.01	
2. Sculling/Pouring out			0.01	0.01	0.01	0.01	
3. Drivers' Commission			0.07 5/1	6/	0.10	0.10	
B. Selling Costs:							
1. Rebagging/Sewing			0.01	0.01	0.01	0.01	
2. Loading			0.01	0.01	0.01	0.01	
3. Transport Cost			0.16	0.22	0.40	0.50	
4. Sack Depreciation			0.03	0.03	0.03	0.03	
Total Traders' Costs up to CDO			0.30	0.29	0.57	0.67	
III CDO TRADER-SHIPPERS	TOTAL COSTS TO CDO		0.56	0.63	0.91	1.16	
	A. Buying Costs:						
	1. Canvassers' commissions	0.04					
	2. Drivers' commissions	0.01					
	3. Unloading/Pouring out	0.01					
	4. Storage (holding) cost	0.02					
	B. Shipping/Selling Costs:						
	1. Rebagging	0.01					
	2. Palletizing	0.01					
	3. Loading	0.01					
	4. Trucking-CDO (warehouse to port)	0.01					
	5. Arrastre & Sievedoring(CDO & Cebu)	0.05					
	6. Freight	0.09					
	7. Shrinkage	0.12					
8. Sack Depreciation	0.05						
TOTAL TRADER-SHIPPERS' COST TO CEBU		0.43					

1/ Shrinkage due to change in moisture content and pilferage at Cebu port were not included and may change cost substantially. Bank interests and trader's margin were also not included.

2/ Farm to Municipal/Provincial Traders.

3/ Solar driers

4/ The cost of bags is divided by their three uses.

5/ May be reduced for succeeding trips of the driver.

6/ Not known

Source: Farmer, municipal/provincial trader, trader/shipper, and canvasser interviews.



BEST
AVAILABLE

Cebu-bound corn grains await loading in the port of Cagayan de Oro City.

The farmers' post harvest and marketing costs from the sample barangays ranged from P 0.28/kg - P 0.49/kg and were largely for transportation. In Kalilangan and Wao where roads are in poor condition, transport costs comprised half of the total farmer's marketing costs.

The municipal/provincial trader's marketing costs shows an even wider degree of variation by location from P 0.30/kg to P 0.67/kg. Transportation accounted for 50 to 75 percent of this trader's total marketing costs. The commission commonly given jeepney drivers or small truckers for bringing farmers to these buyers also added a substantial share to his costs. If this type of trader is integrated forward into shipping of corn, an additional P 0.18/kg would be needed for direct shipment to Cebu.

Transportation costs varied widely by mode and condition of farm-to-market roads. For instance, to use horses to haul corn down hilly areas costs P 0.16/kg for cobs of corn in the 2.5 km trip to the corn shellers' place in Katutungan, Wao. On a kilometer basis, the cost was P 0.64/kg. However, if a weapons carrier had been hired, the cost would have been P 0.05 per kg/kilometer. The owners of weapons carriers needed large loads to fill their trucks yet such volumes are usually found from farmers nearer the roadside.

The trader/shipper's visible costs from purchase to pier are noted in the cost table. The less visible but no less real include: a) pilferage at the Cebu port; b) numerous telephone and other communication costs for arranging shipping space, contacting potential buyers and follow-up on back-payments; c) interest costs for inventories and delayed payments for corn shipped; and d) well-noted "shrinkage" from various sources. The trader/shippers in CDO with trucks and backward integration to the supply areas can eliminate most CDO buying costs and some shipping related costs, such as rebagging, by buying and careful loading of their trucks in the supply areas. It should also be noted that "wet" corn may incur drying costs in CDO.

A more detailed analysis on the marketing costs from two supply locations, Aglayan (Malaybalay) and Milaya (Wao) to Cagayan de Oro and to Cebu and Manila is contained in Attachment E. The objective of that analysis is to determine the final cost of corn landed in Manila from Northern Mindanao using the government support price of P 3.90/kg and to compare that cost with the price of imported corn. That analysis of marketing costs includes other items such as shrinkage and bank interests based from estimates of a CDO trader/shipper.

2.2. Disposing Good Quality Corn versus Mixing It With Spoiled Corn Two scenarios are used to illustrate the basic trade-offs for traders who buy either spoiled or wet corn. Case I (Table 6.6) poses the question, "Can a trader afford to dump spoiled corn that his 'suki' farmer-creditor 'encouraged' him to buy?" Clearly dumping the corn, Option A, resulted in a loss of at least P 70 or a price of P 5.18/kg to break-even assuming no other costs. On the other hand, Option B, indicated the price of mixed spoiled and good corn could be as low as P 4.14/kg to break-even whereas P 4.80/kg during a "sellers market" earned profit of P 330, assuming no other costs. This profit would help the trader minimize credit losses due to the limited repayment by the "suki" creditor, at least until the next harvest season.

2.3. Drying Wet Corn versus Mixing It with Dry Corn Case II (Table 6.7) asks, "How much more does a trader benefit from mixing versus drying the corn?" A comparison of Options A and B indicates a slight advantage for drying either by the costly mechanical or cheaper solar dryer. However, what each costing does not show is the risk of a lower sales price during the time required for drying (usually critical during the rapid price drop in June-July), the rainy season weather which further extends drying and storage time, and the profit from rapid turn-over in trading. In other words, during a "sellers market", if one spends and receives P 100,000 plus a mark-up twice a week instead of once a week due to drying delays, profit is much higher. But in a "buyers market" where quality becomes important in order to find better buyers or to minimize incurring large "réseco", drying becomes much more important.

3. Costs and Comparative Advantage Between Millers in CDO and Cebu

Within the corn milling industry are critical questions related to the comparative advantage of corn millers located within the corn production areas compared to those in or near the demand areas. Data and insights collected during the RMA were organized to expand our understanding of this locational difference.

A comparison of the buying prices of white corn grain for corn millers in the three locations in August, 1989 show P 3.98/kg, P 4.24/kg and P 4.97/kg in Malaybalay, Cagayan de Oro and Cebu, respectively. Given that, the cost of grain constitutes the largest share or about 90 percent of grits cost. In Malaybalay and CDO, the cost of milling are similar, i.e., approximately P 35.00 per two sacks or 100 kgs of grain. Milling costs are slightly higher in Cebu due to higher labor and electricity costs. Assuming other costs are the same, Malaybalay grits should have cost approximately P 26/100 kgs of grits less than CDO while Cebu grits cost about P 78/100kgs more than CDO grits based on milling location (Table 6.8). The cost to ship grits from CDO to Cebu is estimated at P 15.39/100 kgs at current shipping rate. These data indicate that Mindanao millers have the comparative advantage of lower wages, lower cost and more dependable electricity, generally more timely access to grain and comparable milling recovery rates with Cebu millers. Likewise, the additional costs of shipping grain by sea from Mindanao to Cebu

Table 6.6 CASE 1: DUMP SPOILED CORN AND SELL ONLY GOOD QUALITY CORN (OPTION A)
VS. MIX AND SELL SPOILED WITH GOOD QUALITY CORN (OPTION B)

Given:	1. Spoiled Corn	2. Good Quality Corn
Quantity	100 kgs.	400 kgs.
Buying Price (i.e. a 50% difference between spoiled and good quality corn)	P 2.30/kg.	P 4.60/kg.
Buying Cost (100 kgs.xP2.30)	P 230.00	P 1,840.00
Total Buying Cost for 500 kgs. of Mixed Spoiled and Good Quality Corn		P2,070.00 =====
Cost and Return Analysis		
Options:		
	A. Dump Spoiled Corn and Sell only Good Quality Corn	B. Mix and Sell Spoiled Corn with Good Quality Corn
a. Volume	400 kgs.	500 kgs.
b. Selling Price (i.e. a premium of P0.20 for dry corn)	P 5.00/kg.	P 4.80/kg.
c. Gross Returns (a x b)	2,000.00	2,400.00
d. Total Buying Cost for 500 kgs. of Mixed Spoiled & Good Quality Corn (see above).	2,070.00	2,070.00
e. Net Profit [Loss] (c - d)	[70.00]	330
f. Break-even Price (d / a)	P 5.18/kg.	P 4.14/kg.
g. Added Return [Loss] (b - c)	[0.18]/kg.	P 0.66/kg.

Table 6.7 CASE 2: DRY WET CORN USING EITHER A MECHANICAL OR SOLAR DRYER AND SELL AT 14% MC (OPTION A) VS. MIX AND SELL WET AND DRY CORN GRAINS (OPTION B)

Given:	1. Wet Corn at 28% MC	2. Dry Corn at 14% MC
Quantity	100 kgs.	400 kgs.
Shrinkage loss when dried 1/	16%	
Weight due to shrinkage	86 kgs.	
Buying Price, i.e. a difference of 25%(P1.15) between wet and dry corn	P3.45/kg.	P4.60/kg.
Drying cost for mechanical dryer	P0.30	
Drying cost for solar dryer	P0.10	
Buying cost of grains		
1. (100 x P3.45)	P345.00	
2. (400 x P4.60)	-----	P1,840.00
Total Buying Cost of Wet Corn Plus Dry Corn Grains		P2,185.00
		=====

Cost and Return Analysis

Options:	A. Dry wet corn using either mechanical or solar dryer & sell at 14% MC	B. Mix and sell wet and dry corn grains
a. Volume	2/ 486 kgs.	500 kgs.
b. Selling Price (i.e. a premium of P0.20 for dry corn)	P 5.00/kg.	P 4.80/kg.
c. Gross Returns (a x b)	2,430.00	2,400.00
d. Total Buying Cost of Grains(see above)	2,185.00	2,185.00
e. Drying cost using mechanical dryer (86kgs. x P0.30)	26.00	
f. Drying cost using solar dryer (86kgs. x P0.10)	9.00	
g. Total Cost of Grains Using Mechanical Dryer (d + e)	2,211.00	
h. Total Cost of Grains Using Solar Dryer (d + f)	2,194.00	
i. Net Profit Using Mechanical Dryer (c - g)	219.00	
j. Net Profit Using Solar Dryer (c - h)	236.00	
k. Net Profit of Selling Mixed Wet and Dry Corn Grains (c - d)		215.00
l. Break-even Price Using Mechanical Dryer (g / a)	4.55/kg.	
m. Break-even Price Using Solar Dryer (h / a)	4.51/kg.	
n. Break-even Price of Selling Mixed Wet and Dry Corn Grains (d / a)		4.37/kg.
o. Added Return Using Mechanical Dryer (i / a)	0.45/kg.	
p. Added Return Using Solar Dryer (j / a)	0.49/kg.	
q. Added Return of Selling Mixed Wet and Dry Corn Grains (k / a)		0.43/kg.

1/ Computed based on a standard grain shrinkage table.

2/ Weight after grain shrinkage incurred when drying.

Table 6.8 Comparative Costs of Milling by Location
(per 100 kg), August 1989

Cost Items	LOCATION		
	Bukidnon	Cag. de Oro	Cebu
Buying price of grains 1/	P 3.98/kg	P 4.24/kg	P 4.97/kg
Cost of grains	398.00	424.00	497.00
Milling costs 2/	35.00	35.00	40.00
Bagging materials 3/	14.00	14.00	14.00
Total Cost of Grits	P 447.00	P 473.00	P 551.00

1/ Based on average buying prices of millers (August, 1989)

2/ Millers' estimate

3/ Two pieces of sacks at P 7.00/pc

Source: Millers interview

added substantially to the costs of Cebu millers (Table 6.8).

On the other hand, a broader comparison of the comparative advantage between the "supply site" CDO millers and other Mindanao millers, and the "demand site" Cebu millers based on factors relative to procurement, internal operations, sales strategies and competition that combines both an industry-wide and firm-related considerations indicate the following strong advantages for Cebu millers:

1) Cebu millers have access to several sources and grades of corn. They could buy wet, lower cost grain from Cagayan de Oro to mix with dry, higher priced grain from General Santos and Davao before milling. The benefits of alternative grain sources were to help ensure better quality, to bid down prices between the various sources and not to invest in drying floors or mechanical dryers because they can mix poorer and better quality to get "acceptable quality." On the other hand, Cagayan de Oro millers only procured locally and attempted to screen for dryer grain. However, since much wet corn is available during the rainy season's peak harvests, CDO millers have invested in solar and/or mechanical dryers. These dryers require additional time and costs for drying grain before milling. Likewise, due to seasonality of harvests, longer term inventories are maintained and high costs of capital are accrued by CDO millers:

2) Mindanao millers are relatively more vulnerable to serious crop production problems, such as the 1982-83 drought. The greater risks involved delayed repayments of substantial amounts of cash distributed to "suki" suppliers, the underutilization of large facilities and many employees without work. On the other hand, Cebu millers could procure from other locations or "wait out" the problem with limited overhead costs;

3) Mindanao millers have tied-up cash simultaneously various operations. These covered advances, larger inventories of yellow and white corn, deployment and maintenance of a fleet of old trucks, payments due for grain shipped to Manila buyers and delayed payments within the grits distribution system itself. If all went well, income came from several sources, but if the corn situation was problematic, the high cost of money was more strongly felt. On the other hand, Cebu millers have relatively minimal cash exposure well within their grits distribution system and smaller inventories;

4) The Mindanao millers' management time and expertise are scattered among several enterprises in addition to their grits distribution system. They therefore, have to rely more on their distributors in various locations who are involved in large distribution of grits. On the other hand, Cebu millers have second generation entrepreneurs taking over the family business who are quite attentive, skilled and responsive to finely tuned distribution networks. They adopt multiple strategies to provide better or cheaper services to retailers in the Visayas than competitors from Mindanao; and

5) Mindanao millers are farther from the Visayan Islands and do not have access to shipping services to those islands on as regular a basis as millers in Cebu. This access increases the competitive edge of Cebu millers who excel in their detailed understanding of the timing of demand for each large Visayan city, ability to retrieve and replace unsold grits, and inclusion of milling by-products as well as rice in their distribution channels for grits.

Chapter VII

INFRASTRUCTURE

The transport system bottlenecks increased the costs and inhibited the timely flow of corn from the supply areas to the transshipment port at Cagayan de Oro City and consequently, the same effects on the demand centers of Cebu and Manila. Delays in moving corn from the field to the market also led to price uncertainty and increased grain spoilage. The poor condition of most barangay roads is aggravated by the fact that the peak harvest season for corn normally coincides with the rainy season. Some farm-to-market roads were washed out during the rains while others had developed large potholes.

A critical main thoroughfare was the 77 kilometer national road from Wao, Lanao del Sur to Maramag, Bukidnon. This road has remained unpaved and usually caused frequent delays for trucks during the rainy season. The 14 antiquated wooden bridges along the Wao to Pangantucan road were often damaged by heavy trucks. This led to further delays whenever they had to be repaired.

The lack of sufficient trucks likewise constrained the flow of corn from the field to the market. Carabao or cow-drawn carts, sleds and horses still had to be used to transport corn from many interior barangays.

The shortage of shipping facilities for Cagayan de Oro trader/shippers meant the following: a) the inadequate tramping vessels available for trips to Cebu and Manila, b) the limited allocation of vans in the containerized vessels which were the only ships that regularly ply the CDO-Manila route, and c) the limited space in the breakbulk vessels that daily ply the CDO-Cebu route. The high incidence of corn pilferage at Cebu City port was reported by Cagayan de Oro shippers.

Post harvest facilities, particularly solar dryers, were critical for both farmers and traders. Solar dryers were less adequate in the interior barangays. Large traders used various types of mechanical dryers in addition to concrete pavements. The economic use of mechanical dryers seemed most beneficial for those within or nearest the large corn production areas.

Radio transceivers were most frequently used by large traders near the corn production areas to contact buyers in Cagayan de Oro City. Corn buyers and sellers, within Cagayan de Oro, Cebu and Manila often used telephones for procurement and sales negotiations as well as for arranging corn shipments.

Power services in the region were supplied by a hydroelectric plant which offered lower consumption rates compared to Cebu and Manila.

This chapter discusses the impacts of infrastructure on the corn commodity system, especially the road network, inter-island shipping, post harvest facilities, power and communications facilities.

A. Road Network

The conditions of roads and bridges and the mode and cost of transport at the research sites were analyzed to understand their impact on the performance of the corri commodity system.

1. Condition of Roads and Bridges

1.1. Cagayan de Oro to Wao National Road—The road network of the Northern Mindanao region is composed mainly of gravel and earth surfaces (91%) with very limited concrete or asphalt pavement. The 207 kilometers national road from Cagayan de Oro to Wao consists of 130 kilometers of concrete highway (Cagayan de Oro to Dologon, Maramag) before becoming a 77-kilometer section of gravel and earth-surfaced road. The gravel section of the road from Wao to the middle of Pangantucan has historically been the site of frequent truck stoppages whenever heavy rains occur during the July-August harvest period. The wheels of overloaded trucks sometimes sunk into soft spots in the road or slid into the ditch, especially on steep, sloping portions of the road. At other times truck stoppages occurred due to the collapse of or broken floor beams of dilapidated wooden bridges. The 14 wooden bridges along that route had rated carrying capacities of 5-10 MT which were well below the weight of the loaded trucks that frequently passed over them during peak harvest season.



In Pangantucan, a wooden bridge damaged by overloaded trucks is under repair.

The impact of poor roads and bridges from Wao to Pangantucan was especially severe during the July to August harvest season of 1989. During that period, the trucks filled with traders' corn would be stopped from 2 days to a week due to broken bridges or trucks mired in the mud. In fact, a stoppage of over 90 full trucks of corn was witnessed by the team during its August field work.

Broken bridges meant a detour down one bank, across the stream and up the opposite bank. The heavily loaded trucks managed to drive down to and across the stream but usually became stuck going up the other bank. Local laborers were hired to unload and reload many sacks in order for trucks to climb the opposite bank. Wao traders claimed they would pay from P 0.50 to P 1.00 per sack for moving those sacks on these occasions.

According to key informants, the Department of Public Works and Highways had earmarked a P 97 million budget for asphaltting the road and concretizing the bridges from Wao to Maramag. However, why that work has not begun still remains unclear.

1.2. Cagayan de Oro to Claveria Route The 45 km asphalt road from Cagayan de Oro to Claveria along the northeast edge of Misamis Oriental consists of 27 km of major highway along the level beach front before it branches 18 kms to the southeast and weaves back and forth up several kilometers of steep slopes to the rolling plateau above. The final 18-km access road has good asphalt except for the 1 1/2 to 2 kms of damaged road before reaching the Claveria poblacion. That road section is badly in need of immediate repair.

1.3. Farm-to-Market Barangay Roads Eight of the ten sample barangay roads leading to the town market centers were earth or gravel-surfaced. Exceptionally good barangay roads were found only in Aglayan (Malaybalay, Bukidnon), situated at the crossroad of the main highway and a major interior road; and in Ane-j (Claveria, Misamis Oriental), along the main asphalt road from CDO. Some earthen roads, like the one to Kibaning (Kalilangan, Bukidnon), were only passable by tractor and trail during the rainy season, whereas potholed gravel roads to New Visayas and Pualas (Don Carlos, Bukidnon) were just barely passable when rainfall was heavy. In sections of Wao, the farm-to-market roads were graveled with limestone. Graveling of selected barangay roads in Wao is being undertaken by the World Bank-assisted Second Rural Road Improvement Program.

2. Modes of Transport

2.1. Variations in Modes and Cost of Transport The modes and costs of transport from farm to assembly and market centers were determined by: a) type, distance, terrain and condition of the road; b) proximity to the poblacion; c) volume of corn to be sold; and d) availability of vehicles that ply the area (Figures 7.1 and 7.2). For interior fields in lower elevations accessed by narrow trails and rugged, earthen roads, the carabao/cow-drawn sleds and carts were used to access interior fields. In hilly areas, such as Katutungan in Wao or Pualas in Don Carlos, horses carried two sacks of corn down the hills along the winding paths, whereas weapons carriers of World War II vintage carried agricultural commodities down the roadways leading from interior barangays. However, these were few and easily bidden away by larger farmers in the roadside who harvested large volumes. Other modes of transport to and from interior barangays were jeepneys and tricycles (i.e., motorcycles with side attachments). In roadside barangays, large farmers and traders usually used wheeler trucks that held 10-12 tons or

Figure 7.1 Distances From Cagayan de Oro and Mode of Transportation Within The Research Sites

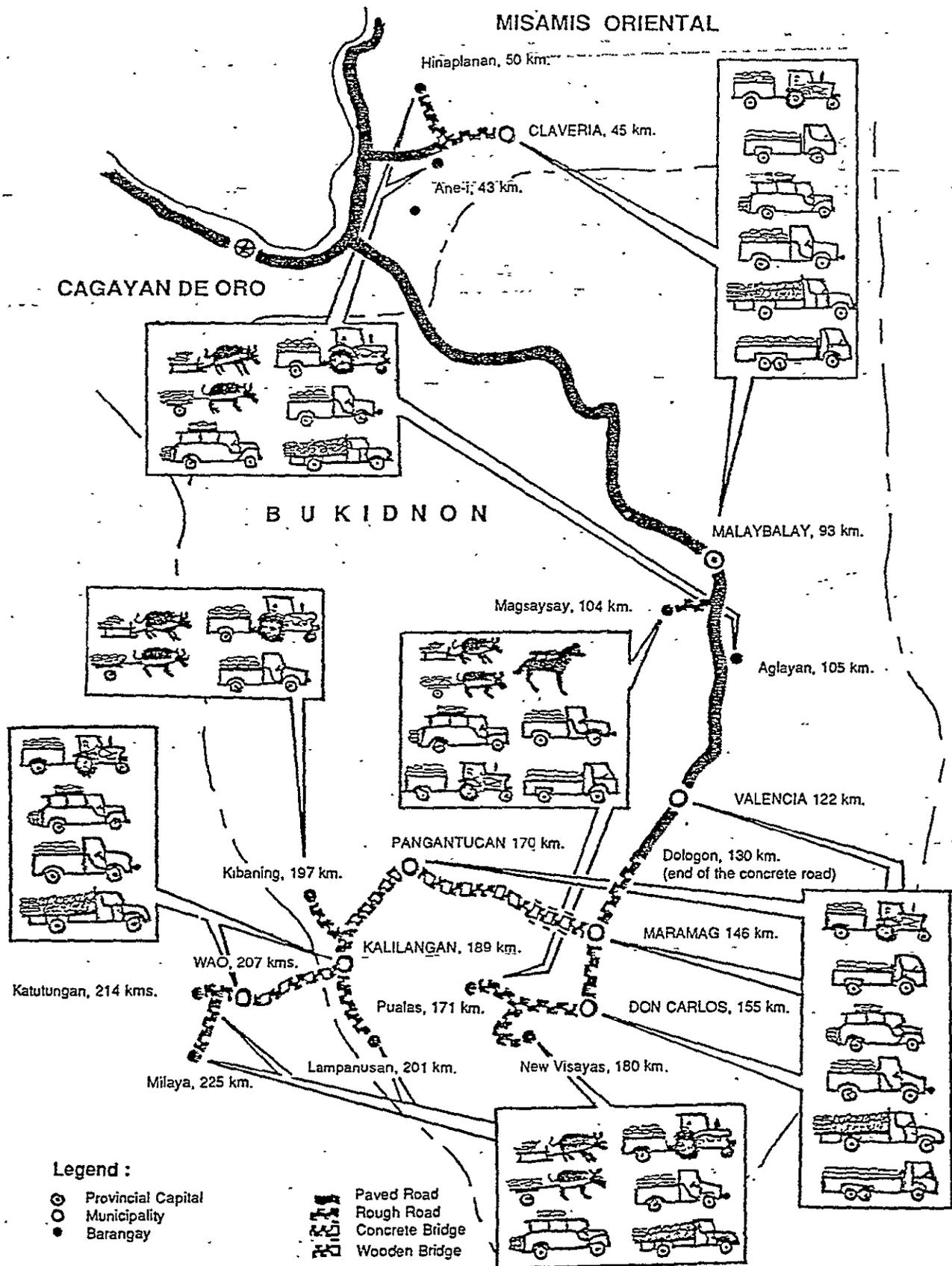
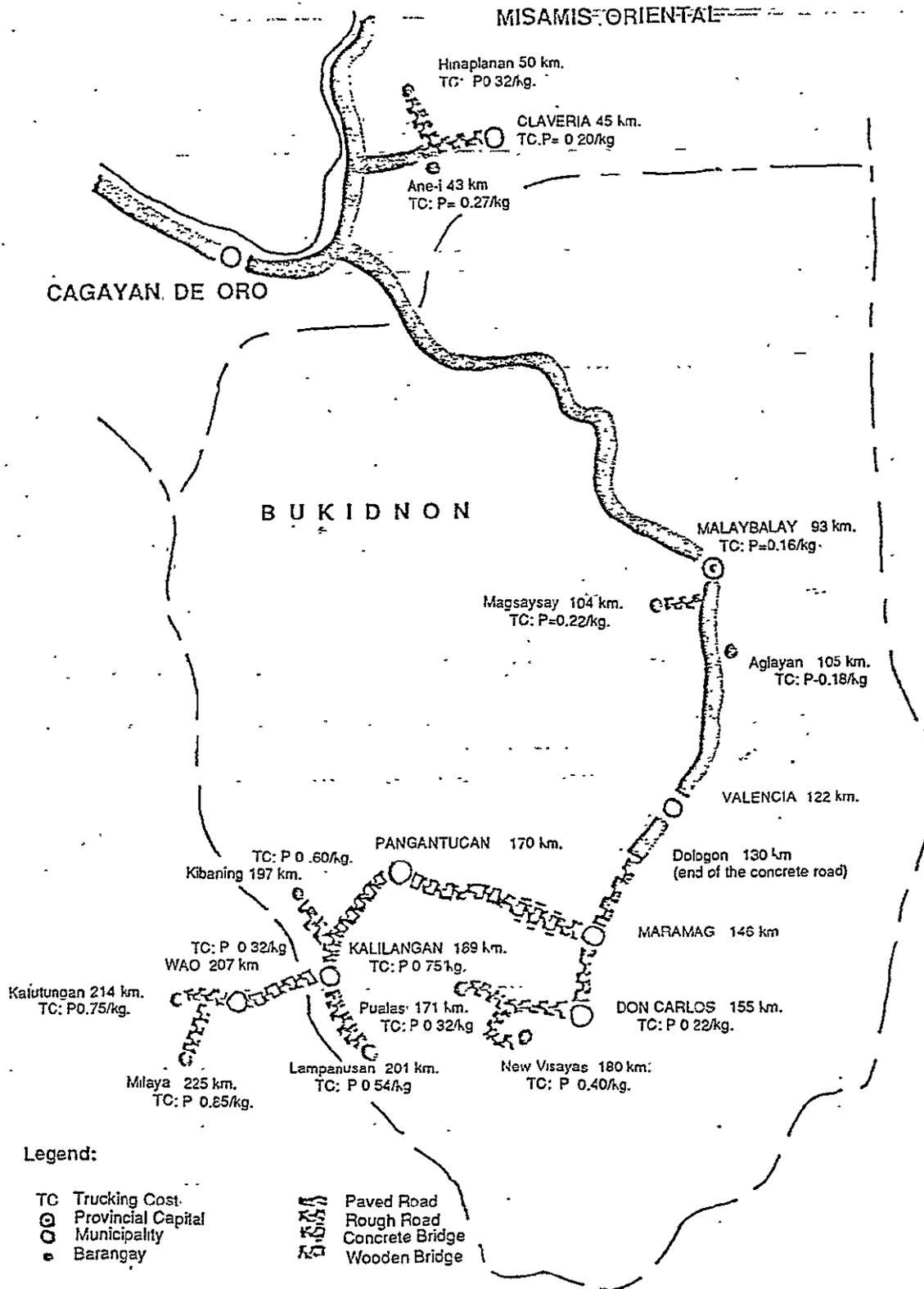
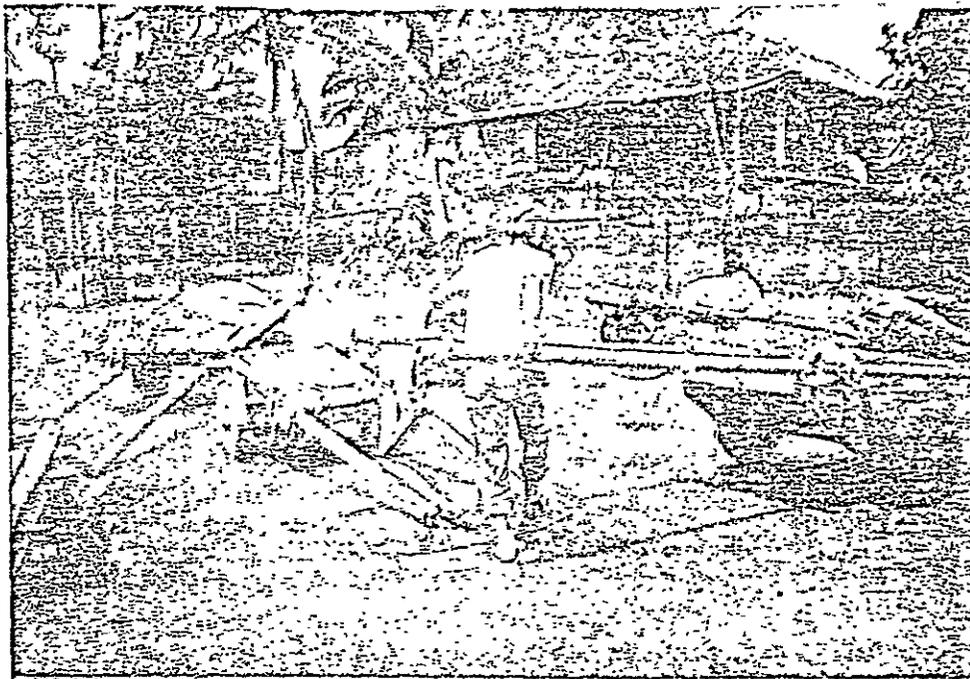


Figure 7.2 Trucking Costs Of Corn From Research Sites to Cagayan de Oro, First-Cropping Season, 1989 1/



1/ Based from interviews of sample farmers and traders.



Carts provide the only means of transporting corn from the interior barangay to the trader.

10-wheelers with 20 to 24-ton capacity to transport their corn, especially if sold to Cagayan de Oro City. However, in areas such as Kalilangan and Wao, only 6-wheeler trucks could be used due to the poor condition of roads and bridges in that area. Appendix 30a shows the number of registered trucking services for rice and corn in Bukidnon by municipality.

2.2. Impacts on Corn Prices Corn not locally consumed was usually hauled to Cagayan de Oro, the major transshipment center for corn in the region. Consequently, the greater the distance of the barangay and municipal traders from Cagayan de Oro, the greater the trucking costs and, accordingly, the lower the prices received by farmers in those areas. The variations in the trucking costs accounted for much of the price differences between the sample barangays and municipalities (Table 7.1).

Lower speeds were proxies for road conditions. For instance, when one travels south from Cagayan de Oro during the rainy season, one maintains an average speed of about 60 km/hr to Don Carlos, although the last 25 km would be slower due to the gravel road. However, that average speed would drop sharply to 40 km/hr on the road to Kalilangan or more than 30 km/hr to Wao assuming that the bridges and roads to Wao are passable).

BEST
AVAILABLE

7234
 11/11/89
 11/11/89

Table 7.1 Distance, Travel Time, and Trucking Cost for Corn Grain Transported from Sample Sites to Cagayan de Oro City, First Cropping Season, 1989

SAMPLE MUNICIPALITIES/ BARANGAYS 1/	Distance from CDO	Distance from the Nearest Paved Road 2/	Travel Time 3/	Average Speed	Trucking Cost
	(Km.)	(Km.)	(Hr.)	(Km./Hr.)	(P/Kg.)
CLAVERIA	45	5	0.93	48	0.20
Hinaplanan	50	10	1.10	45	0.32
Anc-i	43	3	0.85	51	0.27
MALAYBALAY 4/	93	-	1.53	61	0.16
Magsaysay	104	4	1.87	56	0.22
Aglayan 4/	105	-	1.78	59	0.18
DON CARLOS	155	25	2.53	61	0.22
New Visayas	180	50	3.45	52	0.40
Pualas	171	41	2.90	59	0.32
KALILANGAN	189	59	4.48	42	0.40
Kibaning	197	67	4.98	40	0.60
Lampanusan	201	71	4.88	41	0.54
WAO	207	77	5.52	38	0.50
Milaya	225	95	6.32	36	0.85
Katutungan	214	84	5.72	37	0.75

1/ Computed from the center of the poblacion (municipality) or barangay proper.

2/ The concrete/asphalt road from CDO going northeast to Claveria poblacion covered 45 km. while going south to Bukidnon Province covered 130 km. ending at Dologon, Maramag.

3/ Travel time is based on jeepney speed on a typical day during the rainy season.

4/ These places lie along the concrete national road.

Source: Interviews of farmers, traders, and truckers.

B. Shipping Patterns

Cagayan de Oro City has a national port which is the focal point of domestic and foreign trade for the region. The growth of the port into an advanced complex to serve foreign vessels was part of the World Bank financed Phases I and II Cagayan de Oro Port Development Project which was begun in 1977 and completed in 1986. The port leads in the entire Mindanao in terms of facilities, equipment and trade.^{2/}

1. Port and Shipping Facilities

To date, seven shipping lines operate in the port, all members of the Conference of Inter-island Ship-owners and Operators (CISO). The types of vessels plying the Cagayan de Oro and other ports include the "roro" (Roll-on Roll-off) type, conventional (container-passenger), container, and tramping vessels. Two arrastre and stevedoring companies serves the port. (A separate report on "Shipping" is contained in Attachment F which gives a more detailed picture of shipping facilities and operations related to corn).

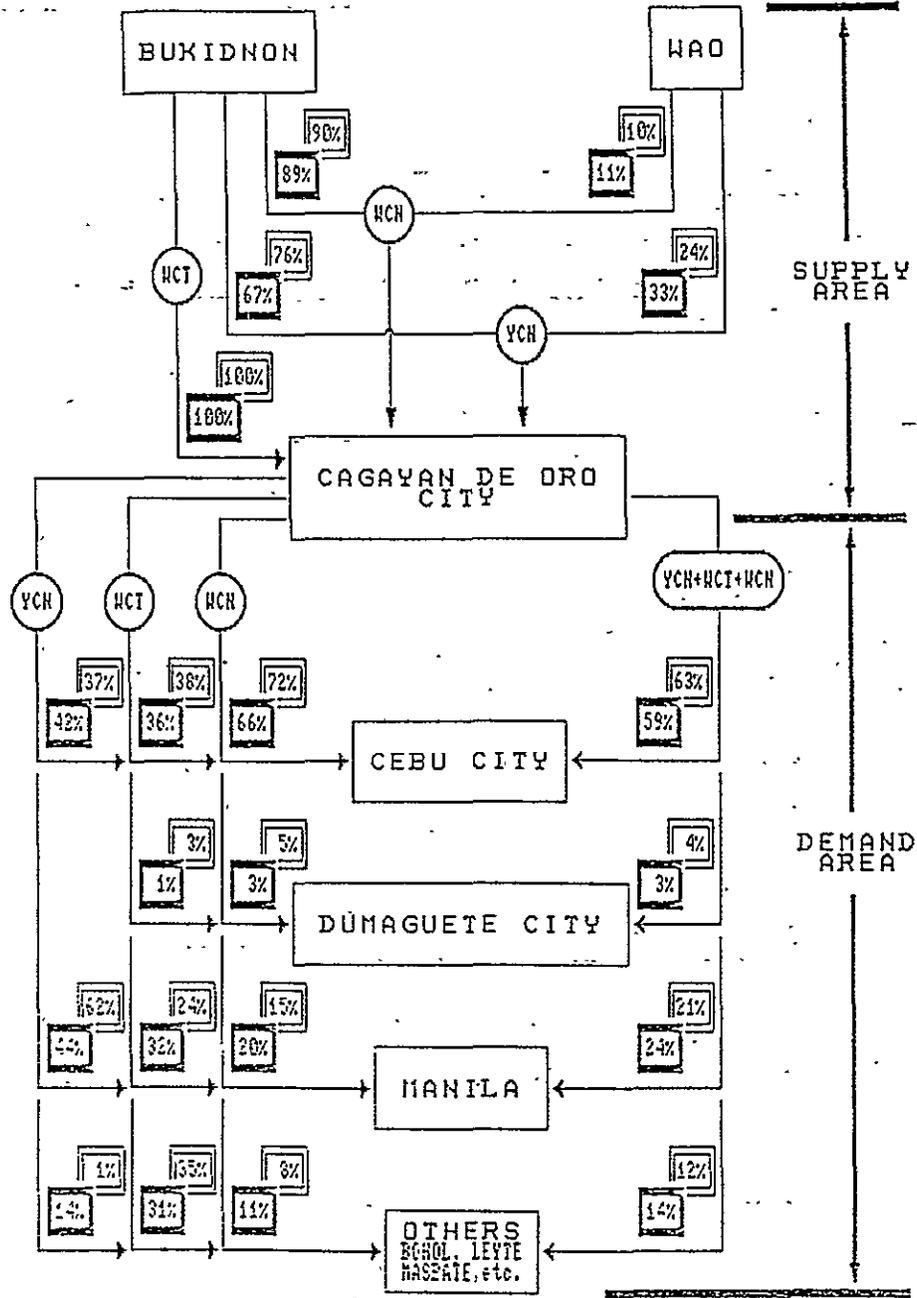
2. Corn Transshipment

2.1. Destination Corn in Cagayan de Oro City is mostly shipped to Cebu (about 61%) and to Manila (about 22.5%), based on 1988 to 1989 data (Figure 7.3). Each day, two cargo-passenger vessels ply the route to and from Cebu with a potential capacity of up to 10,000 bags per trip per vessel. Cagayan de Oro has a competitive edge over General Santos (South Cotabato, Region XI) in terms of frequency of vessels to transport corn as ships from General Santos go to Cebu only once a week. For trips from Cagayan de Oro to Manila, only container and container-passenger vessels ply that route, once or twice a week. Hence, the proximity of Cagayan de Oro City to Cebu City and the large number and frequency of vessels that serve that route were the main factors for Cebu becoming the region's main market for corn. The type of vessels, their number, Gross Registered Tonnage (GRT), routes and frequency of trips that call on Cagayan de Oro City port are shown in Table 7.2.

2.2. Seasonal Patterns of Volume Shipped During the harvest months from December to January and from August to September, 1989, corn comprised about half of the total volume of cargo shipped out of the region (a range from 49% to 57%). Accordingly, during the lean months from April to July, significant percentage decreases were registered on the share of corn in the total outbound cargoes (a range of 24% to 43%). Figure 7.4 shows these volume trends which reflect the shippers' competition for allocations of bottom space, particularly during the peak of the first cropping season.

^{2/} Ports in the Philippines. "Port of Cagayan de Oro: Golden Gate into Southern Philippines". Manila Chronicle, October, 1989.

Figure 7.3 Flow of Corn Commodities from Supply Areas through Cagayan de Oro to Demand Areas (1988 & 1989)



LEGEND:
 [Double-bordered box] - 1988 Data
 [Single-bordered box] - 1989 Data

Source: PFA

Table 7.2 Types, Number, GRT, Routes and Corn Capacity of Vessels
Calling on Cagayan de Oro City Port, 1989

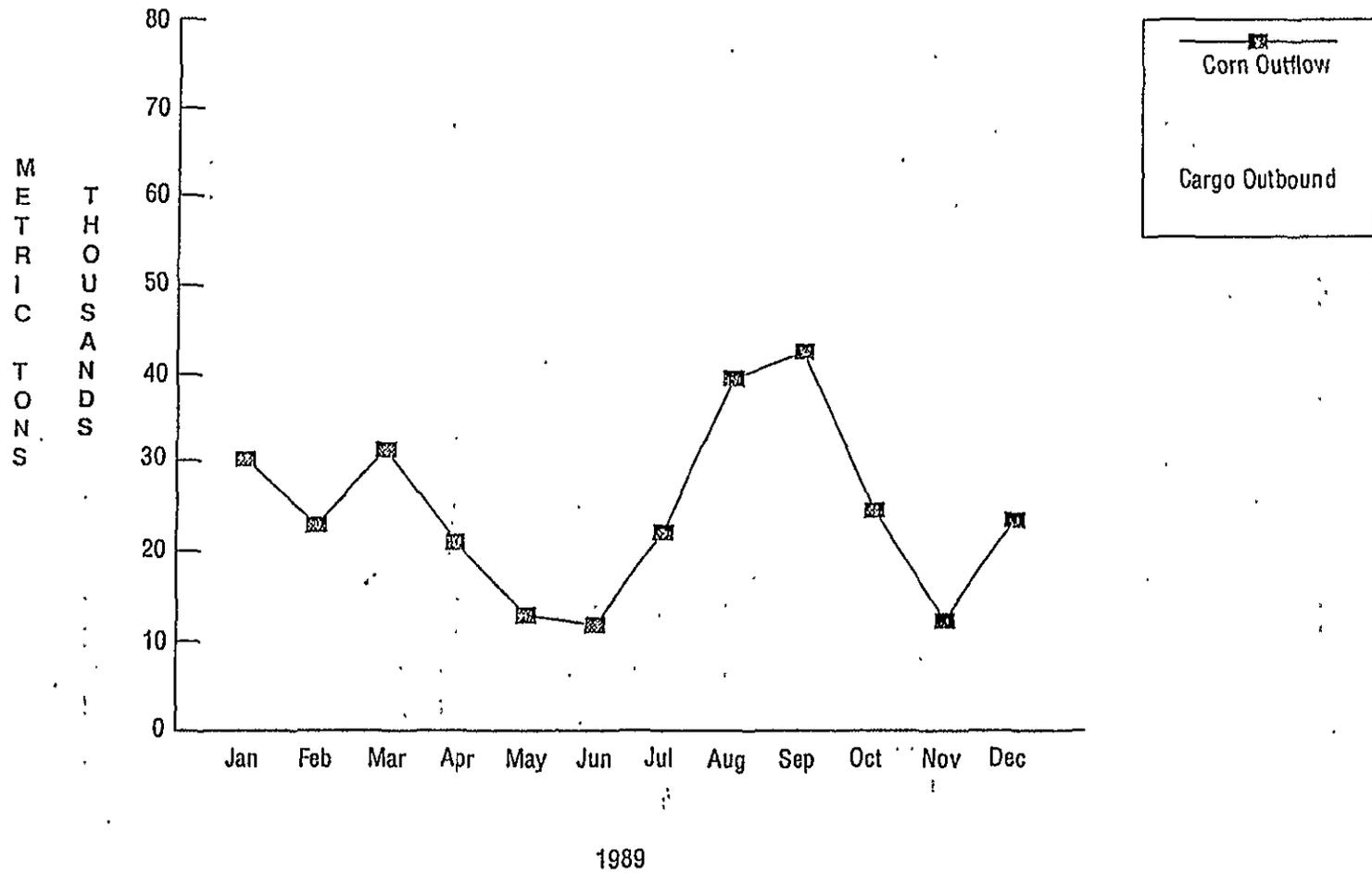
Type of Vessel	Description	No.	GRT Range	Maximum Corn Capacity	Routes	Frequency
			(MT)	(bags)		
Roll On, Roll Off	Cargo-Passenger Vessel	10	640-7910	6000-10000	CDO-Cebu-CDO CDO-Iloilo-Manila-Iloilo-CDO CDO-Manila CDO-Cebu-CDO-Tagbilaran-CDO	Daily Once a week Once a week Every other day
Conventional	Cargo-Passenger Vessel	2	880-920	2000	CDO-Cebu-CDO CDO-Benoni-Cebu-CDO	Every other day 3 times a week
Container	Cargo Vessel	6	1000-4200	(30% of the total vans loaded) 1/	CDO-Manila-CDO CDO-Manila-Iligan-Ozamis-CDO CDO-Cebu-Manila-Cebu-CDO	Once a week Once a week Once a week
Tramping 2/	Cargo Vessel					Non-scheduled

1/ About thirty percent of the total vans loaded contained corn, at 18 tons capacity per 20 footer van or 360 sacks in fifty kilogram bags.

2/ These vessels have no regular schedule and are time, trip or bareboat (hiring the entire boat) chartered.

Source: Gold City Integrated Port Service (INPORT), Philippine Ports Authority - CDO & Shipping line representatives.

FIGURE 7.4 VOLUME OF CORN OUTFLOW VS. VOLUME OF DOMESTIC OUTBOUND CARGO
IN CAGAYAN DE ORO PORT, 1989



2.3. Carro Handling In 1988, only 17% of the corn shipped was loaded on container vessels. Thus, the manual handling for non-containerized cargoes, either in bulk, breakbulk or palletized has remained the basic types of operation. An official from the Region X Philippine Ports Authority said that there is a possibility for introducing bulk handling within the existing port but, according to him, this venture would need big investors considering the costs to construct "suction" facilities at the receiving ports.

Another innovation, i.e., the strap method for palletizing sacks of corn, was once trial-tested by an entrepreneur as a substitute for wooden pallets. Despite the efficiency of this cargo handling method, problems cropped up which restrained its further use. This entrepreneur was not able to solve the sabotage of the straps by some "unscrupulous" persons at the port and the lack of a cheap and dependable supply of new straps.

3. Conditions at Cebu City Port

The high incidence of pilferage at Cebu City port has continued to be a frequently cited serious problem for Cagayan de Oro shippers who repeatedly incurred losses. This was due to the unregulated entry of persons inside the port area. Losses ranged from 2 to 5 kilos per bag. To begin to address this problem, the PPA office at Cebu created a Terminal Management Advisory Council with representatives from the government such as Coast Guard, Bureau of Customs, Department of Agriculture and from the private sector composed of cargo handling contractors and shipping lines. However, port users, such as Mindanao traders, who actually suffer the losses under the current sales arrangements were inadequately represented.

C. Post Harvest Facilities

While post harvest facilities owned by the different types of marketing participants were discussed in Chapter V, this section focuses on the types of post harvest technologies that merit greater attention, namely dryers, shellers and storage facilities.

1. Dryers

1.1. Solar Dryers Solar dryers meant flat or rippled concrete floors exposed to the sun. In the barangays and "poblacions", solar dryers were usually owned and used by traders. "Multi-purpose" pavements or basketball courts located on public property were usually used as "public" solar dryers by farmers with barangay officials collecting user fees.

In Wao and Kalilangan, solar dryers were more expensive to construct because the supply of sand and gravel had to be hauled 70-80 kms from sources in Valencia. The cost per cubic meter of sand and/or gravel delivered from Valencia to this area ranged from P 400 to P 500. Thus few could afford to build such dryers.

In other areas, farmer cooperatives had built their own solar dryers. For instance in Anei, Claveria, a local farmers' association considered constructing a solar dryer together with a trader who owns a well located parcel of land. Generally, both farmers and traders cited the availability of a solar dryer as an important way for improving and/or expanding their operations.

1.2. Mechanical Dryers Only the large traders and big corn millers with substantial financial resources owned mechanical dryers. These entrepreneurs were mostly located in Cagayan de Oro City, Bukidnon and Wao. The two main types of mechanical dryer found in the region were those originally designed to dry "seed corn" and the commercial corn dryers. Commercial dryers often handled over 20 MT/hour. Several key characteristics of mechanical dryers are noted in Table 7.3. Of interest is the conversion of burners from use of petroleum products as fuel to local materials, such as corn cobs and wood. Likewise, worth noting is that the more efficient BERICO machines were over 20 years old and still functioning well with local design improvements. Among these, the box type appeared to be the most efficient and economical with its capacity to dry 72 metric tons of corn per 8-hour operation. In general, the economic use of mechanical dryers seemed most beneficial for those within or nearest the large corn production areas. In both Cagayan de Oro and Cebu, the high cost of operation and maintenance of mechanical dryers relative to solar dryers were cited by large traders and corn millers as factors which had limited or restrained their investment in these facilities.

2. Shellers

The two types were the large scale stationary sheller and the small traveling type. Both were usually powered by diesel engines. These were usually owned by municipal traders and corn millers. The volume of corn shelled by the farmer, trader, or corn miller was determined by the capacity of his drying facility. In general, shellers merit special attention as their number, capacity and efficiency were directly affected by the amount of foreign material in corn grain. In Bukidnon, two newly and one long-time, established sheller fabricators were doing thriving business. The older firm has sold shellers throughout the region. A total of 113 shellers were registered in Bukidnon, Appendix 30B.

In barangays without access to shellers, farmers with large harvests had to sell these as corn on the cob at about half the price of grain. Some large traders with shellers and corn cob burners for a mechanical dryer welcomed this form of corn. Access to shellers was critical in such interior barangays as Magsaysay, (Malaybalay) where the cost for shelling reached as high as P 1.00 per can of corn grain, or about P 0.10/kg as compared to the cost of P 0.06/kg in a nearby barangay.

3. Storage and Warehouses

Storage warehouses are important to those handling corn in large volumes and who have the financial resources to hold/store corn stocks for extended periods. The municipal, provincial and Cagayan de Oro traders, commercial corn millers, and large hog and poultry raisers had different warehouse capacities and level of funds to maintain an inventory. Based on 1985 NFA report, Bukidnon storage warehouses had a total capacity of 2.8 million bags or about 140 million kilograms, 54% of which were owned by NFA while the rest were owned by private traders. Appendix 30c shows the number and capacity of registered corn and rice

warehouses in Bukidnon by municipality. The location of NFA's warehouses within Region X and their capacities are shown in Appendix 31.

In terms of storage facilities, their number and capacity were not as critical a problem as the degree of corn spoilage observed within some big warehouses. With the rapid acquisition of corn during the peak harvest, one trader emptied sacks of unshelled corn on the floor of an inadequately ventilated cement block warehouse. This freshly harvested, very wet corn quickly began to rot or the kernels sprouted. No such problem was noted in other traders' warehouses with well-spaced, wooden slat sides. Clearly, storage losses varied by type of warehouse and the trader's ability to dry corn.



Adequately ventilated warehouses with well-spaced wooden slats prevent spoilage.

D. Communication

Communication facilities in Cagayan de Oro and Cebu City consist of telephone, telegraph, FAX, and other similar services. Telephones were most frequently used for procurement and sales negotiations as well as when searching for vessels to ship corn between Cagayan de Oro and Cebu sellers and buyers. However, between the corn suppliers in the production areas of Bukidnon and Misamis Oriental and the large traders/processors in Cagayan de Oro City, radio transceivers were most commonly used. In the "poblacions" of Malaybalay, Valencia, Don Carlos, Maramag and Kalilangan, most municipal traders were equipped with VHF radio transceivers for daily contacts with Cagayan de Oro buyers. Wao traders had serious difficulty in contacting buyers outside their municipality and thus relied on the returning truck drivers for information on price changes in Cagayan de Oro. The Department of Agriculture in Bukidnon has currently been disseminating price information via radio broadcasts.

E. Power

A hydroelectric plant managed by the National Power Corporation's Mindanao grid services Northern Mindanao with a relatively cheaper source of electrical power compared to Cebu and Manila. The 1,078 megawatts of electricity supplied to the whole province is expected to meet the demand of residential and industrial users in the next 5 to 10 years. In Cebu, corn millers complained of increased frequency of power shortages or unannounced power interruptions which hampered their operations. This condition erodes the Cebu milling industry's competitive position vis-a-vis Mindanao millers.

CHAPTER VIII

INSTITUTIONS AND POWER

The corn commodity system performs within a complex institutional environment that covers political, economic, and socio-cultural systems. By administration, these institutions can be broadly classified as national or local in scope. By sector, they are either government or private. In terms of the types of institutional support that they provide for the corn commodity system, the seven areas are: policy formulation and advocacy; regulation; technology research and development; training and extension; infrastructure; credit and guarantee funds; and market information.

The government has been directly involved in the corn marketing system through price support and supply stabilization schemes. The government lending schemes such as the rediscounting program, wholesale banking and guarantee system has intensified formal lending in the countryside. On the other hand, research and development efforts of the government face the challenge of greater utilization and commercialization of mature technologies.

Private institutions which affect corn consist of business organizations, research and management centers and private banks. Manila-based business associations are effective in articulating to the government their industry problems.

Local institutions at the regional, provincial and municipal levels concerned with corn also represent the government and private sectors. Apart from these, development or "grassroots" NGOs have proven credible and effective in human resources development targeted at small farmers.

This chapter identifies the specific functions or support services which various institutions perform related to the corn industry. It also presents some features of the "forces" or "powerful" groups within the corn system which affect its conduct and performance.

A. National Institutions

Both the government and the private sector at the national level have had a profound impact on the performance of the corn commodity system in Region X. These specific national institutions and their corresponding functions relative to the corn commodity system are shown in Appendix 32a - 32f.

1. Government Sector

The government considers corn an important economic and political crop such that it attempts to protect and promote the corn industry through policy formulation, regulation and provision of support services. Government institutions at the national level concerned with corn are composed of department line agencies, financing agencies, and research centers/state colleges and universities.

1.1. Department Agencies Among the government agencies, the Department of Agriculture (DA) exerts the strongest impact on corn production. Its main task consists of making corn farming profitable while supplying adequate amounts to various end-users of corn. The DA performs the following functions: a) policy formulation; b) regulation; c) production and post-harvest technology research; d) training and extension; e) credit facilitation; f) market information collection and dissemination; and g) empowerment of farmer groups. The corresponding offices, staff bureaus and attached agencies under the DA mandated with these functions are shown in Appendix 32a - 32b.

The National Food Authority (NFA), an attached agency of the DA, implements the government's policy of corn price and supply stabilization. The agency buys corn at a farm support price during the harvest season, maintains buffer stocks and releases/sells supplies to the end-users during lean months.¹ Inadequate funds for procurement and lack of vehicles to service distant farms hamper the NFA's ability to fully implement that mandate.

During the first cropping harvest season of 1989, NFA, for the first time, did not participate in corn trading. Prices of corn remained at levels well above the support price such that traders absorbed the corn harvested during that peak harvest period. Appendix 33 shows the negligible volume of NFA total corn procurement in August, 1989 as compared to that in 1987 and 1988.

NFA evaluates requests of the end-users to directly import corn during periods of supply shortage and gives the final authorization and allocation of the volume of corn to be imported for each of the requesting party. Prior to the change in government in 1986, the NFA had exclusive responsibility to import corn on behalf of the end-users. The agency also regulates the corn trading and milling business. Requirements for business applications are listed in Appendix 34.

Many areas impact on the corn commodity system which are not directly or exclusively within the DA's "turf." These areas are, for instance; agrarian reform; transportation and communication; credit; food technology; and agro-based cottage, small, medium and large industries. In order

¹ Government farm support price for corn was increased from P 2.90 to P 3.90/Kg in December, 1989. A scenario on the comparative cost of the landed price of corn from Region X to Manila given the new support price and the price of imported corn in Manila is presented in Attachment E.

to streamline coordination and consultation among government and private sector associations in agricultural policy formulation and program implementation, the DA has set-up a network of Agricultural and Fishery Councils at the national, regional, provincial and municipal levels. These are composed of representatives from these various institutions. In October, 1989, the Policy and Planning Group of the DA's central office drafted a framework for the Corn Development Plan which targets an inter-agency group to implement the proposed strategies.^{2/}

1.2. Financing Agencies/Agricultural Credit Policy Considering the inherent risks in agriculture, government financial agencies at the national level adopted specific policy measures to promote the viability of agricultural lending. The policy formulation and credit delivery systems among agricultural lending institutions were streamlined when the government created the Agricultural Credit Policy Council (ACPC), an attached agency of the Department of Agriculture. The ACPC conducts policy studies and proposes measures for a coherent government lending program.

a. Agricultural Rediscounting and Wholesale Lending Programs The Central Bank of the Philippines sets the policies and procedures for agricultural rediscounts to financial institutions in the regions or rural areas. These policy measures include the adoption of market interest rates to discourage subsidy-seeking behavior among agricultural borrowers. Government agricultural rediscounting programs available for on-lending to small and medium enterprises are the Agricultural Loan Fund (ALF) and the Industrial Guarantee and Loan Fund (IGLF). Another important government financial institution is the rehabilitated Development Bank of the Philippines. The DBP has recently intensified its wholesale lending operations in order to channel medium and long term funds to Participating Financial Institutions (PFIs) for on-lending to investment enterprise.

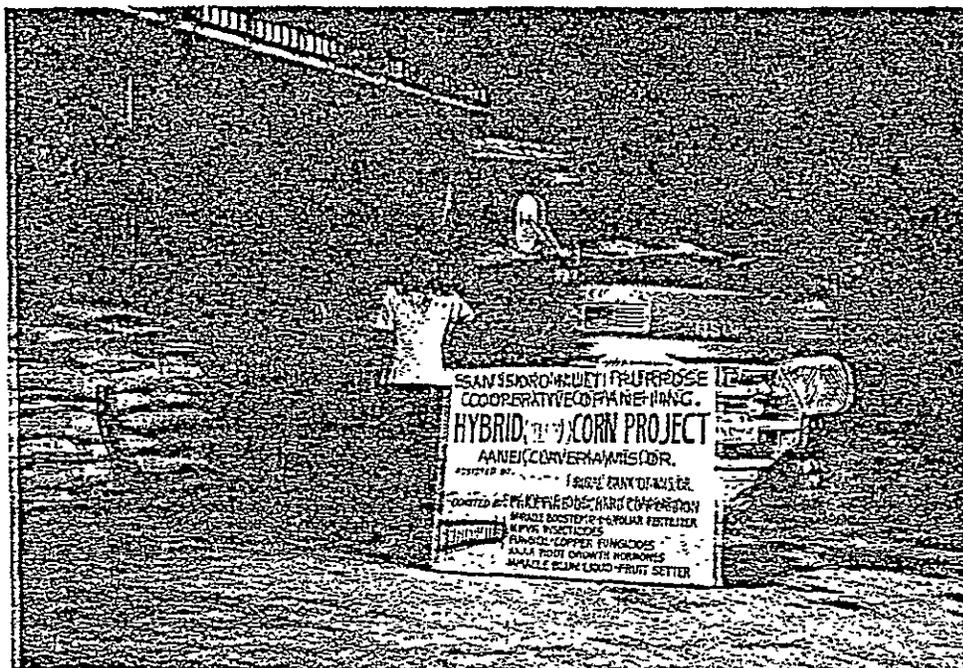
b. Loan Guarantee Funds The government devised a credit guarantee system to further boost formal lending in the countryside. As an "indirect" lending strategy, the guarantee system seeks to avoid pitfalls in the past wherein government supervised credit programs resulted in massive farm arrearages and the collapse of many rural banks when they depended heavily on agricultural discounts as bank resources.

The government guarantee facilities available are the Quedan Guarantee Fund (Quedan) and the Guarantee Fund for Small and Medium Enterprises (GFSME). These facilities can cover up to 80 percent the loan exposure of banks in agri-based small and medium enterprises. Quedan financing has many "takers" among individuals/firms engaged in the corn business.

^{2/} Institutional arrangements to implement the plan are currently finalized. Another policy paper from this office entitled "Impact of Rural Roads on Agricultural Productivity and Farm Incomes" prepared in September, 1989 show the direct correlation among these three variables in order to influence the DPWH's prioritization system for road projects in different regions.

Another government guarantee mechanism significant to corn is the crop insurance system. The Philippine Crop Insurance Corporation (PCIC) insures corn farmers' crops against losses due to infestation and adverse weather conditions. However, there might be a need for its policy-maker to re-examine the cropping time period specified in the insurance since farmers cannot claim for losses during slightly late planting periods.

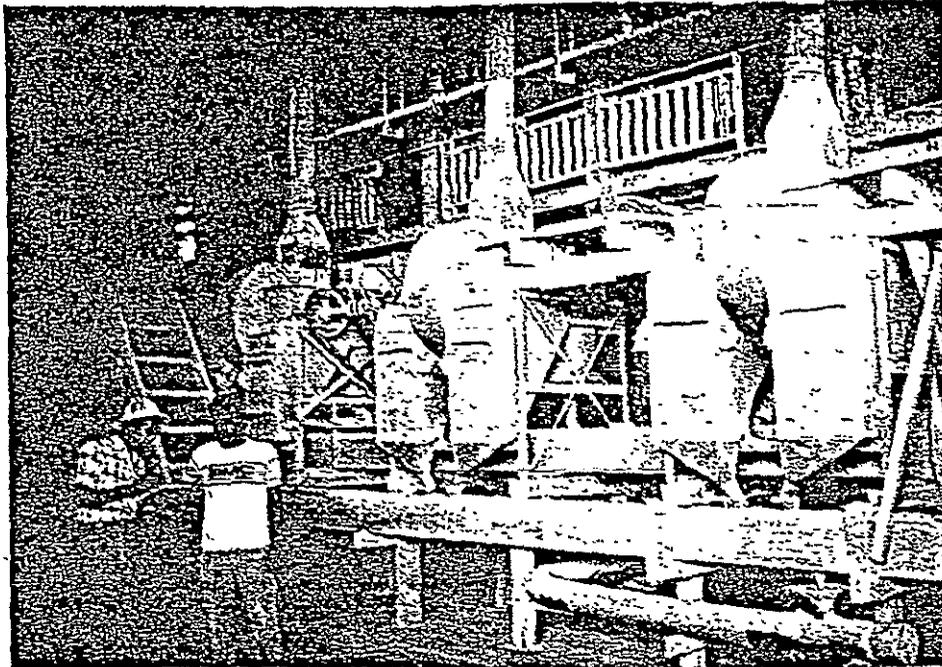
Farmer Cooperative Loans The Land Bank of the Philippines (LBP) similarly has intensified its farm lending program through Rural Financial Institutions (RFIs) such as rural banks, cooperative banks and private development banks. It has also stepped-up tapping of informal financial intermediaries, namely; farmer cooperatives and NGOs, as farm credit conduits.



A farmers' cooperative facilitates access to credit and provides post-harvest and marketing services.

1.3. Research and Academic Institutions The Philippine Council for Agricultural Resources Research and Development (PCARRD) is the government agency tasked to review and evaluate agricultural R & D programs and projects being implemented by member agencies of the National Agriculture and Resources Research and Development Network (NARRDN). The countrywide network is composed of 120 state colleges and universities (SCUs), experiment stations and research institutions of the DA, DENR and a number of private institutions. Under Phase I which covers the first two years of its Corporate Plan for 1990-2000, PCARRD aims to increase commercialization of technologies generated in traditional commodities, among which is corn. Experts in the R & D community agree that the problem of "unutilized research results" is one of the

major reasons for low farm productivity leading to the continuing poverty of farmers.^{3/}



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Much is still to be desired for the local corn milling technology to develop.

2. Private Sector

The private sector at the national level is a highly dynamic group which has significant influence on the corn industry. They consist of business organizations; research and management centers/associations, and private financing sources.

2.1. Business Organizations Manila-based business organizations are active in promoting private sector concerns. They effectively articulate to the government their industry problems as well as their reactions to certain government moves that hamper their business. The Philippine Chamber of Commerce and Industry (PCCI) is recognized by the government as the sole group representing the business sector. On the other hand, various organizations represent the medium and large feedmillers, hog raisers and poultry growers in Luzon. These are the Philippine Association of Feed Millers, Inc. (PAFMI), Philippine Association of Hog Raisers, Inc. (PAHRI), United Swine Producers Association (USPA), Philippine Poultry Industry Association (PPIA), and the Philippine Livestock and Poultry Development Foundation (PLPDF). The Confederation of Rice and Corn Millers Association (CONFED) based in Manila represents the interests of the corn millers and traders throughout the country. However, it is important to note that several of these associations do not voice the consensus of enterprises outside of Luzon as illustrated by the distribution of corn during the recent surge in imports.

^{3/} "The Aggie Scene," Manila Chronicle, November 28, 1989 and December 12, 1989.

2.2. Research and Management Centers/Associations Several private research centers and organizations in Manila conduct policy and R & D studies, training, and information dissemination programs. These include the Center for Research and Communication (CRC),^{4/} Technology and Livelihood Resource Center (TLRC), Agricultural Machineries Manufacturing and Distribution Association (AMMDA), and Philippine Inventors Society (PIS). They also publish technology, market research and development information for the business sector's use. Another private organization, the Management Association of the Philippines (MAP), launched in September, 1989 the "One Peso Per Kilo Program" corn program, in cooperation with the Department of Agriculture. The project aims, over a five-year period, to bring down the cost of producing corn in the country from the current levels of P 2.00 - P 2.50 per kilo to P 1.00 per kilo. Participants in the program are fertilizer and pesticide companies, seed companies, livestock and professional managers. The results of the program are currently being evaluated by the implementors.

2.3. Private Financing Sources Financial resources available from the private development and commercial banks for on-lending to agri-based enterprises are adequate, according to studies by the Agricultural Credit Policy Council. The government's lending schemes such as the rediscounting programs, wholesale banking and guarantee system have encouraged greater participation from private banks in lending to small and medium enterprises. However, actual access to those financial resources by agri-based enterprises, especially the small producers, are not within the scope of this study.

B. Local Institutions

Local institutions based at the regional, provincial, municipal and city levels, plan, implement, monitor and evaluate programs and projects in adherence to their "mother" institution's objectives, policies and guidelines. They form a local network of institutions under the umbrella of their central and usually Manila-based office. The government and private institutions within Region X and the two provinces selected for research sites, namely Bukidnon and Misamis Oriental directly affecting the corn commodity system are discussed below.

1. Government Sector

Government agencies, financing agencies, and research/academic institutions at the regional, provincial and municipal levels provide institutional support services related to the corn industry.

^{4/} The CRC Agribusiness Unit sponsored a consultation workshop on the topic "A Possible Legislation in Grains Post Harvest Facilities" in September 25, 1989 which was participated in by government and private sector representatives.

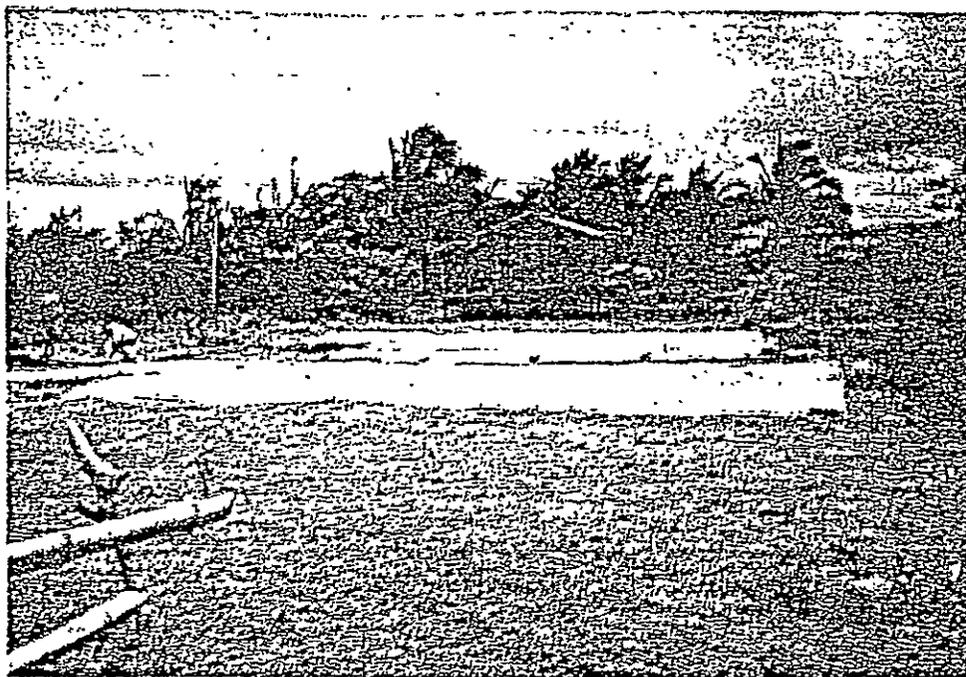
1.1. Department Agencies The Department of Agriculture's local network in Northern Mindanao is composed of a regional office, provincial and municipal offices, and a few attached agencies and staff bureaus. These offices conduct programs and projects involving corn-related technology R & D, training and extension, market information research and dissemination, credit and guarantee, as well as regulatory functions (Appendix 35a). Among the DA's staff bureaus based in Cagayan de Oro City, the Bureau of Soils renders/performs sampling analysis and land capability studies, the Bureau of Plant Industry (BPI) implements crop protection program for corn, while the Bureau of Agricultural Statistics (BAS) collects and analyzes production and marketing-related data. The attached agencies of the DA in the region consist of the National Food Authority (NFA) which buys corn at a government support price and licenses corn grains business firms, and the Fertilizer and Pesticide Authority (FPA), which monitors supply and prices of fertilizer and pesticides and licenses input dealers.

The Regional Agricultural and Fishery Council (RAFC) established by the DA actively promotes private sector participation in agricultural policy formulation and program implementation. The RAFC has become an important local medium for relaying to the government policy makers in Manila the viewpoints of the private sector and government groups in the region concerning specific policies and issues. The RAFC has its own local network of PAFCs (Provincial Agricultural and Fishery Councils) and MAFCs (Municipal Agricultural and Fishery Councils).

Other corn-related programs in which the DA regional and provincial offices are involved include: a) the Marketing Information System (MARIS) being implemented by the BAS and intended for a systematic collection and analysis of marketing-related data; b) the Corn Farm Demonstration Project; c) the Exploratory Research and Seed Exchange Program; and d) the Livelihood Enhancement for Agricultural Development (LEAD) Project which provides grants and banking linkages for livelihood projects, and established barangay solar dryers. Under the Seed Exchange Program which covers seven municipalities in Bukidnon, a bag of harvested seeds is exchanged for a bag of IPB seeds. According to the Provincial Agricultural Officer, the program has encountered difficulty in attracting many farmer cooperators in areas where the yellow hybrid seeds were more widely used.

1.2. Financing Agencies Government banks found in Cagayan de Oro City are the Philippine National Bank (PNB), the local offices of the Land Bank of the Philippines (LBP), and the Development Bank of the Philippines (DBP). The Land Bank in Malaybalay, Bukidnon has improved corn farmer cooperatives access to production and post-harvest loans in select sites such as those located in Aglayan, Don Carlos and Wao. In 1989, Land Bank's financing for corn farmers covered 1,000 has, of which 200 has covered Wao. Appendix 36 lists the requirements for crop loan application with the Land Bank of the Philippines.

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More financing can free the small farmer from his small scale of operations, reflected by the ingenious use of "amakan" mats for drying.

1.3. Research and Academic Institutions The Northern Mindanao Consortium for Agricultural Resources Research and Development (NOMCARRD), serves as the counterpart of PCARRD in the region. The Council is tasked to review and evaluate agricultural research undertaken in the region. In Musuan, Bukidnon, the Central Mindanao University (CMU) conducts corn production research in coordination with the Department of Agriculture and other institutions such as the University of Southern Mindanao in Cotabato. It conducted a socio-economic study of corn farmers in Bukidnon in 1987 and has proposed a subsequent corn marketing research on a limited scope. CMU directly assists corn farmers within the surrounding areas by providing soil sampling analysis at a minimal fee. In Claveria, the Misamis Oriental State College of Agriculture and Technology (MOSCAT) is engaged in research and technology transfer for corn and other agricultural crops.

Other government research institutions in the region currently or previously involved in corn-related studies include the Don Mariano Marcos Memorial Polytechnic State College (DMMMPSC) in Cagayan de Oro and the International Rice Research Institute station in Claveria, Misamis Oriental.

2. Private Sector

The private sector in Region X has been an important development catalyst in the agricultural sector. Several business organization, private research and academic institutions, financing agencies and community-based organizations composed of "grassroots" NGOs (non-government organizations), and farmer organizations are engaged in various activities related to corn.

2.1. Business Organizations An affiliate member of the PCCI and also an NGO, the Cagayan de Oro Chamber of Commerce and Industry Foundation, Inc. (Oro Chamber) provides a package of integrated services to promote business growth in the region. These include trade promotion, policy advocacy and research, management training services, and investment financing. The Oro Chamber's sponsorship of this Marketing Assessment Study for Corn is only one of its many projects centered on agri-business development.

Another private organization which is also based in Cagayan de Oro, the Oro Grains Association, aims to address the common problems of the rice and corn traders and millers in the region. However, the association has encountered difficulty in addressing problems related to the corn industry because of lack of support from its members.

2.2. Research and Academic Institutions The Xavier University located in Cagayan de Oro City leads in the pursuit of higher learning within the region. It has a college of agriculture linked on extension and training with the Southeast Asian Rural Social Leadership Institute (SEARSOLIN) which is also located within the school's agricultural complex. The University has conducted several researches related to corn. In Valencia, Bukidnon, an agriculture and forestry school, called the Mountain View College is being run by a religious group.

2.3. Financing Agencies Commercial banking services within the region are concentrated in Cagayan de Oro City. Approximately 24 private banks within CDO service various types of investors. The city's banking system has been cited as comparable to other major cities in the country such as Manila and Cebu.^{5/} In the countryside, rural banks found in many municipalities provide alternative sources of formal credit for agri-based enterprises.

3. Development NGOs

Development or "grassroots-oriented" non-government organizations differ from the business-oriented foundations and consultancy/management services type of NGOs. "Grassroots-oriented" NGOs primarily target rural areas, especially poverty groups for community organizing, mobilization and development. Their key approaches center on "participatory project planning and implementation", "value transformation", and "people empowerment." Among the noted development NGOs in the region are the Tawili Foundation, Muslim-Christian Agency for Rural Development (MUCARD), Philippine Partnership for the Development of Human Resources in Rural Areas (PHILDHRRA), and Hagdanan sa Pag-uswag Foundation.

In adding to their focus on human resources development, some development NGOs facilitate farmer groups' access to agricultural lending while others act as credit conduit themselves. They also provide marketing assistance services to farmer groups.

^{5/} Based from the Misamis Oriental Provincial Profile.

"Grassroots" NGOs have been often tapped by local and foreign donors in the planning and implementation of rural development projects because of their strong efforts towards project sustainability, i.e., ensuring project continuity even after external funding has terminated.

C. "Forces" Within the System

Within the broader economic, cultural and political environment are compelling "forces" which either enhance or impede the conduct and performance of the corn commodity system. Although a thorough analysis of these complex "forces" would require a separate kind and more intensive type of research, the study captured some of their salient aspects.

The unstable peace and order condition in some parts within the research sites visited has discouraged large farmers and local entrepreneurs from investing in certain fertile, agricultural areas. Incidences of theft of draft animals along the critical areas were mentioned. Barangay captains stressed that the high degree of emigration from certain "hot" spots in the barangay has made long-term development planning for their area difficult. A few large traders reported experiences in the region of grave risks involved in transporting or carrying valuable cash.

The conflict between policy-makers and the farmers and traders of Region X, particularly with respect to government decisions on corn importation was expressed during the field interviews and during the "Valencia Forum."^{5/} This conflict arise from the sharp plunge in corn prices in the region whenever the government approves corn importation. During the "Valencia Forum," the government, large traders, and farmer group representatives arrived at a consensus that "clear and consistent government policies" constitutes the foremost challenge confronting the corn industry.

^{5/} The mid-term results of the study were presented in a public forum held in Valencia, Bukidnon last Sept. 12, 1989.

Chapter IX

PROBLEMS AND CONSTRAINTS

The problems and constraints of the corn commodity system seriously impeded its ability to rapidly respond to changes in demand and supply. Yet such a response is essential for the profitability of all marketing participants, especially farmers. The RMA approach to identifying and diagnosing problems and constraints was as: a) expressed by the relevant types of participants at the production, distribution, processing and consumption levels; b) related to the vertical flows of the commodity, information and money through the system; and c) associated with the effectiveness and progressiveness of the system. The analysis from these three perspectives is effective in assessing the seriousness, impact and priority of problems.

Five major problems were identified in the corn commodity system of Northern Mindanao. Ranked according to their seriousness and impact, these are: 1) an acute shortage of yellow and white corn; 2) The inefficient transport system; 3) inadequate post harvest drying facilities; 4) insufficient market information; and 5) scarcity of working capital.

"Time period" is critical to the understanding of problems in a commodity system. This was particularly true during the research period in August, 1989 because the types of problems cited in this chapter occurred during that unusual period marked by very high prices. A substantial supply shortage relative to the surge in demand for corn by the livestock and starch manufacturing industries caused prices to continuously rise. Thus, farmers expressed less concern about the depressed prices during the peak harvest season.

Similarly, the high prices of corn resulted in the heavy traffic of trucks loaded with corn which exacerbated the poor condition of the roads and bridges. Consequently, the problem on insufficient transportation system ranked high among farmers and traders. The third major problem, inadequate post harvest facilities is also linked with the occurrence of the rainy season during the peak harvest period.

Lack of access to timely, accurate and reliable market information on the part of both farmers and interior traders was another problem uncovered in the study. The adverse effects caused by exaggerated rumors on corn shortages and pending imports also reflected the need for accurate marketing information.

The fifth major problem, the scarcity of working capital was cited as a constraint to increase productivity. The various types of marketing system participants attributed the problem to such factors as high cost of bank borrowing, slack business during certain periods, and inefficient financial planning.

The study has identified an agenda for action and research which provides potential opportunities for strengthening and stabilizing the corn commodity system of Northern Mindanao.

A. Problems Cited by Participants

Interviews with marketing system participants in the "demand" and "supply" research sites provided the problems presented in this section. These problems are organized according to how the respondents were classified within the production, distribution, processing and consumption levels of the commodity system. The conditions under which these problems most frequently occur, their probable causes and noted effects are discussed for each type of marketing system participant. Within each level, the ranking of problems is based on the frequency of respondents' answers. The detailed ranking of problems by each type of participant are shown in Appendices 37 - 45.

1. Production Level

Analysis of the problems at the production level focused on the sample farmers who planted either the yellow hybrid or white open pollinated varieties during the first cropping season in 1989. The four major "marketing problems" as expressed by these corn growers as a group were:

- * inadequate post harvest facilities, primarily drying floors;
- * inadequate working capital, mainly for operating costs;
- * price fluctuations/low prices;
- * poor transportation system; and
- * high cost of inputs (Table 9.1).



Inadequate drying facilities cause farmers to use portion of the highway as drying floor.

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Table 9.1 Problems Perceived by Sample Corn Farmers, 1989

PROBLEM	UNDER WHAT CONDITION	CAUSE	EFFECT
1. Inadequate post-harvest facilities, especially dryers	Primarily for yellow corn farmers during the 1-2 months of each peak harvest season, July to August	Small capacity for drying floors limit ability to dry entire crop in orderly fashion, particularly for the high yielding yellow corn - Need for drying comes all at once since harvest is during rainy season	Poor quality of corn resulting from high-moisture content - Incidence of corn spoilage is high during storage
2. Inadequate capital available to adequately finance operating cost, allow adoption of hybrid varieties, or expand production	- Primarily for poorer white corn farmers trying to grow hybrid varieties - During production period of corn, 1st and 2nd seasons, specifically for procurement of inputs, i.e., seeds, fertilizers, land preparation & weeding	- Lower yields for white corn result in lower income and less collateral for securing loan - Government assistance program are directed toward yellow-corn hybrid varieties - Poor repayment performance has reduced number of traders willing to lend to producers - High rate of interest makes repayment of loan and interest difficult at current prices	- Lower yields than possible under well-financed input system which allows optimal use of inputs (fertilizers, lime, pesticides, etc.) - Lack of adoption of hybrid varieties - Expansion of area devoted to corn production is limited or non-existent - Increased exposure of farmer to debt problems since financial institutions do not share risk
3. Fluctuating/low prices	- Mainly in peak harvest months of July to August	- Importation policies in the past impacted on prices of domestic corn - Wet corn is discounted - Financing charges are deducted from price when sold to financiers - Regulated buying or "stop-buying" on the part of traders in demand areas - Extra costs associated with transporting on poor road system (product damage) is deducted in form of lower price - Lack of adequate number of buyers to create competitive buying prices - Lack of adequate access to market information regarding price	- Low income levels to corn producers - Shift out of corn production to more profitable crops, such as sugarcane
4. Poor road transportation system	- Hauling of produce from farm to post harvest facilities and during selling of dried corn to demand area, CDO	- Unpaved roads from field to post-harvest facilities and on to market - Low capacity bridge - Heavy rains wash out roads - Lack of trucking capacity in rural areas for hauling products to market - Lack of individual farm volume to warrant truck load	- High incidence of spoiled corn due to slow trans-out - Exceptionally high cost of transport for small farmers volume - Lower farm net income because cost of transport and spoilage is considered in setting farm price
5. High cost of inputs coping with diseases, weeds and pests	- Mainly for yellow corn hybrids	- Poor cultural practices carried out at farm level, i.e., do not use appropriate chemicals as cost is too high, late or off-season planting - High cost of labor for weeding	- At times, considerable damage to crop from disease or pests - Decreases yields due to weeds or damage from pests diseases - Reduced price due to poor quality (damage) - Reduced farm income

Source: Farmer Interviews

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Inadequate drying floors, considered as the number one problem, was more critical for yellow corn farmers who had large volumes to sell than for white corn farmers. The largest percentage of farmers per barangay who stressed the need for dryers, were in these barangays: Pualas, Kibaning, Lampanusan, Hinaplanan, Ane-i, Milaya, and Katutungan. On the other hand, the problem of inadequate working capital was more severe for the sample white corn farmers because they wanted to adopt the higher yielding but high cost technology of yellow hybrid varieties.

The third major problem, namely price fluctuations/low prices, primarily referred to the seasonal drop in corn prices during the peak harvest months. Farmers considered this situation to be caused by factors such as: a) previous corn imports arriving near the peak harvest season; b) heavy discount price for wet corn; c) inadequate number of local buyers to create competitive buying prices, especially in interior barangays, and d) insufficient access to market price information.

The poor transportation problem was mainly mentioned by farmers using the unsurfaced farm-to-market roads which became impassable whenever heavy rains occurred during the peak harvest season. For instance, in Bukidnon, heavy rains frequently washed-out the farm-to-market road in barangay Magsaysay and created deep "potholes" in barangay Lampanusan such that no vehicles could pass through those routes until the rains stopped and the roads dried. Another poor road condition referred to by the sample farmers was the main gravel road from Wao, Lanao del Sur up to Maramag, Bukidnon where broken bridges delay trucks full of corn. Still another transport-related constraint cited by the large farmers in Kalilangan and Wao was the inadequacy of trucks to haul corn from their fields to the post harvest facilities and to Cagayan de Oro.

With regards to production-related problems, the sample farmers stressed: 1) weeds, pests and diseases; 2) unpredictable weather condition; 3) high production costs; and 4) lack of working animals for land preparation. Additional location-specific problems included: 1) poor soil condition, i.e., acidic and/or eroded, in Aglayan (Malaybalay, Bukidnon) and Hinaplanan and Ane-i (Claveria, Misamis Oriental); and 2) periodic problems with the peace and order situation in Hinaplanan.

2. Distribution Level

The problems identified by the different types of corn traders at the supply site (Region X) and demand area (Cebu) are discussed in this section.

2.1. Barangay, Municipal and Provincial Traders Corn traders located within or near the corn production areas, i.e., the barangay, municipal and provincial traders, cited these major problems:

- * poor condition of roads and bridges;
- * inadequate working capital;

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- * fluctuating prices;
- * low credit recovery;
- * wet corn; and
- * low supply of corn (Table 9.2).

The poor condition of roads and bridges was more frequently cited by the medium to large municipal and provincial traders located in Kalilangan, Pangantucan and Wao. Whenever heavy rains occurred during the peak harvest season, the trucks of these traders either could not pass through the unpaved portions of the main highway or got stopped near broken wooden bridges. Delays in transporting the traders' corn increased risks of lower sales prices, involved additional costs to move corn beyond the stuck-up points and resulted in damage to corn quality. The poor road conditions in that area also meant higher operating costs due to the costly repairs and maintenance of trucks.



The poor condition of roads is the worst problem for barangay, municipal and provincial traders.

The problem of limited working capital was common to all types of corn traders: was most pronounced for the small barangay trader and the medium to large municipal trader who planned to expand their business. According to the sample traders, strict bank requirements, interest rates for loans and inadequate information on alternative credit sources prevented them from availing of formal credit. However, there was much variation in their perception of formal sources of credit. For instance, one municipal trader in Valencia, Bukidnon found the bank's requirement for a loan guarantee too stringent. While another large trader in Wao, Lanao Sur, was eyeing alternative formal credit facilities in order to expand the capacity of his solar dryer.

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Table 9.2 Problems Perceived by Sample Corn Traders at Barangay, Municipal and Provincial Sites, 1989

PROBLEMS	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Poor roads and bridges condition	- During the rainy season corresponding to the peak harvest months of July to August	- Unpaved national road from Wao to Maramag, Bulidnon (77 kms) caused stoppages of trucks trucks delivering corn within this area	- Delays in transporting corn involved risks in lower sales prices, additional costs to handle corn from stuck-up to trucks - Higher cost for transportation as truckers had to recover expenses for increase repair and maintenance of vehicles
2. Inadequate working capital	- Critical among the large municipal and provincial traders	- Limited access to formal credit due to bank requirements; e.g., loan guarantor - High interest rates of formal loans - Lack of adequate information on alternative sources of formal credit	- Difficulty in expanding the business to respond to the high demand for corn - Difficulty in investing in more post-harvest facilities, especially dryers to improve quality of corn and thereby earn higher prices
3. Price fluctuations	- Critical during the peak harvest season for yellow corn	- Rumors of impending Manila importation of yellow corn cause large traders in CDO to withdraw from the market, resulting in sudden drops in CDO wholesale prices - Prices during the lean season rise gradually and in small increments but drop sharply in large amounts during the peak harvest season such that traders have to recover these sudden price drop	- Substantial financial losses in trading when buying and selling prices do not yield optimum margins - Low profit margins during the peak harvest season
4. Low credit recovery	- Particularly among barangay and municipal traders who extended production loans to farmers	- Crop failures among trader-financed farmers due to infestations and adverse weather conditions - Non-availment of crop insurance by the trader-financiers	- Delinquent farmers could not avail of financing from same trader-source for the next cropping - Large traders with adequate finances secured farmers' crops with insurance against losses
5. Wet corn	- First cropping harvest period corresponding to rainy season	- Inadequate drying facilities among traders who could store in large volumes and longer periods	- Higher corn spoilage leading to financial losses - Price reductions by buyers due to lower quality corn
6. Low supply of corn	- First cropping harvest season in 1989	- The unusual "seller's market" characterized by high prices in this period caused a more aggressive buying among traders and prompted large farmers to hire trucks to directly transport corn to CDO - Conversion of corn lands to sugarcane in some areas of Bulidnon - Rat infestation reported in some barangays in Claveria	- Relatively lesser volume of corn procured by traders as compared to the previous years - Tight competition among traders in buying corn

The problem of "price fluctuations" mentioned by corn traders in the supply areas of Bukidnon referred to the normal price situation during the peak harvest season. At that time a "buyers market" condition could mean rapid but irregular drops in the farmgate price of corn in reaction to the Cagayan de Oro price which in turn responds to price changes in Manila and Cebu as corn reached end-users. For instance, a trader in Kalilangan who competed with other local traders for the farmers' corn could pay too much to his suppliers if Cagayan de Oro buyers sharply reduced their buying price. The problem of losses caused by such unanticipated price changes was referred to as "problems of price fluctuations." In the peak harvest season of 1989 this problem was minimal except for a brief period in September for yellow corn.

The problem of "low recovery of credit" was cited by 27 percent of the 37 traders interviewed in the municipalities of Malaybalay, Valencia, Maramag and Don Carlos. These traders explained that crop failures due to insect infestation and adverse weather conditions were the main reasons for the farmers' defaults.

"Wet corn" was primarily a problem for the large municipal and provincial traders in Kalilangan, Pangantucan and Wao, especially those who had insufficient drying facilities.

The problem of "low supply of corn" was most pronounced among the barangay traders (57 percent). To a lesser extent, the municipal traders sampled in Malaybalay, Valencia, Maramag and Don Carlos mentioned this problem and attributed it to the conversion of large corn lands into sugarcane within their vicinity. Another factor was the remarkably high prices during the "sellers market" condition which prevailed during that 1989 first cropping season. This caused more aggressive buying behavior from outside traders and also prompted many large farmers to hire trucks and directly sell their corn to Cagayan de Oro thus by-passing local traders. On the other hand, the "low supply of corn" reported by traders in Claveria was mainly attributed to the incidence of rat infestation in the barangays sampled during that particular first cropping season.

2.2. Trader/Shippers The corn trader/shippers in the supply/transshipment site of Cagayan de Oro and in the demand area of Cebu indicated a somewhat different set of problems. Cagayan de Oro trader/shippers who bought corn from the farmers and the barangay, municipal and provincial traders within Region X cited the following problems:

- * limited bottoms (i.e., vessels and/or space);
- * substantial shortage of corn grain purchased;
- * high moisture content of corn;
- * tight competition among traders;
- * inadequate working capital;
- * price fluctuations; and
- * pilferage at the Cebu Port (Table 9.3).

Table 9.3 Problems Perceived by Sample Trader/Shippers in Cagayan de Oro, 1989

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Limited bottoms (i.e., inadequate number of tramp vessels, limited space for breakbulk vessels & limited allocation of container vans)	- Primary during peak harvest season for corn	- About 20 trader/shippers in CDO compete for bottom spaces - Shipping companies have fixed schedule of trips for their vessels; only few tramps are available for exclusive hire of interested traders - Time-chartered tramps are more expensive and would need a minimum load of about 3,000 MT corn before it can be hired - Containerized vessels which allocate only about 30% of their vans to corn are the only ships that ply the CDO-Manila route; only 2-3 trips per week are made to Manila - Breakbulk vessels which ply the CDO-Cebu route at 2 vessels daily have a maximum allocation of only about 10,000 bags or 600 tons of corn per vessel	- Additional storage costs and risks of corn spoilage for traders when ships are not available - Delayed shipment to Manila meant missed opportunities for higher selling prices
2. Substantial shortage of corn grains purchased	- First cropping harvest in 1989	- Conversion of large corn lands in some parts of Bukidnon to sugarcane - Significant increase in demand of commodity for food and fuel - Tight competition among trader/shippers in corn procurement due to unusual high level of prices in that period	- Reduced volume delivered to processors/feedmillers at demand area - Quick disposal of corn by traders to take advantage of high prices and strong demand for corn and therefore very little amount stored for the lean season
3. High moisture content of corn	- First cropping harvest period corresponding to the rainy season	- Harvesting done during rainy months - Inadequate dryers in supply areas	- Higher operating costs to reduce moisture content of corn to storability level - High risks of corn spoilage - Lower returns due to price deductions for wet corn
4. Inadequate working capital	- Peak months of harvest	- Longer turn-around time for corn sold to Manila, i.e., 60 days - High costs of money/high bank interest rates	- Limited volume of corn purchased than desired level - Quick disposal of even wet corn
5. Tight competition among traders	- All-year round	- Increased market entry of municipal traders during the past 5 years - Unusual high level of prices during the first cropping harvest in 1989 causing more aggressive buying operations among traders - Reduction of corn harvests due to conversion of some corn lands to sugarcane	- Quick disposal of even wet corn - Difficulty in controlling standards for better quality of corn due to large number of traders competing for supply of even wet corn
6. Price fluctuations	- More critical during peak months of harvest season	- Seasonality of the crop characterized by sudden and larger increments of price drops during peak harvest season vis-a-vis gradual and lower increments of price increases during lean months - Improper timing of corn import arrivals which coincide peak harvest season	- Strong need for large corn procurement funds in order to recover the lower margins during the harvest season by buying in bigger amounts for quick disposal and for storage during the lean months - Financial losses due to lower prices received for their corn landed in Manila
7. Pilferage at Cebu Port	- More critical during first cropping season when larger volumes are shipped	- Lax security measures in Cebu Port, i.e., people other than the cargo handling services could enter the port	- Reduced profit for CDO shippers as they shouldered the losses when the volume delivered was decreased at Cebu Port

Source: Trader/Shippers Interviews

The main problems with shipping as reported by the Cagayan de Oro trader/shippers referred to: a) the inadequate number of small tramping vessels available for trips to Cebu and Manila; b) the few vans allocated to low value corn in the container vessels which are the only ships that regularly ply the CDO-Manila route; and c) the limited space in the breakbulk vessels that ply daily the CDO-Cebu route. For shipments to Manila, the least costly and most desirable form of transportation, i.e., container vessels, maintained inflexible schedules and allocated very few vans to low value corn. Consequently, trader/shippers could not rely on these shipping companies to haul their large volumes contracted for specific arrival times. The main alternative form of transportation was the tramp vessel. However, these were very few, their freight rates were higher and a minimum of 1,000 - 1,500 MT of corn was needed to fill one. Delays in corn shipments for these medium to large traders meant additional storage costs, risks of corn spoilage, missed opportunities for higher selling prices and penalties for delayed contractual obligations with Manila buyers. Another related problem which CDO trader/shippers mentioned was the high incidence of corn pilferage at Cebu port during periods of large shipments. According to the CDO traders, losses per bag could run as high as 5 kgs.

The problem of substantial shortages in corn purchased by Cagayan de Oro trader/shippers reflected the unique situation of that first cropping season. It involved an especially strong demand which meant more inquiries from potential buyers than usual yet less procurement from supply areas than expected due to less area planted in corn. High moisture content was common for Bukidnon corn, exacerbated by farmers rapidly harvesting and selling their corn to earn the exceptionally high prices.

In Cebu, the trader/shippers or those who bought corn grain directly from Cagayan de Oro cited inadequate vessels as their major problem during the peak harvest months (Table 9.4). Their problems were similar to those of Cagayan de Oro traders/shippers which included the high moisture content of corn from Cagayan de Oro, reduced corn grain purchased from that major supply area and price fluctuations due to improper timing of corn imports which caused sudden drops in the prices of yellow corn.

3. Processing Level

The problems cited by the corn millers and feedmillers both in Region X and Cebu are presented in this section.

3.1. Corn Millers in the Northern Mindanao Region The two main types of corn millers sampled were: 1) custom millers, i.e., small-scale millers who charge a service fee for milling corn grain and do not sell grits; and the 2) commercial millers, i.e., medium to large scale corn millers who buy corn grain and sell grits. The high moisture content of corn coming from the production areas was the second most frequently cited problem by both types of corn millers interviewed in Region X. Wet corn increased their operating expenses because of costs to dry grain prior to milling, a lower percentage recovery of grits, and a longer time required for milling.

Other problems varied by the type of miller. The custom millers indicated these specific problems:

Table 9.4 Problems Perceived by Sample Cebu Trader/Shippers Regarding the Corn Commodity System, 1989

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Inadequate bottoms from CDO, South Cotabato and Davao	- Peak months of harvest season for corn	- Shipping companies have fixed schedule of trips for vessel - Only few tramps are available for hire - Limited allocation of bottom space for corn	- Delayed shipment meant missed opportunities for higher selling prices
2. High moisture content of corn from CDO	- First cropping season's harvest in Region X	- Harvesting is done during rainy months - Inadequate dryers in supply areas	- High risks of corn spoilage - Lower returns due to price deductions for wet corn
3. Reduced corn grain supply from CDO	- First cropping of 1989 in Region X	- Significant increase in demand by corn millers and feed-millers - Conversion of large corn areas in Bukidnon to sugarcane - Tight competition among end-users in Cebu for corn due to unusual high prices of corn	- Inability to meet demand for corn millers and feedmillers - Bribe disposal of even wet corn in the market - For some traders, spoiled corn was sold/accepted in the market
4. Price fluctuations	- More critical during peak harvest months	- Seasonality of corn production - Improper timing of yellow corn import arrivals	- Need to recover smaller margins when the prices suddenly drop during peak harvest season - Yellow corn prices abruptly drop

Source: Trader/Shipper Interviews

Table 9.5 Problems Perceived by Sample Custom Millers in Northern Mindanao, 1989

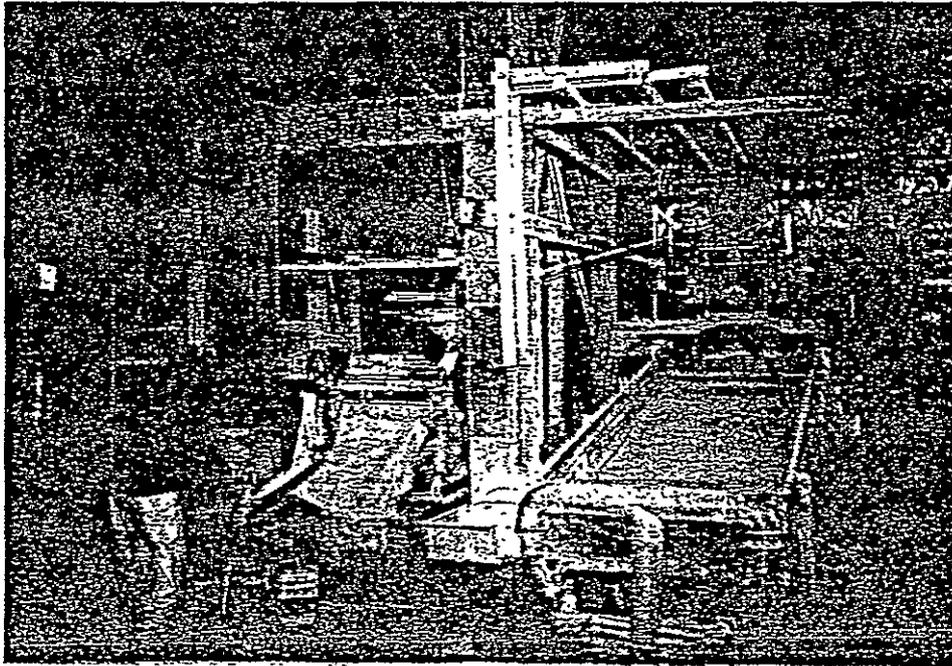
PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Low milling recovery	- Harvest season for corn	- Decline in customers/volume of corn milled as more harvesters were paid in cash than with corn, and when corn farmers shifted as laborers for sugarcane fields such that they no longer produced own corn food and bought grits instead - High operating costs which include labor, power and spare parts	- Less returns for custom millers
2. High moisture content of corn	- First cropping season's harvest	- Inadequate dryers in production areas - Corn harvests occur during rainy season	- Added costs to operations due to additional costs for drying, lower percentage recovery of grits and longer time for milling
3. Inadequate working capital		- Less revenue in milling business - Difficult to access formal credit - High interest rates of formal credit	- Difficult to expand business to commercial milling

Source: Custom Miller Interviews

- * low milling revenue;
- * high moisture of corn; and
- * lack of working capital (Table 9.5).

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The custom millers attributed "low milling revenues" to less demand for their services and to the increasing costs of milling operations. The market for their services was reduced when such regular customers as harvesters began being paid more frequently in cash instead of corn. Another reason was that several corn farmers recently shifted to sugarcane, thus no longer produced corn for home consumption but instead bought grits from retail stores. Although some custom millers had hopes of going into commercial milling, they were restrained by inadequate working capital, especially for buying corn grain.



Custom milling appears to be a "sunset industry" because of low milling revenues.

The commercial corn millers in the region cited the following problems:

- * inadequate supply of white corn grain;
- * high moisture content of corn;
- * inadequate bottoms (vessels); and
- * poor condition of roads and bridges (Table 9.6)

The commercial millers cited two (2) major reasons for the "inadequate supply of white corn": 1) the dwindling production areas for white corn due to the aggressive promotion of higher yielding yellow corn hybrids and the decreasing number of corn grits consumers relative to rice eaters; and 2) tight competition for corn from the Cagayan de Oro buying stations of Cebu traders and/or

Table 9.6 Problems Perceived by Sample Commercial Corn Millers in Region X, 1989

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Inadequate supply of white corn	- More pronounced in first cropping harvest in 1989	- Dwindling production of white corn due to aggressive promotion and high yielding performance of yellow corn hybrids and the decreasing number of consumers who eat corn grits in favor of rice - Tight competition for corn supply with Cebu-based buying stations in CDO - Unusual level of high prices caused more aggressive buying behavior among large buyers in CDO	- Milling operations run below normal capacity - Wet corn was accepted but had to be dried first - To maximize tax period, yellow corn was milled - Not enough white corn stored and milled during lean months
2. High moisture content of corn harvest	- First cropping harvest	- Inadequate dryers at the production areas - Harvest period correspond to rainy season	- High cost of milling operations due to additional costs for drying, lower percentage recovery of grits and longer time required for milling
3. Lack of bottoms	- During peak harvest months & for millers who shipped-out out corn	- Limited allocation of space given by shipping companies - Fixed schedule of trips for vessels - Tight competition with above 20 corn shippers in the region	- Increased storage costs - Delayed recovery of capital
4. Poor condition of roads and bridges	- During the rainy season corresponding to the peak harvest months of July to August	- Unpaved national road from Wao to Maramag caused stoppages of trucks delivering corn from this area	- Higher transport costs and maintenance of trucks - Delays in transporting corn involved risks in lower prices, additional costs to handle corn from stuck-up to trucks

Source: Commercial Corn Miller Interviews

millers. The tight supply of white corn experienced by the local commercial corn millers was further tightened by the aggressive corn search tactics employed by the large corn buyers in Cagayan de Oro, given the exceptionally high prices of corn. Due to the shortage of white corn, millers operated below normal capacity, accepted even wet corn and started to mill yellow corn to minimize lax periods and to provide regular customers with some form of grits. However, these commercial millers anticipated even worse problems of inadequate stocks for the upcoming lean months.

The other problems mentioned, such as inadequate bottoms and poor condition of roads and bridges, were also cited by the large corn buyers or trader/shippers in Cagayan de Oro.

3.2. Corn Millers in Cebu Cebu commercial millers experienced almost the same major problems as those of Region X millers, namely:

- * inadequate supply of white corn this cropping season;
- * high moisture content of corn coming from Cagayan de Oro;
- * lack of bottoms (vessels); and
- * unannounced brown-outs/power failures (Table 9.7).

Cebu corn millers attributed their main problem of inadequate supply of white corn to the reduction in volume shipped from Cagayan de Oro during the first cropping in 1989 as compared to the previous year. Another reason cited was the growing competition for the limited white corn supply among the many end-users in Cebu.

In Cebu, the corn millers had to vigorously compete for that season's limited supply of Mindanao white corn with several major end-users: 1) the local corn starch and oil manufacturers; 2) the Integrators and feedmillers who substituted white for yellow corn in feeds whenever yellow corn became scarce; and 3) the poultry and hog raisers who had stepped-up livestock production to meet the rising demand for meat products in that burgeoning city. This intensely competitive environment for corn encouraged several Cebu millers to integrate backwards by establishing their own buying stations in Cagayan de Oro as well as in General Santos, South Cotabato (a province in Region XI). Those without integration to the production areas relied on the local trader/shippers or Cebu large traders (dealers) for their corn supply and reportedly were operating further below normal capacity. Yet still other millers either milled yellow corn grits or bought already processed grits from Mindanao millers and sold them through a well-established network of grain wholesalers and retailers within Cebu and the neighboring island-provinces. Those alternative strategies enabled them to survive that shortage situation.

The two shipping vessels' daily Cagayan de Oro-Cebu routes compared to the one vessel's weekly General Santos and Davao-Cebu route has contributed to Cebu millers increasingly heavy reliance of Cagayan de Oro corn. Thus given the inadequate supply of white corn, Cebu millers were "forced" to accept the increasingly wet corn coming from Cagayan de Oro. For Cebu millers, wet corn was a problem that gave no recourse but to mix it with the dry corn from General Santos before being able to mill it. Although this "mixing" strategy enabled them to survive in the milling business, the practice had these disadvantages: 1) very short shelf life for

Table 9.7 Problems Perceived by Sample Commercial Corn Millers in Cebu, 1989

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Inadequate supply of white corn	- More pronounced in first cropping harvest in 1989	- Dwindling production of white corn due to aggressive promotion and high yielding performance of yellow corn hybrids and the decreasing number of consumers who eat corn grits in favor of rice - Tight competition for corn supply with the large buyers of white corn in Cebu and with the growing number of livestock raisers in the provinces - Unusual level of high prices caused more aggressive buying behavior among large buyers in Cebu - Some suppliers shipped corn directly to Manila due to higher price	- Milling operations run below normal capacity - Wet corn was accepted but mixed with dry corn - To maximize lax period, yellow corn was milled - Not enough white corn stored and milled during lean months
2. High moisture content of corn	- First cropping harvest	- Inadequate dryers at the production areas - Harvest period correspond to rainy season	- Mixing of wet grain from CDO and dry corn from other regions for milling - CDO grains received lower price than General Santos grains - Cebu grits not competitive in quality with Mindanao grits being shipped to the area
3. Lack of bottoms	- During peak harvest months & for millers who shipped-out corn	- Limited allocation of space given by shipping companies - Fixed schedule of trips for vessels - Tight competition with above 20 corn shippers in the region	- Increased storage costs - Delayed recovery of capital
4. Unannounced brownouts/power failures	- Occasional periods in 1989	- Inadequate power source	- Undetermined losses in business - Waste of time in cleaning the mill prior to the next operation - Risks in damage to machinery

Source: Commercial Corn Miller Interviews

grits before turning black, i.e., grits had to be disposed of within two-three days of milling; 2) additional operating costs whenever wholesalers-retailers returned the damaged grits for re-milling; and 3) the quality and price were not competitive as those grits coming to Cebu from Davao.

The other problems cited by Cebu corn millers, such as the lack of bottoms for shipping grains in and grits out during the peak harvest season and the irregular electrical power failures experienced in 1989, meant additional costs and weakened their competitive position vis-a-vis Mindanao millers.

3.3. Feedmillers in Cagayan de Oro Problems perceived by feedmillers in Region X were based on only two feedmills operating in the region. One is a branch factory of an Integrator while the other is a cooperative feedmill servicing its member hog and poultry raisers. These feedmillers referred to the following problems:

- * poor condition of roads and bridges;
- * inadequate supply of yellow corn; and
- * rising costs of feed ingredients (Table 9.8a).

The feedmillers in Cagayan de Oro procured corn directly from the major production areas, such as Wao. Thus the poor condition of roads and bridges along Wao to Maramag, Bukidnon posed a serious transportation problem whenever heavy rains occurred during the first cropping harvest season.

The other problem of inadequate supply of yellow corn had historically occurred during the lean months from February to June. However this year the feedmillers noted the substantial decrease in the volume of corn supplied during the 1989 first cropping season as compared to the previous year's harvest. The resulting shortage and high prices of corn meant higher costs for feeds and increased competition from traders and processors of corn in Cagayan de Oro.

The rising cost of feed ingredients mentioned by the feedmillers referred to the imported products, such as soya and fishmeal needed to manufacture quality feeds. For the feedmillers, the high cost of imported inputs would have to be backed up by optimum pricing strategies and an efficient sales performance in order to remain profitable.

In addition to the problems faced in common, the cooperative feedmiller in Cagayan de Oro was concerned about its strong competition with the larger commercial feedmiller in the region and with the Cebu feedmillers who have been shipping mixed feeds to the region. These commercial feedmillers had a relatively better competitive edge in terms of scope of market and economies of scale in processing.

3.4. Feedmillers in Cebu In the demand area of Cebu, feedmillers interviewed cited the following problems:

Table 9.8 Problems Perceived by Sample Feedmillers in Cagayan de Oro & Cebu, 1989

A. Cagayan de Oro City

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Poor condition of roads and bridges	- During the rainy season corresponding to the peak harvest months of July to August	- Unpaved national road and bridges from Wao to Maramag, Bukidnon caused stuck-up of trucks in some portions along this route	- Delays in transporting corn meant delay in processing of feeds - Additional costs for repair and maintenance of vehicles
2. Inadequate supply of yellow corn	- Historically critical during lean months from February to June but was more pronounced during the first cropping harvest season in 1988	- Seasonality of the crop - Conversion of large corn lands in some parts of Bukidnon to sugarcane - Tight competition for corn supply with many large traders and processors in CDO, especially during the unusual high level of prices in August to September, 1989	- Corn had to be procured directly from distant but large supply areas, particularly Wao, and during very scarce periods, even from Davao - Buying price of feedmillers became competitive with the large traders/processors in CDO
3. Rising cost of feed ingredients	- Particularly for imported feed ingredients, e.g., soya & fish meal	- High cost of imported ingredients for quality feeds	- High costs of operations must fully backed up by a pricing strategy and an efficient sales performance for business to remain profitable

B. Cebu

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. High moisture content of corn coming from CDO	- First cropping harvest period corresponding to the rainy season	- Harvesting done during the rainy months - Inadequate solar dryers in supply areas and in milling sites	- Feeds mixed with wet corn had lower quality and had shorter shelf life - Additional costs for drying wet corn - Feedmillers had to buy dry corn from Davao at a higher price
2. Rising cost of feed ingredients	- Particularly for imported feed ingredients	- High cost of imported ingredients for quality feeds	- High cost of operations must be fully backed up by optimum pricing strategies and an efficient sales performance for business to remain profitable
3. Inadequate supply of yellow corn	- Historically critical during lean months from February to June but was more pronounced during the first cropping harvest season in 1989	- Seasonality of the crop - Substantial decrease in the volume of corn shipped from CDO as compared to 1988 level - Tight competition for supply among the many end-users of corn in Cebu	- Limited volume of corn processed for feeds - When yellow corn was scarce then white corn was substituted but an additional ingredient, carotene had to be added
4. Unannounced brownouts/power failures	- Occasional periods in 1989	- Inadequate power source	- Undetermined losses in business - Waste of time in cleaning the mill prior to the next operation - Risks in damage to machinery

Source: Feedmiller Interviews

- * high moisture content of corn coming from Cagayan de Oro;
- * rising cost of feed ingredients;
- * inadequate supply of yellow corn; and
- * unannounced brown-outs/power failures (Table 9.8b).

Cebu feedmillers' main problem was the high moisture content of corn coming from their main source of corn supply, Cagayan de Oro. This was critical because feeds that include wet corn had a lower quality and shorter shelf life, i.e., feeds had to be disposed of more quickly or consumed by hogs within three days upon milling. Wet corn required drying, yet Cebu feedmillers had limited drying facilities. Although these feedmillers tried to buy dry corn from Davao at a higher price, there were infrequent container shipping services to Cebu (only once a week) compared to the daily shipping options from Cagayan de Oro.

The other problems mentioned by Cebu feedmillers were similar to those of Cagayan de Oro feedmillers, namely, the rising cost of feed ingredients and the inadequate supply of corn usually during the lean months (exceptionally high during the first cropping harvest in 1989). Additionally, Cebu feedmillers reported the problematic incidences of unannounced brownouts/power failures which reduced output and harmed their equipment.

4. Consumption Level

The problems presented under the consumption level center on the hog and poultry raisers as end-users of corn livestock feeds. Backyard and commercial raisers of hogs and poultry were sampled in both Region X and Cebu.

4.1. Hog Raisers in Region X The promising potential of hog raising as a value-added strategy for the corn produced in Region X warranted the special research on this industry. A more thorough discussion on the problems as well as opportunities confronting the hog industry in Northern Mindanao region is contained in Chapter X. The following discussions on the problems of hog raising in that region from the viewpoint of the livestock raisers helps reinforce the findings and analysis contained in Chapter X.

The backyard or small-scale hog raisers in Region X indicated the following problems:

- * incidence of epidemics;
- * limited market during summer;
- * inflow of native hogs from a neighboring region; and
- * inconsistent quality of commercial feeds (Table 9.9a).

Table 9.9 Problems-Perceived by Sample Backyard & Commercial Hog Raisers in Region X, 1989

A. Backyard Hog Raisers			
PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Incidence of epidemics	- During the rainy season	- Sudden change in temperature causes stress to hogs - Inadequate housing sanitation for animals	- Higher percent of animal sickness and mortality
2. Low market during summer	- Particularly during vacation and Lenten season (April-May)	- Decreased meat consumption in the urban areas as students return to their hometown during the school break - Abstinance during the Lenten season among Roman Catholics	- Reduce profit margin during this particular season
3. Inflow of native hogs from a neighboring region	- Critical for hog raisers in Misamis Oriental	- Difficulty in competing price prices with the cheaper native hogs coming from Zamboanga	- Selling prices of hogs were reduced to be competitive with the cheaper hogs coming from outside the region
4. Inconsistent quality of commercial feeds	- Occasional periods	- Unbalanced feed ration used by some feedmillers - Adulterated feed ingredients sold by some feedmillers and feed dealers - High cost of feed ingredients which encourage some feedmillers to use cheaper but low quality substitutes	- Slow growth rate - Incidences of illness of animals
B. Commercial Hog Raisers			
PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Lack of breeding stock available in Region X	- Year-round	- Only one source of breeding stocks in Cebu	- Limited genetic base - Lower profits due to inability to produce hogs with higher carcass quality
2. High percentage of losses during hog shipment	- Especially during rough seas	- Transport stress due to sea sickness	- Lower margins due to reduction in hog weight (maximum of 8 kg loss per animal)
3. High cost of feed ingredients	- During lean months of corn, i.e., February to June	- Seasonality of corn and by-products (rice bran and corn bran	- High cost of production which reduces profitability
4. Inadequate hog vans for Manila shipment and absence of hog vans for Cebu shipment	- During high volume of trade in Cagayan de Oro - Year round	- Inadequate incentives for shipping companies to shipback empty hog vans vis-a-vis the high volume of revenue earning cargoes that could be loaded back - The size of a regular van could not fit in the vessels plying CDO-Cebu route	- Delayed marketing of hogs to Manila - CDO hog raisers had to use collapsible vans for Cebu shipment
5. Inadequate working capital	- Too rapid expansion of project	- Improper financial planning due to inadequate understanding of the piggery operation	- Inefficient operation

Source: Backyard and Commercial Hog Raiser Interviews

Backyard hog raisers in Region X were mainly concerned on the problem of animal illness and mortality during incidences of epidemics. The sudden temperature changes during the rainy season caused stress on animals making them highly susceptible to disease outbreaks. Another factor that contributed to such epidemics was the inadequate housing sanitation practiced by some livestock raisers.

The limited market for hogs during the summer season has been a perennial problem because meat consumption in urban areas decreases whenever school goes on a break. The yearly observance of the Lenten season called for meat abstinence on specified days for the large Roman Catholic population, and thus limited market for hogs during that period.

Backyard raisers in Region X likewise noted as a problem the inflow of the cheaper-priced native hogs specifically from Zamboanga, an adjacent province in Region IX. The selling prices of both the native and hybrid hogs sold in Region X were lowered in order to compete with the hogs coming from outside the region.

Another problem was the inconsistent quality of commercial feeds sold by various feed dealers in the region. The hog raisers attributed the slower growth of animals to the adulterated feed ingredients sold.

Sample commercial hog raisers in Northern Mindanao region mentioned the following problems:

- * lack of improved breeding stock available in Region X;
- * high percentage of losses during hog shipment;
- * high cost of feed ingredients;
- * inadequate hog vans for Manila shipment and absence of hog vans for Cebu shipment; and
- * inadequate working capital (Table 9.9b).

The lack of breeding stock available in Region X was considered as the main problem by the commercial hog raisers because they incurred additional costs to buy the breeders from Cebu. This problem has limited their animals' genetic base and should eventually reduce their profit margins due to lower quality of carcass sold.

The commercial hog raisers likewise reported a high percentage of weight loss during hog shipments. According to them, the weight loss during shipment in rough seas could reach as much as 8 kgs per finisher hog. A closely related problem was the inadequacy of hog vans for shipping the finishers to Manila and the complete lack of hog vans for Cebu shipments.

Shipping companies allocated very limited space and few hog vans for their vessels going to Manila because these vans were shipped back to Region X empty instead of hauling a higher-revenue cargo. On the other hand, vessels going to Cebu were structurally unfit for the regular sized hog vans. Thus, Region X raisers shipping hogs to Cebu improvised their own collapsible hog vans.

The problem of high cost of feed ingredients meant lower profit margins for the commercial hog raisers. They attributed the problem to the seasonality of corn production and by-products, such as rice bran and corn bran. Other commercial raisers further noted their inadequate working capital as a problem. This situation usually arose whenever a raiser expanded his piggery operation too rapidly without properly planning for his cash flow position. An inadequate understanding of this business usually led to that mistake.

4.2. Hog Raisers in Cebu The backyard hog raisers in Cebu mentioned the following problems:

- * incidence of epidemics and
- * inadequate working capital (Table 9.10a)

Like the backyard hog raisers in Region X, Cebu backyard raisers considered their main problem to be the high incidence of epidemics during the rainy season. They also mentioned the problem of inadequate working capital which hindered their purchase of the high quality feed ingredients required for faster growth and better carcass value of animals.

On the other hand, the commercial hog raisers in Cebu expressed as their problems the following:

- * high cost of production ;
- * inadequate supply of corn from Mindanao; and
- * incidence of epidemics (Table 9.10b).

One aspect of their high cost of production was the comparatively higher cost of labor in that major city in the Visayas. Since the Cebu commercial hog raisers heavily depended on Mindanao for their corn supply, the high cost and scarce corn supply during the lean months of corn production exerted a heavy toll on their business. The tight corn supply situation was compounded by the presence of many types of end-users in Cebu competing for all available corn grain.

Epidemics affected these commercial as well as backyard hog raisers.

Table 9.10 Problems Perceived by Sample Backyard & Commercial Hog Raisers
In Cebu, 1989

A. Backyard Hog Raisers

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Incidence of epidemics	- Especially during the rainy season, July to September	- Sudden change in temperature causes stress in hogs	- High percentage of mortality and morbidity
2. Inadequate working capital	- Particularly for feed procurement	- High cost of feed ingredients - Difficult to access soft loans from formal sources	- Feed rations used had less nutritive value resulting to slower or unmaximized animal growth and lesser quality of carcass

B. Commercial Hog Raisers

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. High cost of production	- Particularly for cost of feed ingredients	- Rising cost of corn and imported feedstuffs - High cost of labor	- High break-even point resulting to lower profits
2. Inadequate supply of corn from Mindanao	- Especially during the lean months, February to June	- Seasonality of corn production causing scarcity in certain periods - Tight competition for corn supply among the many end-users in Cebu	- Stocks had to be depopulated to maintain efficient operations - Difficulty in fully responding to the high demand for live hogs Cebu and Manila
3. Incidence of epidemics	- Especially during the rainy season, July to September	- Sudden change in temperature causes stress in hogs	- High percentage of mortality and morbidity

Source: Backyard and Commercial Hog Raiser Interviews

Shipping companies allocated very limited space and few hog vans for their vessels going to Manila because these vans were shipped back to Region X empty instead of hauling a higher-revenue cargo. On the other hand, vessels going to Cebu were structurally unfit for the regular sized hog vans. Thus, Region X raisers shipping hogs to Cebu improvised their own collapsible hog vans.

The problem of high cost of feed ingredients meant lower profit margins for the commercial hog raisers. They attributed the problem to the seasonality of corn production and by-products, such as rice bran and corn bran. Other commercial raisers further noted their inadequate working capital as a problem. This situation usually arose whenever a raiser expanded his piggery operation too rapidly without properly planning for his cash flow position. An inadequate understanding of this business usually led to that mistake.

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Like the backyard hog raisers in Region X, Cebu backyard raisers considered their main problem to be the high incidence of epidemics during the rainy season. They also mentioned the problem of inadequate working capital which hindered their purchase of the high quality feed ingredients required for faster growth and better carcass value of animals.

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- * high cost of production;
- * inadequate supply of corn from Mindanao; and
- * incidence of epidemics (Table 9.10b).

One aspect of their high cost of production was the comparatively higher cost of labor in that major city in the Visayas. Since the Cebu commercial hog raisers heavily depended on Mindanao for their corn supply, the high cost and scarce corn supply during the lean months of corn production exerted a heavy toll on their business. The tight corn supply situation was compounded by the presence of many types of end-users in Cebu competing for all available corn grain.

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B. Commercial Hog Raisers

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. High cost of production	- Particularly for cost of feed ingredients	- Rising cost of corn and imported feedstuffs - High cost of labor	- High break-even point resulting to lower profits
2. Inadequate supply of corn from Mindanao	- Especially during the lean months, February to June	- Seasonality of corn production causing scarcity in certain periods - Tight competition for corn supply among the many end-users in Cebu	- Stocks had to be depopulated to maintain efficient operations - Difficulty in fully responding to the high demand for live hogs Cebu and Manila
3. Incidence of epidemics	- Especially during the rainy season, July to September	- Sudden change in temperature causes stress in hogs	- High percentage of mortality and morbidity

Source: Backyard and Commercial Hog Raiser Interviews

4.3. Poultry Growers in Region X The backyard and commercial poultry growers in the Northern Mindanao region considered these as their problems:

- * inadequate supply of day-old chicks;
- * inconsistent quality of commercial feeds;
- * incidence of epidemics;
- * inadequate working capital; and
- * price competition for poultry eggs with Cebu suppliers (Table 9.11a).

The amount of available day-old chicks dipped to especially low levels just before the Christmas holidays, i.e., from October to November, because of high demand in anticipation of the highly-priced poultry meat during the Christmas season. Another problem which the Region X poultry growers mentioned was the inconsistent quality of commercial feeds that they bought from local feed dealers. Since poor quality led to the slower growth of broilers, Region X poultry growers usually had to rely on the better quality feeds sold in Cebu. The incidences of epidemics particularly occurred during the rainy season.

The problem of inadequate working capital among the Region X poultry growers stemmed from three reasons: 1) improper financial planning; 2) financial losses incurred during the lean months for dressed chicken, especially whenever Luzon Integrators dumped dressed chicken to the Region X market during this period; and 3) difficulty in availing of soft loans from formal sources.

With regard to layer operations in Northern Mindanao, operators cited stiff price competition from the big volume of table eggs shipped in from Cebu. This situation forced Region X poultry operators to lower their selling prices of eggs sold to local dealers.

4.4. Poultry Growers in Cebu The following problems were mentioned by the Cebu poultry growers:

- * inadequate supply of corn from Mindanao;
- * high-cost of production; and
- * incidence of epidemics (Table 9.11b).

Being relatively farther from the corn production area, poultry growers in Cebu considered as their main problem the inadequate supply of corn from Mindanao.

Table 9.11 Problems Perceived by Sample Poultry in Northern Mindanao & Cebu, 1989

A. Northern Mindanao

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Inadequate supply of day-old chicks	- Just before the Christmas holidays, i.e., October to November	- Increased in demand for day-old chicks in anticipation of high priced poultry during Christmas holidays	- Failure to take advantage of high demand for broilers meant loss of opportunity to make profits
2. Inconsistent quality of commercial feeds	- Affects more backyard raisers who buy from feed dealer	- Use of low quality feed ingredients by feedmillers	- Slow growth of broilers
3. Incidence of epidemics	- Year round	- No break in rearing of broilers in the farm	- Losses due to high mortality and morbidity of broilers
4. Inadequate working capital	- Critical during lean months for dressed chicken - Financial losses incurred during the lean months as Luzon Integrators dumped dressed chicken in Region X during this period forcing Region X growers to reduce their selling prices - Difficulty in accessing soft loans from formal sources	- Improper financial planning - Inefficiency in operation	- Losses due to selling below production costs
5. Price competition for poultry eggs with Cebu supplies	- Year round	- Big volume of eggs from Cebu are regularly shipped to CDO	- Lower selling prices of eggs from CDO meant lower profit margins

B. Cebu

PROBLEM	UNDER WHAT CONDITION	CAUSES	EFFECTS
1. Inadequate supply of corn from Mindanao	- Especially during the months; i.e., February to June	- Seasonality of corn production	- Difficulty in expanding operations to meet the high demand for poultry production within the region
2. High cost of production	- Applies especially to cost of feed ingredients, i.e., corn & imported feedstuffs	- Seasonality of corn production causing high prices during lean months - High cost of imported feed ingredients - High cost of labor	- Reduced or low profit margins for poultry growers
3. Incidence of epidemics	- During the rainy season	- Sudden change in temperature causes stress to poultry animals	- High percent of animal sickness and mortality

Source: Poultry Grower Interviews

The other problems are similar to those of hog raisers in Cebu.

B. Vertical Linkages

There are at least four important inter-level phenomena that have hampered the expansion of the corn system.

Wet corn originates at the farm level but causes serious health hazards to the consumers of grits as well as the animals fed contaminated feeds. Likewise, its tendency for rapid aflatoxin contamination makes long distance shipments problematic because the poor quality upon arrival may be rejected, thus causing trader/shippers considerable financial losses.

Yet, from a supply side perspective not only the lack of drying facilities at the barangay and poblacion levels but also inadequate pricing incentives for good quality corn cause this problem to persist. Likewise, the large number of trader/shippers and their fierce competition in the spot market of Cagayan de Oro City make the sale of most qualities so likely that no one wants to forego a potential purchase, especially during shortages. From the demand perspective since certain processing technologies can handle wet corn, hog raisers can feed their animals fresh wet corn, and Cebu millers can mix wet corn with dry corn before milling, why not ship it to them?

Inadequate, timely information on corn demand and supply conditions persists at the government level. Although larger scale Integrators invest in and have access to such information, they do not share it with others, including the government sector which has not invested sufficient resources in sustainable information collection, processing and dissemination services. Those most severely affected by this condition are those without access to the information nor the influence to benefit by corrective actions when serious problems arise.

For example, when imports were authorized and allocated, the big Integrators in Luzon were most likely to receive the first and largest share of imports. Those opportunities accrued to them even though they could have forewarned the government of this substantial increased demand for grain and enabled the public sector to take corrective measures in time.

Another dimension is the scarcity of information accessible at the regional and provincial offices of various government agencies. Some regional offices, such as FPA, have boxes of raw data that are not processed or organized in any fashion after the original materials are sent to the Central Office. Other offices cannot release information without special permission. And most frequently, the person in charge of the information is not around on a regular basis, consequently it is locked away for uncertain periods. This situation not only increases the costs of research but illustrates the lack of local information for use by marketing participants or local government officials.

Broken bridges on the main highway to Wao not only reduced farm incomes and increased trader risks and costs but also disrupted end-users ability to acquire timely supplies of corn. The location of the problem was site-specific but its impact went far beyond that place. In

fact, the historical slowness of infrastructural development in Bukidnon was a major reason why large agri-businesses invested in General Santos more than in Region X.

Separate but dependent seems to be the position of the Luzon-based end-users of corn, however, until now they have made very little investment in supply side improvements yet become very vocal about corn shortages or high prices. That theme is replayed almost every year when the imports are petitioned. Recent developments whereby Integrators are establishing poultry contracting arrangements in Mindanao, chartering their own vessels and discussing local buying and shortage schemes with trader/shippers may signal the start of an effective form of end-user support for corn suppliers. Clearly, some problems in the supply areas require investments and contacts beyond that level if inter-level problems are to be resolved.

C. Problems Regarding Marketing Flows

The second aspect of our three-way analysis of problems/constraints involves conditions or behavior which hampered the flow of commodities, money, and information within the corn commodity system. Each of these three will be examined below.

1. Commodity Flow

The major constraints in this regard were related to location, mode of transportation and season. During the rainy season both the farm to market roads and main gravel road from Maramag to Wao became impassable on an irregular basis. Carabao sleds, horse^s and/or tractors with trailers were the last resort for farmers moving grain from interior areas whenever the pathways became somewhat dry. Whereas 8-12 MT trucks repeatedly got stuck in the mud especially when using detours around broken wooden bridges on the Maramag-Wao road. In fact, a week or more would pass without a single truck moving in either direction while 50-90 trucks waited in line for the road to dry or a bulldozer to push a mired truck out of the way so that other trucks could pass. Because this was the main access road to such a major supply area, sizeable losses and market disruptions were attributed to this road condition. There was no such problem with commodity flows of this magnitude in the other parts of Bukidnon and Misamis Oriental.

The other constraint to timely commodity flow was the lack of adequate ships servicing the CDO to Manila shipping route during the peak season. However, the exact magnitude of this problem was difficult to measure because several traders strongly preferred the lower costs and less hazardous shipments by container van compared to the more available yet more costly tramping vessels. Although many corn shippers were very vocal about the "shortage" in container bottoms a few had time chartered tramping vessels and stressed other types of problems. Consequently, the question "seems to be more of seasonal shortage" related to type of vessel than an aggregate shortage of all types of vessels.

2. Money Flow

An important constraint experienced by rural banks and financiers in the more interior areas was high risks associated with moving large amounts of cash. Armed robberies of vehicles traveling the interior gravel roads or of truck drivers returning from selling commodities in Cagayan de Oro were well-known in several areas. Various approaches have been used to lessen this problem, such as bringing in truck loads of consumer goods to barter for corn, converting cash from sales of agricultural inputs (fertilizers, seeds and chemical) that can be backhauled, and even a proposal for using small aircraft to bring in large sums of cash. One consequence of this cash scarcity is the development of a local cash economy whereby those holding cash circulate it at high interest rates (50% or more per year) on a continuous basis rather than bringing in large sums for periodic purposes, such as during the harvesting season. This inability to safely bring in or handle periodic needs for large amounts of cash, such as during the major harvest seasons, means less competition from outside buyers for the corn from small farmers, especially in interior, less accessible areas. Likewise the pyramid flow of cash from large local financiers to smaller traders and then to small farmers means higher costs of capital since each set of lenders collects his fee (interest rate) for money/input provided.

3. Information Flow

The two way of flow of information included incoming information on buying prices for corn and out-going information on production and harvested areas of corn, including information on buying prices brought by "word-of-mouth" as truck drivers or others arrived from CDO or other trading centers such as Valencia, as well as "radio messages" sent by radio transceivers. This latter source was rather selective in that it involved those who owned and operated a transceiver both in the production areas (receivers) and CDO (senders). Since prices during the initial weeks of harvest tended to fall at varied rate and at unanticipated times, it was important for local traders to have access to daily price information to avoid paying "too much" or maintaining too wide a price margin relative to competitors.

Irregular breakdowns in this system of relayed radio signals caused "information shortages" especially if this corresponded with heavy rains which made the roads impassable for several days. This occasionally disrupted the timely flow of information back to local traders and was particularly problematic during periods of rapid price decline when the prevailing selling price in CDO could not cover the local trader's buying price and trucking costs.

The out-flow of information on production and harvested areas has always been very problematic on the survey data collectors and policy makers in the public sector. Again this year the lack of timely, accurate crop estimate for corn affected decisions on the level and timing for imports. The RMA team's exhaustive search for historical trends at the regional level as well as current production and harvested areas led to conflicting and incomplete estimates which were at most indicative rather than accurate. This substantial shifts in cultivation locations and increases in substitute crops made accurate estimate very difficult.

Another dimension of this information flow is the timely outflow to the Manila head offices of information collected by most regional and provincial offices of government agencies. The lack of well organized or processed data for that region from those same regional or provincial offices posed a problem. The person in charge of such information was often absent or if present and had data, it was raw daily or weekly data and usually spread around in various places. Of all local offices, NFA had the best and BAS the second best information system in place while other offices were of varying degrees of disarray. This impacted information is clearly detrimental to local decision making bodies not to mention the high costs for researches.

D. System Performance

Effectiveness and progressiveness were the two attributes with which the team evaluated the performance of this corn commodity system. Effectiveness means ability of the system to match demand preferences with corresponding characteristics of supply while progressiveness refers to more economical technologies, enhanced institutional capabilities, improved infrastructure and better management techniques. For Region X, the corn system is effective only in that market signals and incentives reaching the supply areas have produced corresponding response but in a lagged fashion.

Prices of less than P 2.50/kg were received by many corn farmers in such places as Wao during the peak harvest of 1988. This followed a pattern of ever decreasing real prices for corn in the July to September peak harvest season and signaled farmers to plant less corn in early 1989. Consequently, several farmers shifted to higher valued crops, such as sugarcane.

The decreased production of corn was not only due to less corn area in Northern Mindanao but also caused by typhoon damage to the large corn crop in Cagayan Valley of Luzon. Yet, demand for feeds has increased following strong demand for meat. Farmers and traders responded to the resulting high prices by harvesting and shipping corn to end-users as rapidly as possible. Again the response matched the signals. However, the "lagged timing" effect remains - next year's planting of the first crop will be responsive to the price during this peak harvest season. Consequently if major buyers, such as the Integrators and starch manufacturers, do not ensure a strong market during each peak harvest season, why should they expect growers to expand production?

This study's agenda for action and research identifies potential opportunities for strengthening and stabilizing the corn commodity system and the feed sector, especially during the lean months for corn. Without such strengthening perhaps imported meat should be considered whenever feeds cannot cope with the timing of demand for animal production.

The Manila-based associations of end-users had been effective in compensating for the corn shortage by successfully petitioning for, acquiring and allocating imported corn among their Luzon-based members during late 1989. Although this situation indicates the system's ability to correct for corn shortage for a select few, serious questions remain regarding equitable treatment of different end-users and distant corn growers during the lean months.

In Cebu, corn millers have been experiencing increased difficulty in procuring adequate "good" quality corn grain. Thus, at least four corn millers diversified their business into corn trading and established buying stations in Mindanao ports in order to improve quality and quantity of the grain reaching them. That is an indicator of improved system effectiveness.

Progressiveness was found in the infrastructure in terms of expanded, modern port facilities and increased shipping services between Cebu and Cagayan de Oro but seriously lacking in terms of the interior road network.

From a technology standpoint, corn sheller fabricators recently established in major corn supply areas have both mobile and stationary shellers with blower attachments to clean the corn. Recently introduced hybrid yellow varieties have improved performance in acidic soils. Although trials of white hybrid varieties showed promise of yields similar to yellow varieties, their grain quality did not include the desirable flinty quality according to millers. Innovative local designs for mechanical dryers included locally manufactured burners fueled by local materials, such as corn cobs. Some of these burners had been fitted to imported grain dryers to replace burners which required petroleum fuels. Likewise, the team observed both new local designs for mechanical dryers as well as skillful modifications to old imported mechanical dryers.

A technology on the input side included a small local firm which had used local ingredients to manufacture an improved type of organic fertilizer in direct competition with national brands. On the marketing side, trial tests of plastic straps to replace wooden pallets for shipping corn proved unsuccessful because of sabotage within the port area of Cebu rather than for any technical reason. Biogas technology is well-known and used by a select number of hog raisers. The new slaughterhouse facility in Cagayan de Oro city illustrates the consequences of introducing an efficient technology but hindering its use and increasing cost to consumers of meat by charging very high rates in order to repay loans for its construction. Most of the technologies noted above are indications of progressiveness, yet many remain isolated achievements rather than full scale production, distribution and technological accomplishments.

From an institutional perspective, a few promising indicators of progressiveness were found. The formation of local farmers groups in order to access formal crop loans is a case in point. Other farmers groups were formed to receive outside support for such equipment as shellers, threshers, and/or small rice mills. If they survive and thrive, these will be positive signs of institutional progressiveness in Northern Mindanao.

Another example of institutional flexibility is the formation of an association of hog and poultry raisers in Cebu for the main purpose of accessing imported corn. Unfortunately, this is symptomatic of crisis response to a problem faced by the industry rather than a constructive trend of mutual cooperation for continued improvements. It was reported that individualistic, business attitudes still prevail among the members of that industry. Existing local institutions of a commodity nature, such as the Oro Grains Association, tasked to provide a "voice" for the industry have had limited impact given minimal active participation by its membership whereas similar types of Manila-based associations have been more progressive in perspective.

Opportunities for progressiveness abound for the hog and poultry raisers if the proposed meat packing plant, breeding center and feed/diagnostic laboratories materialize. However, currently those sectors remain set in their "business as usual" mind-set.

Chapter X

SPECIAL CASE STUDY THE HOG INDUSTRY IN REGION X

During the field research for this RMA, it seemed evident that the hog industry presented a promising opportunity for implementing a value added strategy for corn in Region X. However, the team had to first determine "why" this industry had not grown nor prospered as expected. That expectation was based on the hog industry's location in a disease free zone, proximity to corn and related feeds, access to the modern CDO slaughterhouse, and to the excellent CDO port. The specialized expertise and experiences needed to fully understand this sector and the complex technical nature of this animal raising industry compared to crop production, required a more focused research approach than initially envisioned. This was needed to sort out the mixed reasons given by local piggeries for limited growth of the hog industry.

The urgent need for action to initiate the expansion of the hog industry warranted this special case study chapter which highlights crucial factors about the present status of the industry and provides action directive for short and long term improvements.

This case study begins with an overview of the hog industry in Region X and examines insights into why many hog raisers have not expanded rapidly nor have many new large scale investors entered. Then, it presents a hog raiser's "Appraisal Wheel" to guide prospective investors or troubled hog raisers in diagnosing and resolving problems with prospective or existing enterprises. The study also organizes information and experiences about key factors associated with each stage of sow, boar and hog growth patterns so that hog raisers are alerted to the "timing" factor which is so crucial for success. And finally, it specifies what various interest groups in Region X, such as individual raisers, groups of raisers, academia and the public sector can do to improve the performance of the hog industry at each stage of the hog productivity cycle. The point-by-point writing style is intended for clear, concise exposition of the relevant facts and ideas.

A. Overview

The overview will briefly explain the hog industry by participants and production trends before examining feed procurement, internal operations and sales patterns for this type of enterprise.

1. Industry Locations and Trends

The main types of hog raisers were the backyard raisers and commercial hog raisers. Backyard raisers were generally rural or urban households who grew 1-3 sows, sold or raised their litters, and used the slaughtered hogs for festivals or sold them on an irregular basis. Commercial raisers were in the business of raising hogs for sale at a profit and, as such, brought varying amounts of resources and management skill into this enterprise.

Backyard raisers were scattered throughout all barangays with increasing numbers located nearer urban centers, such as CDO. Commercial raisers were mostly found within 30 kms. of CDO, especially in the northern edge of Bukidnon. Although a few were found in the central part of Bukidnon, most of those who were formally in southern Bukidnon have gone out-of-business or moved closer to CDO.

Production trends remained difficult to accurately estimate due to the lack of secondary data and given current data collection methods for backyard growers. Although available data sources suggest some increase in commercial stocks of hogs in Region X, 33% of the piggeries began business before 1982 while 67% were established after 1982. At first this suggested a larger number of recent entrants and growth in the industry, however, closer examination indicated that several of the new entrants actually took over bankrupt hog farms. In other words, new ownership and management of old facilities are more prominent.

2. Feed and Procurement

Commercial hog raisers procured corn directly from farmers during the harvest seasons in order to keep costs down. However, during the lean months they are forced to buy from large CDO traders or NFA bodegas. Since they carefully monitored their inventories and utilization rate, they knew their requirements and planned accordingly. During the peak harvest season each raiser competed with traders for farmers' harvests by using various strategies. Each raiser developed his own strategy depending on location, farmers' needs and his own corn requirements. For example, those located near Bukidnon bought corn on the cob from farmers who had no shellers and did the shelling themselves, while others along the road leading to CDO offered free transportation from the corn grower's farm and/or paid prevailing CDO traders' rates. One hog raiser had previously financed farmers but stopped due to non-repayment when drought hit the farmers' crop. Another attempted to set-up buying stations in Valencia and Wao but could not afford to maintain them.

Commercial hog raisers locally sourced mill by-products, fish meal and cassava. While crops, soya, protein-based ingredients and specialized feeds were sourced from Manila, Cebu or local feedmillers.

Backyard raisers used household scraps, varied amounts of inexpensive corn and rice by-products, and a few additives, as well as whatever the hog could forage for itself. "Cheap" was the key expression used in deciding whatever feeds had to be bought for hogs. In fact, the abundance of rice bran in Iligan was the reason for so many hogs.

3. Internal Operations

Commercial hog raisers maintained their own hammer mill, bodegas and related equipment in order to keep feed costs low and inventories adequate. Management styles based on experiences, and training varied from farm to farm. Access to veterinarian services for technical matters was crucial. In fact, the larger farms hired a vet on a full time basis. Financial management was problematic when the cost of feeds increased unexpectedly, market prices dropped, and hog injuries or mortality rates suddenly increased. Good quality hogs sometimes were set aside when costs increased, labor irregularities cropped-up or market conditions warranted immediate sales. Precious

management time was spent complying with quarantine requirements, zoning for anti-pollution measures, shipping permits, wage requirements, and attending meetings called by government agencies. All of those activities were needed as well as hours of record keeping and accounting.

Backyard raisers used their household labor and whatever shelter was readily available. Basically little, if any, equipment or structure were required for this scale of enterprise. Major breeds for medium and large scale commercial piggeries were Large White, Cotswold, Duroc, Yorkshire, Berkshire, Hampshire and Landrace. Many local hog raisers improved their breeding stock by buying improved breeding stocks from Mountain Springs Development Corporation. Others procured from Asturias Farms in Cebu.

Backyard raisers mostly raised native hogs while small scale commercial growers preferred upgraded hogs, i.e., cross-breeds.

4. Sales

Most commercial piggeries sold live hogs with a market weight of 80-85 kg. For local markets hog traders purchased directly from the farm and sold to meat vendors and/or supermarkets. The balance of hogs entered the local slaughterhouse and CDO markets. A few piggeries marketed carcasses (meat) to local supermarkets or in the city center. Even less were the technical expertise and facilities for selling processed meat, inspite of CDO's reputation for quality ham products. A few large piggeries shipped a few hundred heads to Manila on a weekly basis (ranging from 85-90 kg/head). A few others recently began shipments to Cebu. Aboitiz, William Lines, and Sulpicio Lines loaded livestock in the CDO port.

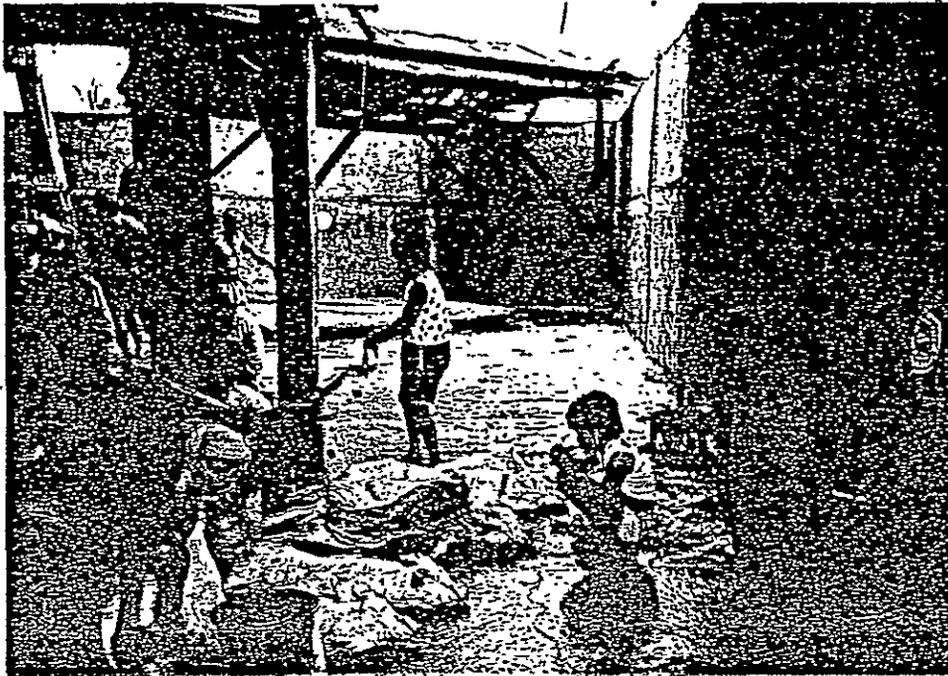
There was considerable competition among those shipping livestock in CDO. This involved 3 large cattle shippers and 2 large hog shippers. Hogs, were shipped in vans (66 heads/van) or in loosely fenced areas. Vans were preferred due to ease in handling and safety. In normal conditions a vessel will arrive in Manila within 48-52 hours after leaving CDO. There a sales coordinator monitors the weighing and delivery of hogs either to meat processors (i.e., Monterey, Purefoods or Swift) or brokers/stockyards situated in Tondo, Bitas, or Taguig Food Terminal.

5. Institutions

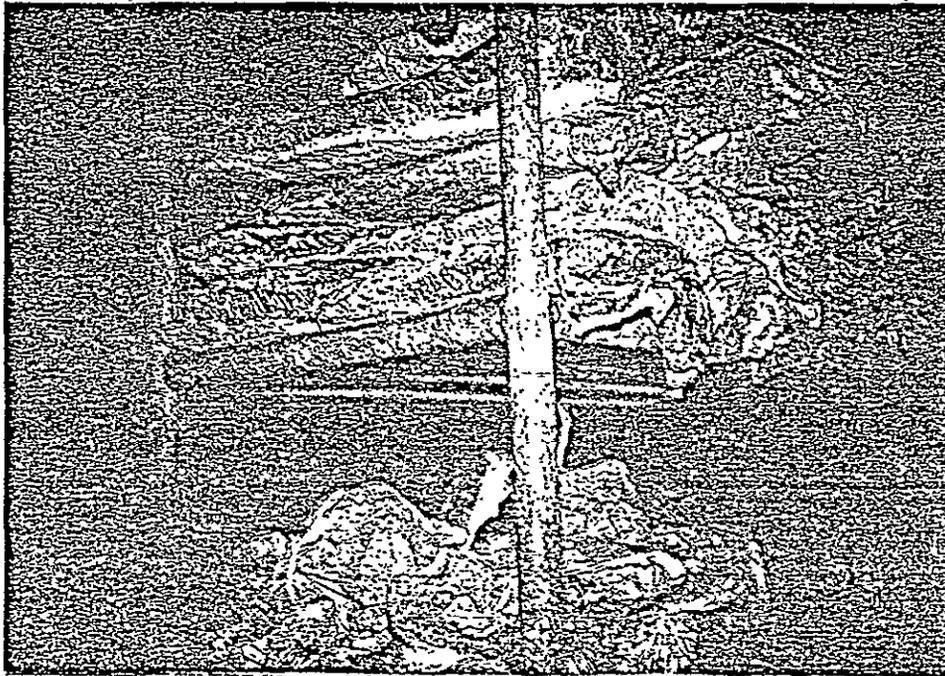
The major public sector institutions which affect the hog industry include the Department of Agriculture's Quarantine Veterinary Services and the National Meat Inspection Commission (NMIC). The Quarantine Services helps maintain the region's status as a Hoof and Mouth disease free area while the NMIC oversees the quality of slaughterhouses. Likewise, the local government through the city or municipal offices influence the condition of the wet meat market places and the availability of slaughterhouse facilities.

By-products of hog raising were not sold. However, three large commercial raisers successfully used hog manure for fertilizing their coffee plantations while one installed a biogas facility whose fuel powered a mechanical dryer for corn. Other raisers have not taken adequate steps to profitably use their hog wastes.

BEST
AVAILABLE



Hogs are dressed in a public slaughterhouse.



Carcasses are placed in a refrigerator room of a meat processing plant

B. Main Causes for Poor Performance

The reasons cited for the past poor performance of the hog industry in Region X included; 1) investors/hog raisers apprehensions as fueled by their fears of business failure; 2) uncertain implications of CARP implementation; 3) impacts of high and changing interest rates on a project with such a long gestation period; and 4) recognition of the minimal support from or occasional adverse actions of the public sector.

Common causes for previous failures of hog raisers fell into four broad categories: 1) technical problems associated with raising animals, especially poor feed rations and diseases, such as hog cholera, enzootic pneumonia and dysentery and shipping animals, especially shrinkage due to shortage of fresh water, care, and storms; 2) consequences of natural calamities, such as crop diseases or droughts which result in shortages of feed ingredients or their unusually high costs; 3) financial constraints; and 4) government controls on the retail price of pork in an inflationary business environment.

Examples of erratic and minimal support by the public sector were: 1) inadequate training; 2) lack of consistent and coherent government programs to benefit hog raisers; 3) absence or under-utilization of common service facilities, such as feed and diagnostic laboratories; and 4) impediments to bringing healthy breeders and equipment into Region X. An allied problem area is the uncertain "peace and order conditions." To that array of problems/constraints is added the high transportation costs for hog raisers located in southern Bukidnon who had to bring various feed ingredients, medicines and veterinary services from CDO and ship the live hogs to CDO. The listing noted above presents formidable challenges to new investors and existing hog raisers. The list underscores urgent need for timely action based on this case study.

C. The "Appraisal Wheel" for Hog Raisers

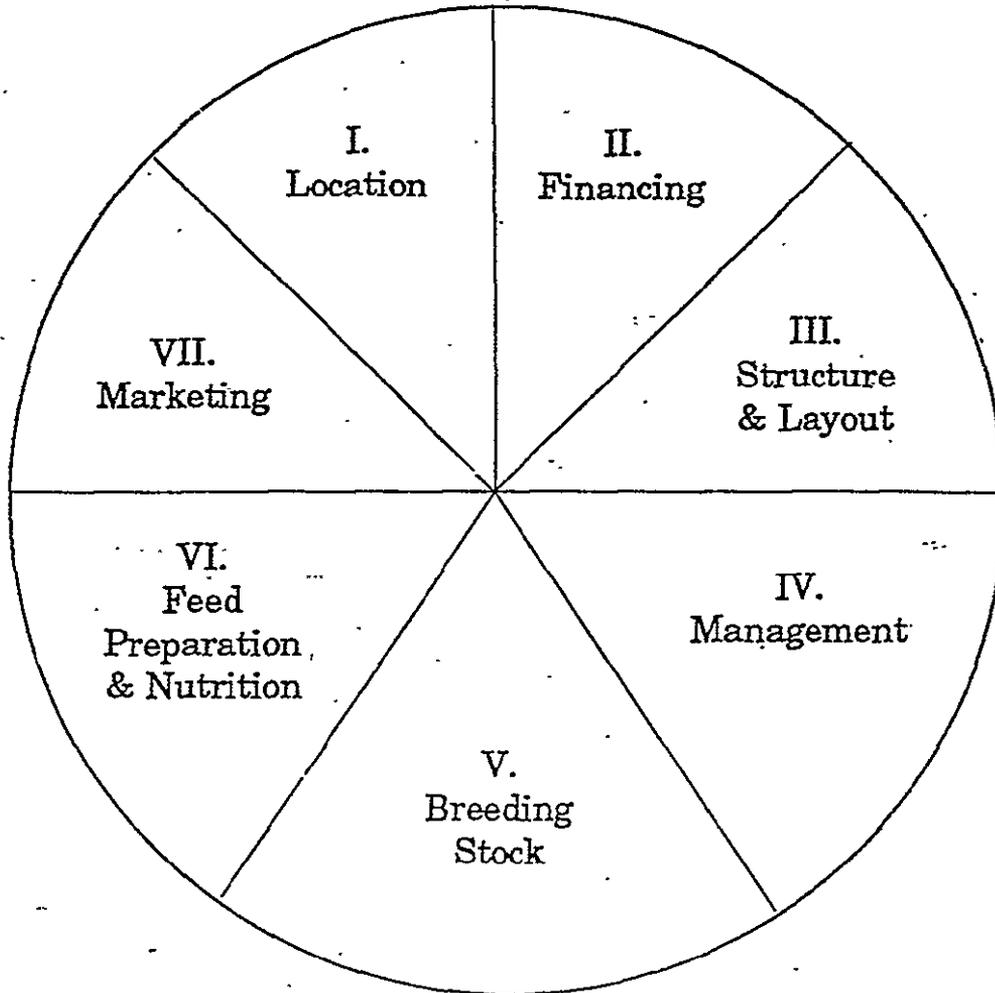
The "Appraisal Wheel" is designed and laid out in an orderly fashion in order to sequence and prioritize considerations for the establishment and maintenance of a profitable hog raising enterprise. These requisites for a profitable hog raising operation are; 1) location, 2) financing, 3) structure and layout design, 4) management, 5) breeding stock, 6) feed preparation and nutrition and 7) marketing (Figure 10.1). The specific topics important to these major considerations are examined below:

1. Location

1.1. Site Specific Factors

a. Elevation - From the health standpoint, it is important to avoid locating the piggery in sites where even occasional flooding occurs because water could carry pathogenic organisms from other areas.

Figure 10.1
The Hog Raiser's "Appraisal Wheel"
(Constraint System)



b. Water Supply - Abundant, fresh, potable water should be available at all times for drinking, cleaning and cooling purposes. Underground sources are preferred over surface water from a river or creek in order to avoid any kind of contamination, intentional or otherwise.

c. Drainage - Gently sloping terrain allows construction of a settling pond or lagoon which facilitates collection and utilization of solids, sludge and liquid. This could facilitate the further processing of waste to methane gas for fuel, fertilizer and irrigation.

1.2. Environmental Factors

a. Ambient Temperature - Optimum performance in all stages of hog production - boars, sows, sucklings, starters, growers and finishers - is directly affected by the temperature to which pigs are subjected. A cool, narrow range of temperature fluctuations is preferred. A sudden temperature change, especially at the beginning of the rainy season, can cause stress and health problems for pigs, especially the young ones.

b. Ventilation - Significant amounts of harmful gasses and dust accumulate inside the buildings. Continuous air exchange as provided by a well ventilated place could efficiently and cheaply avoid this potential problem.

c. Soil pH - Generally, the growth of pathogenic organisms are inhibited or killed by an acidic soil environment. Although no local studies were conducted on this topic, it could be surmised that by locating the piggery in areas with a soil pH of less than or equal to 4.5 could provide a natural barrier to the sustenance of many pathogenic organisms which plague the pigs. It could serve as a natural quarantine procedure.

1.3. Farm-to-Market Road Factors

a. Distance - Although nearness to suppliers, market centers and port are preferred, distance of approximately 10 kilometers from population centers is adequate to avoid possible social and political problems due to offensive gas emissions.

b. Road Condition - With the high cost of road maintenance and notorious delays in road repairs, locate the piggery in areas where access to main roads is easy at anytime.

1.4. Power Supply Factors

a. Type of Supply - Access public utilities to sustain the piggery with appropriately powered generators - like hydroelectric, geothermal, or fossil fuel. Depending on the scale of the project, a methane gas-generated power supply source could provide supplemental power given proper technical assistance.

b. Reliability - Availability of ample, continuous supply of power is required in all areas of hog production such as - water supply, feedmilling, lighting and heating. The dependability of power is related to the profitability of the power supply operation, the capability and concern of people running it, and the perceived profit contribution of the piggery enterprise to the overall business picture of the utility company.

c. Cost - Power supply costs can range from about 0.5 to 1.0 percent of total operating cost.

2. Financing

2.1. Size of Investment Factors

a. Capital Expenditure - The cost of land, buildings, equipment and vehicles eat up at least 50% of total investment capital. Costs depend on such factors as a) location, i.e., the closer to the centers of commerce the more expensive the land and less costly to get construction materials, especially of gravel and sand, b) type of construction materials and c) designs of the buildings.

b. Working Capital It is wise to provide programmed working capital for two years ahead because first breeding takes place approximately three months from the purchase of breeders, ten months from breeding to initial sales and six months to breed all gilts in programmed breeding. Appendix 46 shows a projected cash flow of a 100 sow level hog farm for 18 months.

2.2. Source and Terms of Investment Funds

a. Formal Credit - Financing institution like banks (commercial and rural), investment houses and foreign aid projects are sources of credit. The government is encouraging countryside development projects with incentives to investors. However, these sources are still wary because of a history of project failures. The investor should search for liberal terms of at least five years due to the long gestation period.

b. Informal Credit - Many veterinary drug companies and/or their distributors/dealers grant credit for their supplies. Though terms and mark up vary between suppliers, construction materials and sometimes feed ingredients can be obtained on credit.

c. Own Capital - Ideally this should be the main source of part or all investment capital because of the relatively long gestation period for hog raising and the relatively high cost of external financing. In fact until income from the project is sufficient to support operational requirement and debt servicing, avoid diversion of income to other uses.

3. Structure and Layout Design

3.1. Building Design Building designs should be appropriate for each stage of hog growth because of the high humidity and heat in the tropics. -Heat during the day and cool evenings

stress and affect the performance of the pigs so that a high roof line, monitor type, high angled roof of insulating materials like asbestos or local materials like "nipa" could substantially reduce the radiation and facilitate air exchange. Other design considerations should be tailored to the various stages of hog development.

a. Breeders should have a cool, well ventilated house.

b. Lactating Sows and Nursing Piglets (Farrowing House) - A draft-free house with provision for supplemental heat for piglets and ventilation for sows will minimize such problems as diarrhea in piglets and mastitis in sows. Special care should be taken to properly design and position this key structure which is the indicator of actual piggery capacity.

c. Weanlings (Nursery House) - A draft-free house with supplemental heat provision for optimum performance and to minimize post weaning diarrhea of weanlings is ideal.

d. Growers and Finishers (Growing House) - An open, well ventilated cool area should be positioned nearest to the road to minimize traffic which is a prime source of contamination.

3.2. Waste Disposal and Utilization System This system has caused many conflicts as nearby population continues to grow so that areas once rural become slowly urbanized. Piggery buildings are commonly located near the creek into which all wastes drain. Residents near the creek downstream have valid grounds for complaints. Ideally, waste not only should be disposed of properly by using lagoons or settling ponds but also utilized for methane gas production to run generators and engines that partially or fully meet the farm's energy requirements. Likewise sludge, solids and liquid can be used for fertilizer.

3.3. Adaptability of Layout A modular layout allows for rapid systematic expansion as opportunities warrant.

a. Positioning of Buildings - Longitudinal axis should be oriented east to west to avoid exposing the long sides of the building to the sun's radiation heat as well as to maximize air flow into the building. Meanwhile ample space of at least fifteen meters between buildings should be provided to avoid movement of stale air from the inside of one building into the adjacent one. Preferably, space should be available for expansion at one end of the building.

b. Water Delivery System - Water reservoirs should be provided. Delivery of water can be attained by gravity or booster pumps. There should be a standby power source in case of power failure.

4. Management

4.1. Herd Health Program

a. Quarantine Procedures - The saying, "an ounce of prevention is worth a pound of cure"

is particularly true in hog raising. Simple procedures like the provision of disinfectant dips both for vehicle and men at farm and building entrances reduces the amount of harmful organisms carried into the farm. Also control of stray animals - domesticated and wild - will serve the same purpose.

b. Vaccination - Immunization against specific diseases like hog cholera, pleuropneumonia, etc. is worth the expense because there is no foolproof procedure in avoiding entry of disease organisms.

c. Prophylaxis - Strategic incorporation of effective antibiotics at appropriate age levels is advisable, considering the presence of abundant harmful bacteria, specifically during environmental, nutritional, and physiological stress periods.

4.2. Feeding Regimen A well-balanced, properly mixed feed regimen that meets all the needs for maintenance and growth at different stages of the pig's life is necessary.

Any drop in feed efficiency, can have a great impact in profitability of the operation, considering that 70% or more of the cost of production is accounted for by feeds.

4.3. Husbandry

a. Breeders - Introduction of the gilts and boars at the right age (7 1/2 months) and weight (110 kgs.) will have a direct bearing on their lifetime productivity. If too soon, introduction leads to shorter reproductive life and if too late, lowers efficiency. Meanwhile, for natural breeding, maintain a boar to sow ratio of 1:20. Lactation period should be long enough to allow for involution and preparation of the uterus for the next pregnancy and for development of the piglets to a physiologically independent age. But that period should not be so long as to physically drain the sow and affect her reproductive efficiency (25 to 35 days).

b. Piglets - Whenever possible perform necessary procedures like clipping of needle teeth, ear notching (if used), tail docking (if practiced), and iron injection in one handling to minimize stress for the sensitive piglets.

c. Growers - Avoid "social problems" like ear and tail biting, cannibalism, and fighting by grouping according to sex, age, and weight at 16-20 heads per pen and thereby allowing for an establishment of a natural group order.

4.4. Labor Utilization Depending on the scale of the piggery, job specialization is preferable. Proper alignment of personalities to the different jobs is important because jobs tend to be repetitious and boring. Only love for the job and, most importantly "love for pigs" will sustain efficient worker performance, especially for those involved directly with pigs.

4.5. Marketing/Sales Strategy The capacity of buildings, especially the Farrowing House, are fixed and set up at high costs. Thus, due to the constraint of housing, hog production cannot

easily exploit fluctuations in prices by substantially changing herd size. This is true if production is not tied up to processing.

Another marketing/sales strategy is the production of hog strains with high lean meat percentage that consumers prefer. This in turn could open avenues for marketing of highly priced breeders.

Market/sales strategies include diversifying markets to at least three types of buyers, i.e., traders for live hogs, market stall holders for carcasses and a processing plant. Select market outlets in at least two locations. Find buyers who prefer different qualities of hogs and avoid glutting a particular market.

4.6. Adaptability to Change A more open management style should be explored not only to consider technical advances but cultivation of cooperative spirit with other raisers. Together hog raisers could share solutions to common problems and attain economies of scale in terms of common service facilities like laboratory and research (e.g., development of feed ingredients substitutes), procurement of supplies and feed ingredients, and access to credit.

5. Breeding Stock

5.1. Sourcing of Breeders

a. Breeder Source - Ideally, sources of breeders should be from a supplier farm located in areas with climatic conditions similar to that of the receiving farm in order to avoid severe stress or health problems due for example, to stress which can occur where supplier farm is located in a temperate climate and receiving farm is in tropical climate.

b. Breeder Procurement - Avoid specific, economically important diseases by procuring breeders from "Specific Pathogen Free" (SPF) herds. These specific diseases are kept out by supplying replacements that are delivered by Caesarean section, maintaining strict quarantine procedures and monitoring by periodic testing of the herd for these specific diseases.

5.2. Type of Breeders

a. Pure Breed - The advantage in using this type is the flexibility in production with the use of combinations of specific breeds at levels determined to perform best in the farm. However, maintenance of specific breeds used in the combination have respective strengths and weaknesses particular to each breed, e.g., the strength of "Landrace" lies in its long body as signified by its 16-17 pairs of ribs compared to the usual 14 pairs for others but its weakness is its narrow body and weak pasterns.

b. Hybrid - This type of breeders has the advantage of relatively high productivity resulting from long research by developing specific breeds, called great, great grandparents noted for specific outstanding characteristics like long body, prolificacy, mothering ability, thriftiness, fast

growth and leanness - for the production of gilts and boars of each breed, called great grandparents. These breeds are then designated to produce only gilts or boars, called grandparents which are bred to the opposite sex of another breed for the production of either the mother line or the father line, called the parent stock, which are bred to produce the commercial pig or market hog noted for its commercial value because of the presence of different, outstanding characteristics in one pig (See Figure 10.2).

5.3. High Level of Performance In order to attain high profitability the following performance parameters should be considered:

a. Litter Size - Large litter size, i.e., greater than or equal to 9 piglets born live, will directly contribute to high profitability since each individual pig born alive constitutes an individual production unit.

b. Fast Growth Rate - The soonest each individual pig reaches market weight the more individuals could be passed through building units such as nursery and growing houses thereby utilizing these more efficiently.

c. High Percentage of Lean Meat - Preference of consumers for leaner carcass will put pigs with higher percentage of lean meat at a better competitive position.

d. Adaptability to Wide Range of Environment - Without the benefit of controlled environment, pigs, especially breeders that adapt well - by maintaining performance levels - even under extremes in climatic conditions, particularly temperature and humidity, would be productive longer than those that are not.

Another factor is the adaptability to intensive production practices where shorter farrowing intervals, (number of days between farrowings), is aimed at and prolific boars, are fully utilized.

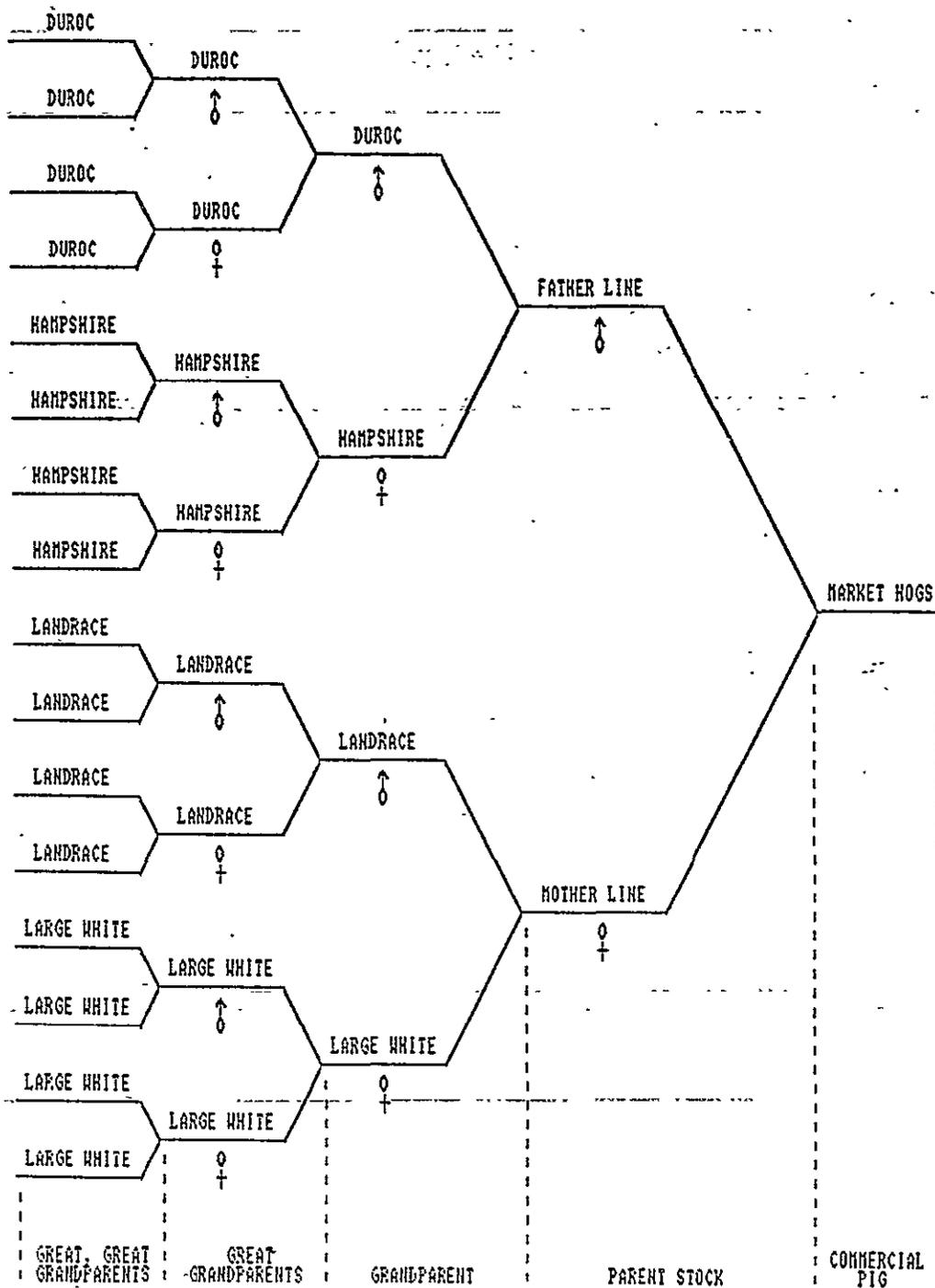
e. Stress Resistance - Mortalities due to fights, congestion during transport, and heat stroke could be avoided by using hardy breeders

6. Feed Preparation and Nutrition

6.1. Feedmill Equipment and Bodega To attain homogeneity of feed mixture, the horizontal feed mixer is preferable. Micro-mixer should be used to attain uniform dispersion of micro ingredients, such as antibiotics, vitamins/minerals mixture, and growth promotants in the feeds. Also, an appropriately designed molasses mixer should be installed to avoid lumps if this ingredient is used.

On the other hand, the bodega should be large enough to hold a three-month supply of corn. For this reason, bulk handling equipment like conveyors and silos are advisable.

Figure 10.2 Illustration of the Hybrid Process



6.2. Availability and Cost of Main Ingredients The main ingredients of corn grains, soybean meal, fish meal, first and second class rice bran, and corn bran should be available for mixing year-round at a cost low enough to earn a net of 20% over direct cost of production.

6.3. Availability and Cost of Substitutes In order to cushion the effect of high prices and limited or lack of supply of the main ingredients during lean months, substitutes such as cassava, sweet potato, cowpea, ipil-ipil leaf meal, sorghum, and whole soybean should be used. The amounts available should be sufficient to fill any deficiency or replace the main ingredients during lean months at a cost comparable to the use of main ingredients replaced.

6.4. Feed Formulation Program On one hand, a "Least Cost Formulation Program" should be available to react to substantial changes in prices of feed ingredients. On the other hand, a flexible program should be available to take advantage of the anticipated peak demand seasons like Christmas, New Year, and fiestas by hastening growth (feeding high density rations) or by preparing for low price season like Holy Week and semestral breaks by delaying growth (limit-feeding and by feeding of low density rations). In this connection, there should be provisions to handle backlog of market hogs in the form of multipurpose concrete area for housing pigs, drying ingredients, storage, etc.

7. Marketing

7.1. Type of Competitors

a. Input End - Availability of cheap, abundant substitutes and by-products of corn and rice milling could substantially reduce costs of production.

Industrial processors and traders are the main competitors in the purchase of these substitutes and by-products as well as other hog and poultry raisers and to some extent, dairy and fattening cattle raisers.

b. Output End - between 70-80% of all hogs slaughtered in the public slaughterhouses in Cagayan de Oro and Cebu cities are supplied by backyard raisers. The main reason for this is the lower price for backyard pigs (P 24.00-26.00/kg liveweight) against higher price for commercial pigs (P 29.00/kg. liveweight in Cagayan de Oro and P 32.00-P 34.50/kg liveweight in Cebu City). Hence traders prefer the former. However, carcass recovery of backyard pigs is lower (66%) than commercial pigs (72%) and of poorer quality (thick backfat) compared to commercial pigs (leaner carcass).

7.2. Form

a. Liveweight - Hog owners dispose of stocks in this form either at farmgate or broker's holding pen.

b. Carcass - This is the form in which brokers sell to market stall holders.

c. Processed - Canned or packed, meat and meat products are processed by canning plants (like Virginia Foods, Inc. and Sunpride in Cebu) or medium (like Pine Foods in Cagayan de Oro) and small-scale home processors.

7.3. Terms

a. Cash - this is usually the case if the trader picks up the pigs from the farm. In a tight supply situation, brokers even pay in advance by one or a few days.

b. Delayed Payment - Often this term is applied by brokers or processing plants to shippers - whether farm owners or traders - who deal in a sizable number. The extent of the delay depends on the supply situation.

c. Offsetting - Traders who supply feed ingredients to the farm offset the value of these against hog sales. This arrangement is usually done by trustworthy traders/brokers located in places far from the market and supply centers to minimize selling expenses and to take advantage of their contacts.

d. Consignment - This is usually the arrangement between the seller and processors or vendors.

7.4. Transporting This factor is determined by the form of the end product and mode of handling, namely;

a. Liveweight

Picked-up: Truck/Jeep/Trailer - The buyer picks up the hogs at the farm.

Delivered: Truck/Jeep/Trailer - Hog raiser delivers to the broker's or owner's holding pen either for shipment or sale.

Ship - Hog raiser ships hogs if the number is sizable and the price at the destination is higher than the local price considering all costs involved in shipment.

Plane - This mode is utilized to market high priced breeders to buyers located far from the suppliers, especially if transport by truck is impractical or risky to the health of hogs,

b. Carcass - Owner uses a meat delivery van from the slaughterhouse to the market vendor or grocery store.

c. Processed - Depending on the finished product, transport is done by means of;

- * Refrigerated van - for packed and frozen meat and meat products, or
- * Truck/panel haulers - for canned meat and meat products.

7.5. Outlets - the following are to be considered:

a. Number - several outlets should be tapped in order to be able to realize the best prevailing price.

b. Nature - prefer outlets that cater to upper and middle income customers (i.e., hotels, first class restaurants, and grocery stores) because they offer a better price than the public market vendors.

c. Capacity - select outlets appropriate to take the whole delivery which is especially important for shippers with large quantities.

D. Key Factors per Stage of Sow, Boar and Hog Growth Patterns

The varied growth stages of sow, boar, and hogs require not only different responses and a special alertness to prevent impending problems. The key factors relative to each stage of growth include; 1) duration, 2) main feed requirement, 3) cost components, 4) facilities used and 5) common problems. Tables 10.1, 10.2 and 10.3 summarize each factor per stage-- as guidelines to prospective hog raisers as well as a reminder checklist for existing hog raisers.

The subsequent set of tables, 10.4, 10.5, and 10.6 display ideas for improvements per stage of hog productivity relative to the interested parties involved in this industry, such as individual raisers, groups of hog raisers, academe, and public institutions. The abbreviated tables are meant for quick understanding and targeted implementation.

E. Problems/Opportunities

The problem and opportunities for the hog industry can be seen from four broad categories which correspond to the major interest groups, namely government agencies, academe, group of raisers- and the individual piggery. The matrices--presented in Tables 10.4, 10.5-and-10.6-highlight key points discussed below.

The many opportunities for the public sector--to--make significant improvements can be viewed in terms of: a) improving the regulatory environment so as to maintain this "hoof and mouth" free zone yet accelerate the introduction of improved breeds; b) search for donor and to set-up a breeding center, animal disease diagnostic laboratories and feed laboratory in CDO; and c) actively dialogue with hog and poultry raisers regarding immediate, crucial problems such as Mindanao animal raisers' lack of access to cheap imported corn while Luzon raisers have been given access to such imports.

Table 10.1 Key Factors per Stage In the Sow Growth Patterns^{1/}

Key Factors	1 Aquisition of Parent Stock	2 Quarantine of New Stocks	3 Integration of New Stocks	4 Breeding & Gestation	5 Lactating	6 Dry	7 Market ^{2/}
1 Duration & No. of Days Between	150 days	60 days	30 days	114 days	28-30 days	10 days	1095 days
2 Main Feed Ingredients	MC - 39% ^{3/} SBM - 13% ^{4/} RB - 35% FM - 5%	MC - 39% SBM - 13% RB - 35% FM - 5%	MC - 42% SBM - 10% RB - 35% FM - 5%	MC - 48% SBM - 12% RB - 35%	MC - 37% SBM - 18% RB - 35%	MC - 37% SBM - 18% RB - 35%	
3 Cost Factors	Quality breeder Transportation Insurance Support facilities Labor	Labor Technical services Feed medication	Labor Technical services Feed medication	Labor Feed medication Supplementation	Labor Feed medication Cooling system	Labor Vaccination Supplementation	Transportation
4 Facilities Used	Non-slip hauler Watering equipment Unloading ramp	Isolation house Testing laboratory equipment	Isolation house Testing laboratory equipment	Breeding pen	Draft free farrowing house Farrowing crate	Dry sow pen	Weighing scale & crate Hauler
5 Common Problems	Expensive stock Sourcing Documentation Selection Adaptation Disease carriers	Adaptation Diseases	Diseases Development of immunity Fighting and resulting damage	Failure to conceive Diseases Accident like slipping	Inadequate air exchange Low feed intake High temperature Low milk production	Failure to return to heat Silent heaters Lameness	Accident like slipping Low price "Thin sows" Condemnation at slaughter due to diseased parts like liver or lungs

1/ Stages 4 to 6 are repeated with every breeding period

2/ Estimated age when culled for market is about 3 years after about 7 farrowing periods

3/ White and yellow corn are complete substitutes, i.e., 1:1

4/ Abbreviations include; MC - Milled Corn, SBM - Soybean Meal, RB - Rice Bran and FM - Fish Meal

Source: Experiences of the author.

Table 10.2 Key Factors per Stage within the Boar Growth Patterns

Key Factors	1 Aquisition of Parent Stock	2 Quarantine of New Stocks	3 Integration of New Stocks	4 Breeding	5 Market
1 Duration & No. of Days Between	150	60	30	505	730
2 Main Feed Ingredients	MC -39% SBM -13% RB -35% FM -5%	MC -39% SBM -13% RB -35% FM -5%	MC -39% SBM -13% RB -35% FM -5%	MC -42% SBM -10% RB -35% FM -5%	
3 Cost Factors	High quality stock High transportation costs Insurance premium	Labor Technical services Feed medication	Labor Technical services Feed medication	Labor Technical services Vaccination and supplementation	Transportation Labor for castration if necessary Medication/treatment if castrated
4 Facilities Used	Watering equipment Unloading ramp Non-slip hauler	Laboratory equipmen and culture media Isolation house	Laboratory equipmen and culture media Isolation house	Boar pen Breeding area Laboratory equipmen for semen examination	Weighing scale and crate Hauler
5 Common Problems	Sourcing Documentation Selection Adaptation Disease carriers Expensive stock	Adaptation Diseases	Diseases Development of immunity Fighting & resulting damages	Short penis Short penetration time Loss of aggressiveness	Low price Boar odor

1/ Abbreviations include; MC - Milled corn, SBM - Soybean Meal, RB - Rice Bran, and FM - Fish Meal

Source: Experiences of the author

Table 10.3 Key Factors per Stage of Hog Growth Patterns

Key Factors	Pre-starter						
	1 Early Nursing	2 Late Nursing	3 Weanling	4 Starter	5 Grower	6 Finisher	7 Market
1. Duration & No. of Days Between	0-9	10-30	31-40	41-75	76-146	147-184	184-186
2. Main Feed Ingredients	SMM - 16% CT - 21% SM - 45%	SMM - 32% CT - 32% SM - 20%	SMM - 32% CT - 32% SM - 20%	SUM - 32% FM - 5% MC - 53% RB - 10%	SUM - 19% MC - 39% RB - 36%	SUM - 7% MC - 45% FM - 5% RB - 35%	
3. Cost Factors	Prevention & treatment medication High quality ration Supplemental heat provision Intensive labor for piglet care	Prevention & treatment medication High quality ration Supplemental heat provision Intensive labor for piglet care	Prevention & treatment medication High quality ration Supplemental heat provision Intensive labor for piglet monitoring & feeding	Feed medication for growth, deworming & disease prevention Labor for sizing castration & vaccination High density ration	Unlimited feeding	High volume feeding	Transportation Shipping costs, shrink and/or mortality
4. Facilities Used	Enclosed farrowing house Farrowing crates	Enclosed farrowing house Farrowing crates	Flat deck or slotted floor Automatic waterers Self-feeder	Partially slotted floor Automatic waterers Self-feeder	Well ventilated, open building Nipple waterers Self-feeders Water sprinkler for cooling	Well ventilated, open building Nipple waterers Self-feeders Water sprinkler for cooling	Weighing scale & crate Loading ramp Truck hauler
5. Common Problems	Scouring piglet Husbandry break down Accumulation of harmful gases Draft & cold evenings Starvation due to mastitis Low individual birth weight (less than 1.0 kg)	Runted & weak piglets Lapses in monitoring & care of piglets Low milk supply from sow Insufficient air exchange Draft & cold evenings	Post-weaning scours Growth lag due to weaning stresses Respiratory problems due to deficiency of air exchange Draft & cold evenings	Diseases Runting	Diseases Runting High temperature from 9:00 am to 3:00 pm Excessive emission of offensive manure odor	Diseases Runting Waste disposal High temperature from 9:00 am to 3:00 pm Excessive emission of offensive manure odor	Accident like slipping leading to fracture, bruises or lameness Price fluctuations Price manipulation by brokers/buyer syndicate Inconsistent carcass quality, i.e., color, leanness, marbling High shrink on shipment Injuries due to rough handling at brokers holding pen Delayed withdrawal from the pier to holding pen Condemnation at slaughter of diseased parts like lungs and liver

1/ Abbreviations include: SMM - Soybean Meal, CT - Corn Tritic, SM - Skim Milk, MC - Milled Corn, RB - Ricebran and FM - Fish Meal

Source: Experiences of the author

Table 10.4 Opportunities for Improvement per Stage In the Sow Productivity Cycle
by Type of Interest Group

Interest Groups	1 Acquisition of Parent Stock	2 Quarantine of new stocks	3 Integration of new stocks	4 Breeding & Gestation	5 Lactating	6 Dry	7 Market
Individual Raiser	Breeders with faster growth but leaner meat	Upgrade technical proficiency of personnel Set up disease monitoring system	Upgrade technical proficiency of personnel Vigilance in monitoring presence of disease	Lower recycle rate Higher farrowing rate	Less deaths Better lactation performance Higher weaning litter size and weight	Improved recognition of heat signs Fewer dry days	Higher dressing percentage (recovery) Better carcass quality
Groups of Raisers 1/	Larger genetic base Economies of scale in purchasing	More comprehensive monitoring system Availability of better trained personnel	More comprehensive monitoring system Availability of better trained personnel	Breeding performance improvement by sharing ideas	Improved lactation performance Percentage of mortality reduced Much improved weaning & litter size	Shorter dry period and improve aptitude to recognize heat signs	Improved quality of carcass Much higher carcass recovery Economies of scale in marketing
Academe	Screen for breeds with improved feed efficiency performance	Design better monitoring system for diseases Identification & diagnosis of problem areas Develop training/apprenticeship in quarantine technique	Improve existing monitoring system Develop new methods for integration	Design program for better genetic combination Determine relationships between desired characteristics & genetic make-up	Developing better husbandry for the lactation period	Design feeding regimens to reduce the dry period	Design methods for monitoring and evaluating of meat quality, i.e., shrinkage, color, leanness
Public Sector	Reduce regulations that hamper introduction of improved parent stocks Find funding sources or donor projects for providing improved parent stock	Strict implementation of quarantine procedures at the piggery Restrict entry of diseased hogs	Distribute research literature on improved integration procedures	Design a program for distributing improved breeds	Disseminate literature on approaches to better lactation performance	Distribute research literature on ways to reduction of dry period	Set-up city auction market Actively implement regulations for slaughterhouse procedures Improve slaughterhouse facilities yet reduce cost of slaughtering Improve sanitation condition in retail markets

1/ Opportunity to learn from each other and share solutions to problems.

Source: Author's experience

Table 10.3 Opportunities for Improvement per Stage in the Boar Growth Patterns by Type of Interest Groups

Interest Groups	1 Aquisition of Parent Stock	2 Quarantine of New Stocks	3 Integration of New Stocks	4 Breeding	5 Market
Individual Raiser	Breeders with faster growth but leaner meat Boars that are easy to handle yet aggressive	Establish monitoring system for diseases Develop technical proficiency of personnel	Set up better monitoring system for diseases Improve technical capabilities of personnel	Training of boars for artificial insemination	Value added by small scale processing
Groups of Raisers	Economics of scale in purchasing of breeders	More comprehensive monitoring system Availability of better trained personnel	More comprehensive monitoring system Availability of better trained personnel	Swapping of boars to broaden genetic base Mating of the best performing boar to the higher performing sows in the herd	Set up common processing plant - slaughter to packaging
Academe	Determine breed lines most adaptable to local condition Screen for breed with improved feed efficiency performance	Design better monitoring system for diseases Identification and diagnosis of problem areas w/ regard to performance of newly acquired stocks under local conditions	Improve the existing monitoring system for diseases, adaptation to local condition	Design program for better genetic combination Determine relationship between desired characteristics, leaner meat, adaptability to intensive production system	Design methods for monitoring & evaluating meat quality, i.e., boar odor, color, leanness, etc.
Public Sector	Reduce regulations that hamper introduction of improved parent stocks Find funding sources or donor projects for providing improved parent stocks	Restrict entry of diseased hogs Strict implementation of quarantine procedures at the piggery	Distribute research literature on improved integration procedure	Design a program for distributing improved breeds	Conduct training for meat processing Disseminate literature on causes of boar odor

Source: Author's experience

Table 10.6 Opportunities for Improvement per Stage in the Hog Growth Patterns by Types of Interest Groups

Interest Groups	Pre-starter						
	1 Early Nursing	2 Late Nursing	3 Weanling	4 Starter	5 Grower	6 Finisher	7 Market
Individual Raisers	Reduction of deaths due to crushing Minimize diarrhea cases in piglets Minimize cases of mastitis, infection of uterus & lack of milk in newly farrowed sows	Minimize cases of weanling piglet due to low milk intake Increase sow milk production	Reduction of post-weaning growth lag Minimize cases of runtling and diarrhea	Establish more uniform growth by proper feeding, sizing and grouping	Establish more uniform growth by proper feeding, sizing and grouping Provision for appropriate cooling system	Establish more uniform growth by proper feeding, sizing and grouping Provision for appropriate cooling system	Production of better quality carcass, i.e., more percentage of lean, less watery carcass marbling quality Higher carcass recovery Absence of boar odor
Groups of Raisers	Economies of scale in the purchase of anti-diarrheal medicines Set up of common service facilities like diagnostic laboratory and laboratory for sensitivity testing Utilization of trained technicians	Economies of scale in the purchase of anti-diarrheal medicines Set up of common service facilities like diagnostic laboratory & laboratory for sensitivity testing Utilization of trained technicians	Economies of scale in the purchase of medicines high priced but low volume ingredients like skim milk, synthetic amino acids Hiring of common consultant and technicians, e.g., veterinarian, medical technologist	Economies of scale in purchase of feed ingredients Set up of common service facilities like warehouse, feedmill, delivery vehicles	Economies of scale in purchase of feed ingredients Set up of common service facilities like warehouse, feedmill, delivery vehicles	Economies of scale in purchase of feed ingredients Set up of common service facilities like warehouse, feedmill, delivery vehicles	Economies of scale in shipment, sales transactions Set up of common service facilities for slaughtering, processing, storing, transporting & marketing
Academe	Research on prevention & control of diarrhea Improvement of livability	Establish program of treatment & control of piglets' diarrhea Improvement of weanling weight	Establish program for prevention & control of post-weaning diarrhea Reduction of post-weaning growth lag	Feeding regimen for uniform & efficient growth	Research on feed ingredient substitutes & supplements Research on more efficient feeding regimen Research on flexible feeding program to take advantage of anticipated price fluctuation	Research on feed ingredient substitutes & supplements Research on more efficient feeding regimen Research on flexible feeding program to take advantage of anticipated price fluctuation	Monitoring of carcass quality, i.e., boar odor, leanness in relation to genetic make-up, feeding program & formulation
Public Sector							Strict observance of meat inspection procedures Close monitoring and evaluation of diseases observed at slaughter Close monitoring and inspection of incoming animals for slaughter and evaluation of results in relation to origin Establish units to collect and disseminate price information

The research opportunities by academe should go beyond solving technical concerns, such as feed substitute crops with regular provision of those substitutes for hog farm commercial trials. A proposal of this nature has good prospects of receiving funding.

Local attitudes toward keeping "secret" in the business of hog raising and marketing urgently need to be changed.

Unfortunately, few examples of continuous interaction or "cooperation" among hog raisers can be found even though the potential benefits are well known. Economies of scale in purchases, common voice for advocating needed changes, and rapid solutions to problems which another raiser has already solved are among the benefits. Perhaps cooperation can emerge around a "selfless" NGO that would provide group services in an unbiased, equitable manner, at least until trust is built-up.

F. Agenda for Action and Research

1. Laboratory and Breeding Centers

The DA should prepare a feasibility study for a building complex to house a laboratory and breeding center with artificial insemination, boarpool and breeder propagation units. Then, DA, with bacteriological, diagnostic and feed analysis facilities would assist in the formation of an association or a cooperative of intended end-users-livestock and poultry raisers in coordination with an NGO, such as Oro Chamber. At the association formation stage the DA could generate interest in the raisers through regular technical seminars. The purpose for the seminars include: a) presenting new technologies; b) discussing common problems and solutions among raisers; and c) identifying credible leaders from among whom the raisers could select an ad hoc committee to work with closely with the DA.

Considering the large capital outlay necessary for the establishment and operation of this laboratory and breeding center, the government should seek foreign grants with long and liberal terms.

Establishment and operation of the Center, would have the following economic and social benefits to the region and ultimately the nation, namely: 1) quality breeders would be available at affordable prices thus production of quality pork within the reach of not only medium and large raisers but also small commercial and backyard raisers; 2) disease prevention and control would be effective and less costly, thereby making operations of raisers more profitable and encourage expansion and more investments in this sector. Ultimate beneficiaries would be the consumers as well as the local labor force given increased employment opportunities; 3) operations would be more efficient with the availability of quality ingredients and reduction of the adulteration of feed ingredients; and 4) technology transfer would be hastened with the establishment and strengthening of the association of hog and poultry raisers.

2. Production and Utilization of Substitute for Corn and Protein Ingredients

The DA should actively promote these indigenous substitutes in coordination with the Philippine Information Agency (PIA) by hastening technology transfer through the establishment of extensive demonstration farms.

The NGO like Oro Chamber should encourage hog/poultry raisers to make contracts with crop growers or traders or for the latter to establish buying stations for these substitute crops as a means to encourage production. This step would lead to more stable prices for ingredients, preserve precious foreign exchange, and afford more flexibility to farmer-producers. Substitutes like cowpea would also benefit the ecological balance with its soil benefit as a legume.

3. Processing of Frozen Meats and Meat Products (Packed or Canned)

Technology transfer for this value added step could be done more aggressively through demonstrations and information flyers by NACIDA and PIA with the hog raisers as the targets because their workers' households usually have idle labor farms. Thus increase economic benefits to laborers and more cost-efficient operations.

4. Establishment of More Marketing Outlets

This could be undertaken individually by big raisers or an association of small raisers by making arrangements for the regular supply of hogs to a big outlet in Cebu or Manila. Another approach is to set-up holding pens near these market centers so hogs can recover their shrinkage after shipment. Likewise, this helps avoid any manipulation or pressure by traders at the pier or from owners of rented holding pens who may be collaborating with those traders.

AGRICULTURAL MARKETING ASSESSMENTS: AN OVERVIEW

By Merle Menegay

I. What is a Marketing Assessment?

An agricultural marketing assessment is an inter-disciplinary approach to analyzing the organization, operation, and performance of agricultural commodity systems. It is designed to describe a commodity system; to diagnose its technical, economic, and institutional problems; to prescribe alternative strategies, projects, and policies to improve system performance; and to predict likely consequences of implementing these alternative prescriptions. The assessment is organized as a phased research process (Table 1) and is typically implemented on a regional level.

II. Why is it needed?

The complexity of market organization and operations, the large numbers and spatial distribution of participants in production-distribution-processing-consumption systems, and the unanticipated, yet substantial, impacts of such outside forces as: a) weather, b) government policies, and c) projects, are among the reasons why agricultural marketing research is difficult. Likewise, problems in such marketing systems tend to be inter-related and change form in response to dynamic demand and supply conditions. Problems also vary by location and may differ according to whose perspective one considers, thus making it difficult to anticipate implications or consequences of market interventions. The commodity systems orientation of the assessment is an attempt to operationalize market research techniques in a systematic fashion when dealing with the aforementioned difficulties.

III. Who is involved in a Marketing Assessment?

Three main groups are involved in an assessment; those commissioning it, those implementing it, and the participants in each commodity system.

Ministries of Agriculture and/or Commerce, frequently in conjunction with a donor project, initiate an assessment for a wide variety of reasons. Such assessments are needed in designing a marketing component of a project, in determining promising activities or market interventions, or in providing information to assist policy makers.

University research units, divisions of the appropriate Ministries at the regional/national levels, and market research specialists generally form an inter-disciplinary team to implement the assessment. The inclusion in the team of action-and-research-oriented professionals at the regional level is a key feature of this approach.

Table 1

Phased Research Design and Implementation

Phase	Objective	Sources of Information	Outputs
I	Develop; a) country profile as context within which the market operates and b) target crop/commodity profile as the content of the market	Existing secondary data and previous studies	Reports based on data tabulation for which analysis of trends patterns, and inferences are summarized
II	Develop; a) an overview of the commodity system, b) identification of major problems & constraints, and c) design for Phase III	Interviews with key informants, market participants, and government agencies combined with field observations	Report providing; a) overview of the marketing system, b) statement of market performance expectations, c) identification of problems, and d) initial orientation to Phase III analysis
III	Focus on longitudinal examination of the most problematic components of the system so as to design prescriptions for market participants	Combination of primary and secondary data collection and analysis (including case studies, surveys, and delphi technique; as needed	Report explaining; a) insights into major problem areas and recommendations of alternative strategies, project ideas and/or policy guidelines, and b) review of results and recommendations selected and programmed
IV	Incorporate monitoring and evaluation within the programmed activities from Phase III	Collection of primary data during the process of implementing prescriptive measures	Feedback to implementors regarding corrective actions, impacts, and unforeseen implications of prescriptions

Private entrepreneurs (i.e., wholesalers, retailers, processors, transporters, assemblers, farmers, etc.) and public sector personnel from various agencies, organizations, and institutions who participate in the commodity system are involved in an assessment. They are not only sources of information but also contribute insights, suggest courses of action, and comment on the practical feasibility/desirability of alternative interventions which the assessment suggests are potentially useful.

IV. What is considered in an assessment?

The marketing assessment draws on the structure-conduct-performance paradigm as used in subsector studies. The concept of a subsector is defined as a "meaningful grouping of economic activities related vertically and horizontally by market relationships...". This commodity systems orientation is adapted to and operationalized for the data-scarce research environment of developing countries. Chart 1 illustrates the systems approach with its vertical array of participants who are influenced by an institutional and policy environment and depicts the spatial dimensions of agricultural production-distribution-processing-consumption systems as well as indicates potential entry points for marketing improvements. Marketing improvements can result from technological, infrastructural, institutional, and organizational changes within the system.

The assessment wheel (Chart 2) highlights the major components of the analysis. During Phase II the research team considers the technical characteristics, demand patterns, market organization/operation, spatial network and economic aspects in a sequential order as it develops an overview of the commodity system and identifies its problems. The infrastructure, institutions, and socio-political power aspects affect system performance and are described as encountered. In Phase III the research team focuses on the components most directly relevant to the priority problems determined from Phase II but also reviews the implications of the less relevant components in light of the alternative solutions emerging from this research.

The framework for Marketing Assessment (Table 2) identifies the sequence and nature of the reports during each step of the assessment. The written outputs are complemented by the expanded expertise of the research team which internalizes considerable knowledge, understanding and skill as well as serves as a valuable resource for future research. Other features of the Marketing Assessment are noted in Table 3.

Since the assessment is undertaken as part of an ongoing donor project, the resources and mandate to implement proposed changes are available for immediate action. Thus, rather than being an isolated activity producing reports that are only put on the shelf, the assessment leads to specific actions or changes.

CHART 1. Illustration System Participants in an Agricultural Production-Distribution Processing-Consumption System

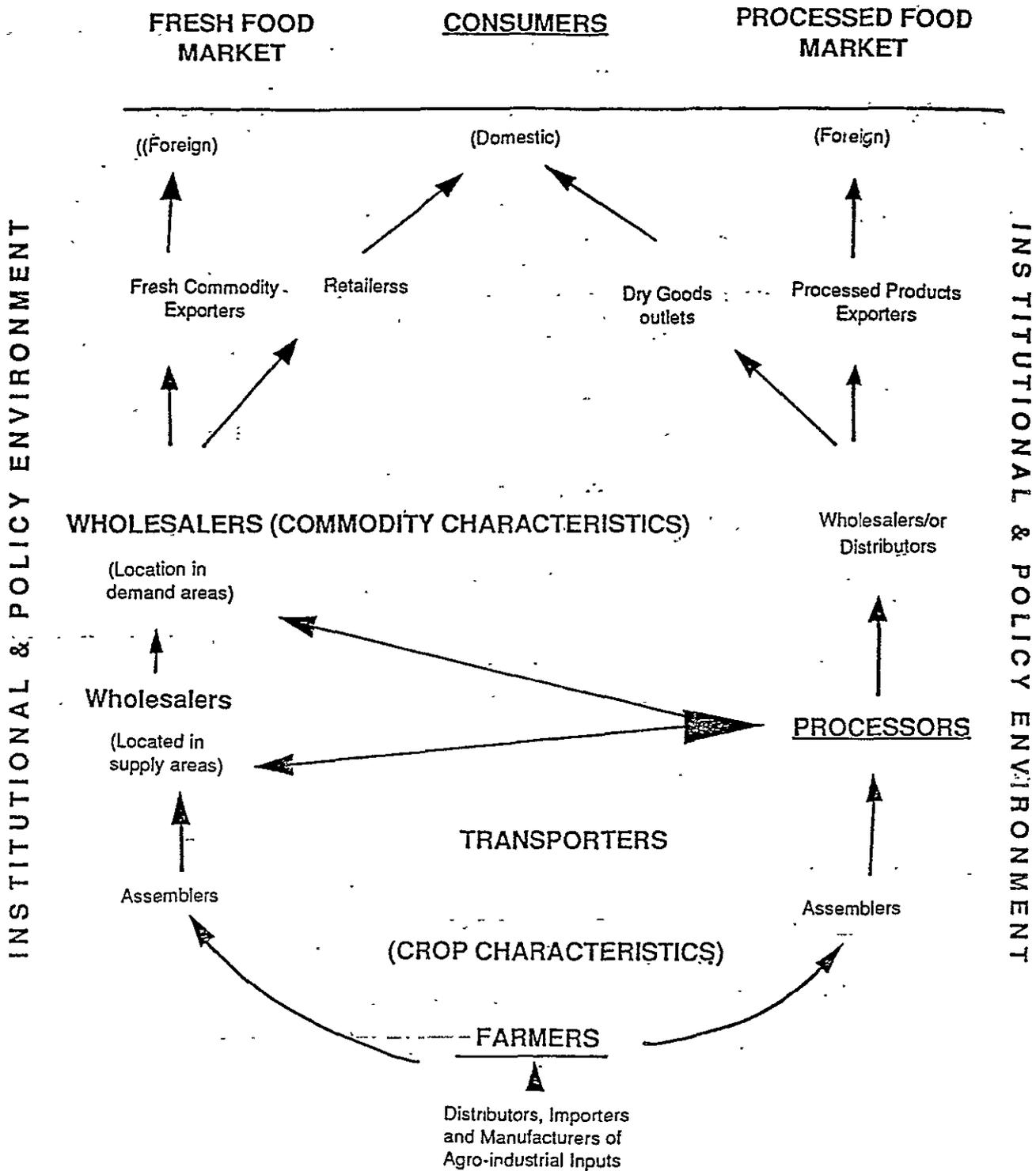


Chart 2. Assessment Wheel

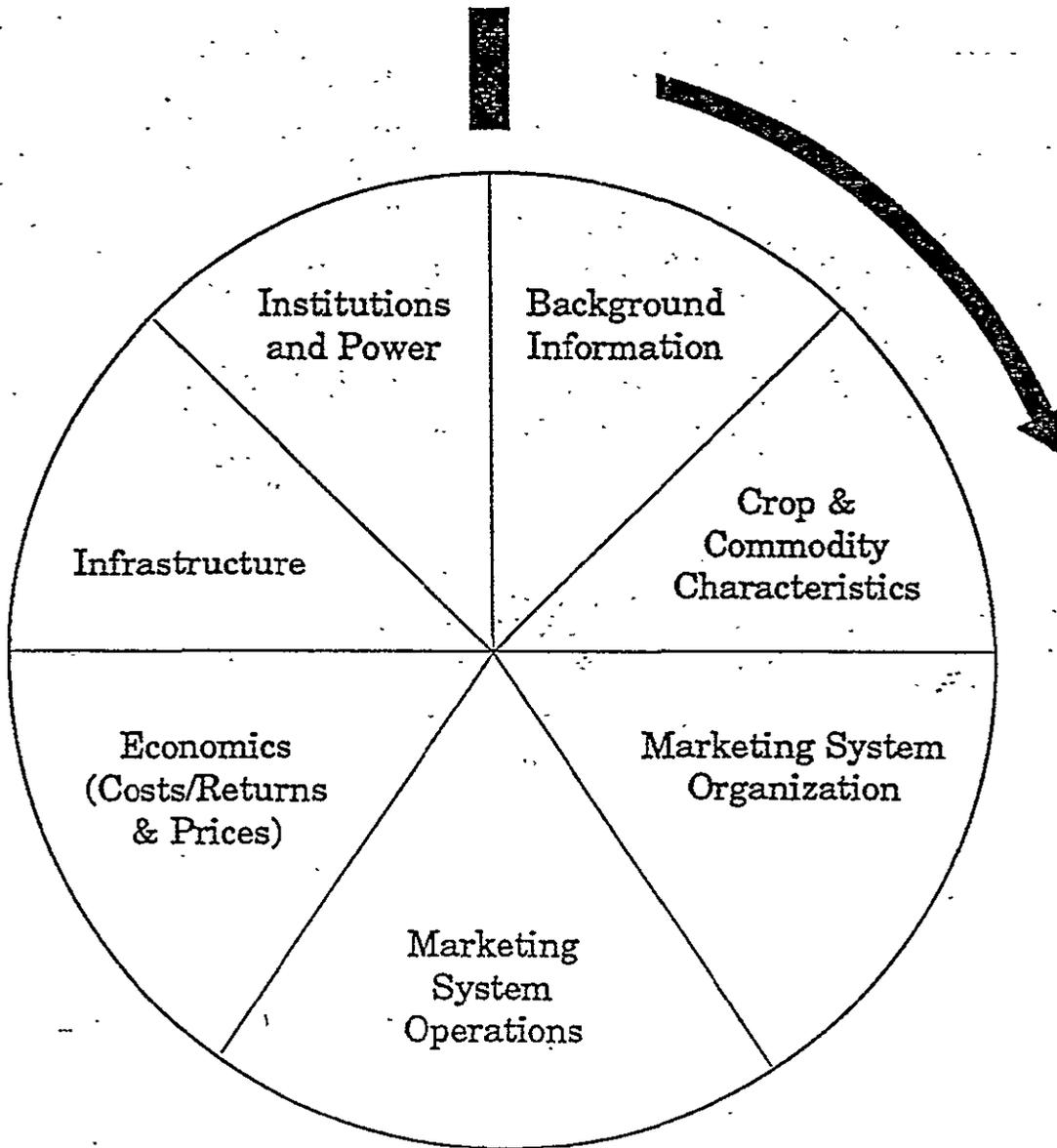


Table 2
Framework for Marketing Assessment

	Phase I ----- 1-2 months	Phase II ----- 2-3 months	Phase III ----- 12 months	Phase IV ----- Indefinite
Time Frame -----				
Objective	Background information	System overview Problem ID & Diagnosis Design In-Depth Analysis	In-depth research on priority problems	Monitoring evaluation of corrective action and policies
Approach	Synthesize information from existing studies according to the guide- line tables	Use a "commodity team" In a rapid appraisal of the commodity system from farm to end-user	Conduct surveys, write case studies, and/or use the delphi-technique	Review the planning, Implementation and Impact of corrective action and policies as Implemented
Data Source -----	Secondary data	Primary data	Primary and secondary data	Primary data
Output -----				
Report size	15-30 pages	15-20 pages/com	20-40 pages/Working Papers	2-3 pages/Monitoring
Content	Tables, graphs, maps Interpretation of patterns and trends	Tables, charts, maps & text according to Assessment Wheel	5-10 pages/Progress Reports Tables, charts, maps, & text of analysis Review of Assessment Wheel components appro- priate to problem	Briefs
Involvement -----	Local university or Institution	Ministry of Agriculture and other agencies Local university Marketing consultant (Review committee)	Same groups as Phase II plus "specialists" appro- priate to problem area	Principal Investigators of the commodity team

Table 3

Features of Marketing Assessments

Feature	Research Phase			Implementation Phase
	I	II	III	IV
A) Effort Exerted				
- Intensity	Low	High	Medium	Low - High
- Personnel	Few	Several	Few - Many	Few
- Relative Cost	Minimal	Moderate	Limited - Substantial	Minimal
B) Time Periods				
	1-2 mo.	2-3 mo.	12-15 mo.	Indefinite
C) Written Output				
	1 Report	1 Report	Progress Reports Working Papers	Monitoring Briefs
D) Expertise Involved				
- Senior	1	1-2	1-3	1
- Junior	1	Few	Several	1

V. What outputs can be expected?

The complete assessment should provide:

- 1) A framework and analytical techniques useful for diagnosing marketing systems problems,
- 2) Analysis of commodity systems as the basis for project ideas, corrective actions, and policy initiatives which are designed to address priority problems within the relevant system, and
- 3) Improved knowledge and understanding of the behavior, role and interrelationships of the system's participants based on empirical findings.

IMPLICATIONS OF THE CONVERSION OF CORN LANDS TO SUGARCANE AREAS IN BUKIDNON

I. Introduction

In August 1989, the National Agriculture and Fisheries Council forecasted a 14.7 percent decline in national corn hectareage primarily due to the shift in corn lands to more lucrative high value crops like sugar. Although substitution to more profitable crops has outright economic benefits, there is a need to closely examine their long-term sustainability and to surface out any negative implications and "tradeoffs" arising from those farm decisions involving shifts in capital investments and labor availability.

The study probed deeper into the reported increasing trend of prime agricultural lands being diverted to sugarcane in Bukidnon prevailing in the early part of 1989. Interviews with farmers and traders in the sample research sites in Don Carlos, Valencia and Malaybalay indicated that substantial areas in these municipalities of Bukidnon were converted to sugarcane production. Although no accurate data were available to show the extent of the shift from corn lands to sugarcane along those areas, the study generated important findings and insights on that situation. It is hoped that government actions would take-off from these analysis to probe deeper on the points raised for the benefit of all concerned groups.

II. Findings

The Bukidnon Sugar Corporation (BUSCO), the only sugar milling company in Bukidnon province, had grouped the province's sugarcane growing municipalities into four (4) zones, and had computed the new areas planted this year (Table 1). The total area planted to sugarcane reached about 26,905 hectares with approximately 19,000 hectares contracted with BUSCO. However, their maximum milling capacity given internal improvements and favorable weather conditions, could cover only up to 21,000 hectares according to the company. If an additional proposed plant were to be established or disassembled and transferred to Bukidnon from another region, it would require at least a year to reassemble such a milling facility. Hence, the implications would be: a) at least 6,000 hectares could not be milled during this harvest season beginning November, 1989, thus causing a loss of P 120 million assuming P 20,000.00 per hectare as production costs for a new crop of sugarcane; and b) "side-effects" experienced in areas of Carmen, a municipality of North Cotabato Province, indicate that where farmers shifted from corn to sugarcane and back to corn, there were increased incidences of downy mildew infestation, severe rat infestation and increased soil acidity.

Other consequences of increased sugarcane area include: a) increased costs of labor (P 25/day to P 35/day) during certain periods; b) idle periods for small farmers growing sugarcane after the fifth month of growth; and c) increased cases of disadvantaged farmers leasing most or all of their small farms to sugarcane growers for 3-5 years.

Table 1 Sugarcane Area and Production Estimates in Bukidnon

ZONES AND MUNICIPALITIES COVERED	Number of Planters	Area Planted		Total Area Planted 1/	Average Ton Cane/ Ha.	Total Production	Percentage share of zones in Total Area Planted		Percent Increase (Decrease)
		New Plant	Ratooned				1989	1988	
		(Ha)			(MT)		(%)		
A. As of November, 1989									
I Quezon	796.00	2,864.49	3,902.05	6,766.54	54.28	370,324.00	25	30	-5
II Valencia, Lantapan Malaybalay & San Fernando	915.00	4,925.45	3,949.79	8,875.24	53.94	478,707.50	33	26	7
III Maramag & Pangantucan	724.00	2,220.00	3,550.27	5,770.27	52.12	311,464.75	21	25	-4
IV Don Carlos, Kitaotao Dangcagan, Kibawe Kadingilan & Damulog	818.00	2,861.10	2,632.20	5,493.30	52.38	288,714.00	21	19	2
	3,253.00	12,871.04	14,034.31	26,905.35	53.18	1,449,210.25	100	100	
B. As of January, 1990 ^{2/}									
				27,406.76	53.18	1,475,854.30			

1/ Sugarcane production requires a growth period of ten months from planting to harvesting.

2/ Exact breakdown of the new total area planted to sugarcane during this date was not available.

Source: Bukidnon Sugar Corporation, 1989

BRIEF REVIEW OF THE HYBRID CORN INDUSTRY IN BUKIDNON

I. Hybrid Seed Industry - Historical Perspective

The three major seed companies operating in Bukidnon are: a) San Miguel Corporation's Hybrid Seed Company, b) Pioneer Seeds, and c) Cargill seeds. Each had entered at a different point in time.

- * The San Miguel Corporation (SMC) started research in Bukidnon in 1979 and conducted demonstration trials through farmer-cooperators in locations where it was not well known. Actual marketing test for its improved varieties occurred in 1985 after SMC seeds were proven resistant to downy mildew and tolerant to drought.
- * In 1982, the Pioneer Hybrid Seeds distributed its hybrid seed in Bukidnon through the Ayala Development Corporation by conducting seed trials and farm demonstrations. The demonstrations compared its hybrid seed varieties with the other hybrid seeds from SMC and Cargill as well as local varieties, such as Tiniguib. Subsequently, it established four service centers; three in the province of Bukidnon, i.e., Malaybalay, Cabanglasan, and Don Carlos and one in Wao of Lanao del Sur province.
- * In 1985, Cargill introduced and marketed the IPB Var.2 and later, the CX757 variety which was bred for tolerance to high soil acidity and drought. Then, in 1988 Cargill moved its Seed Production Plant from Negros Occidental to the municipality of Bangcud in Bukidnon. It became Region X's first seed processor to contract with local farmers for seed multiplication aside from its 25 has. seed production area with MADE farms. Presently, its main service center is in Cagayan de Oro (Agrotex).

II. Findings

Previously, fields along or near the roads were most commonly planted to hybrid corn varieties, especially given their visibility for demonstration purposes, ready access by technicians from the seed companies, and easier access to transportation. However, recently there is a substantial shift of corn area to sugarcane cultivation in the province of Bukidnon, particularly in those areas with access to better roads. Hence, corn area shifted into interior areas or became only a secondary crop. But now production areas have moved to interior areas where traders have been active by promoting the planting of hybrid seed, especially among their financed farmers.

Hybrid seed dealers claim that sales increased despite the shift to growing sugarcane because they have penetrated the more interior corn-growing areas with their salesmen. Consequently, farmers situated in the interior barangays begun shifting from the local Tiniguib to hybrid seed varieties.

III. Distribution

Seed distribution is done primarily by the input dealers. Yet, the seed companies vary in their "styles" of distribution (Figures 1, 2, and 3). Input dealers with shops have fertilizers and chemicals as their primary products while seeds and feed ingredients are their complimentary products. Large traders/financiers also distribute substantial amounts of hybrid seed and inputs to their financed farmers. Though some of these financiers allow farmers to request for specific brands, others gain additional income by promoting the brand that gives them several promotional benefits.

IV. Competition

There has been keen competition among these three major seed companies, each with its own strategies for competing against the others. For example, one company specializes in market promotion schemes, such as discounting and delayed payment for larger buyers, whereas another emphasizes comparative demonstrations and services to growers and dealers. The recent merger of the two major hybrid seed companies, i.e., SMC and Pioneer has created the potential for a substantial decrease in the competitive environment for hybrid seeds.

V. Strategies

Each company employs different strategies such as:

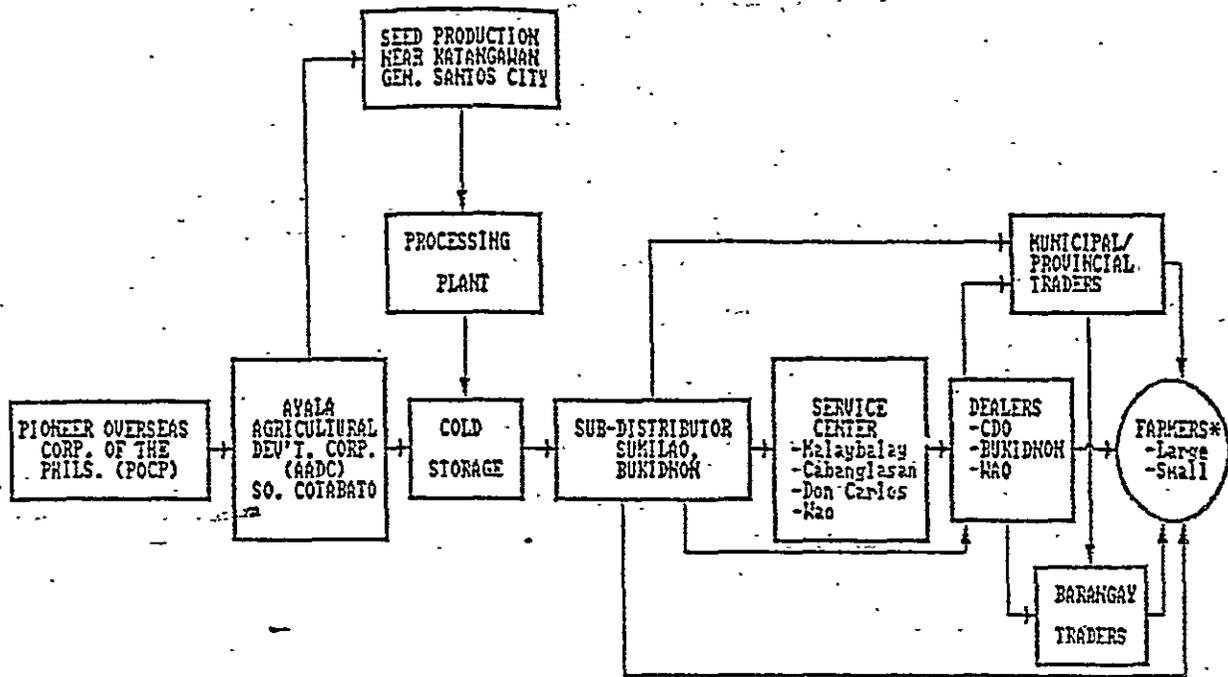
- a. demonstrating product superiority;
- b. setting up new distribution channels/networks;
- c. providing logistics and manpower support for dealers; and
- d. developing a local seed market for dealers to sustain.

Their price range per bag of seed are: SMC - P 620-650/bag; Cargill - P 700-780/bag. and Pioneer - P 820-850/bag. However, actual prices vary around those amounts due to quantities purchased, location, and promotional scheme.

VI. Problems and Opportunities

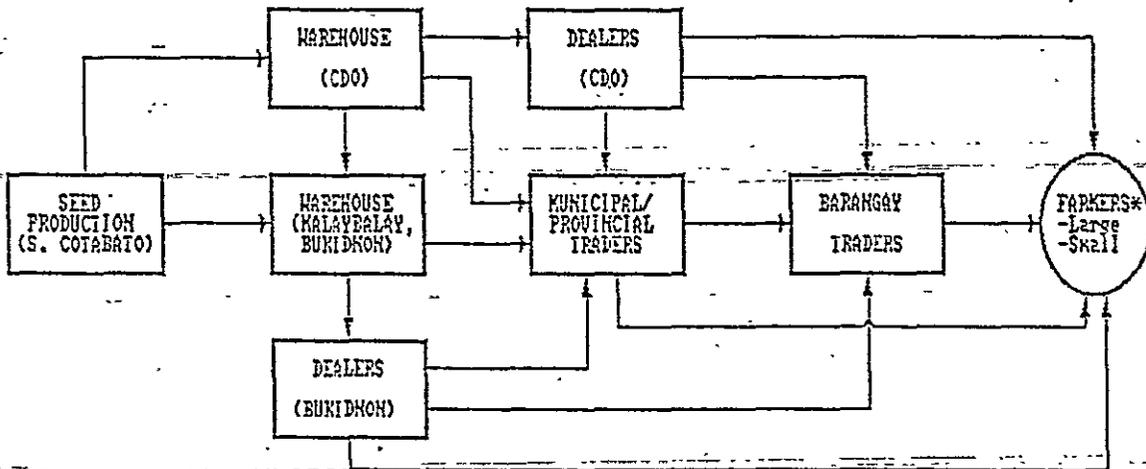
Each company's problems vary somewhat, but generally, difficulty in selling more seeds is due to:

Figure 1 Distribution Channel for Pioneer Hybrid Seeds, 1989



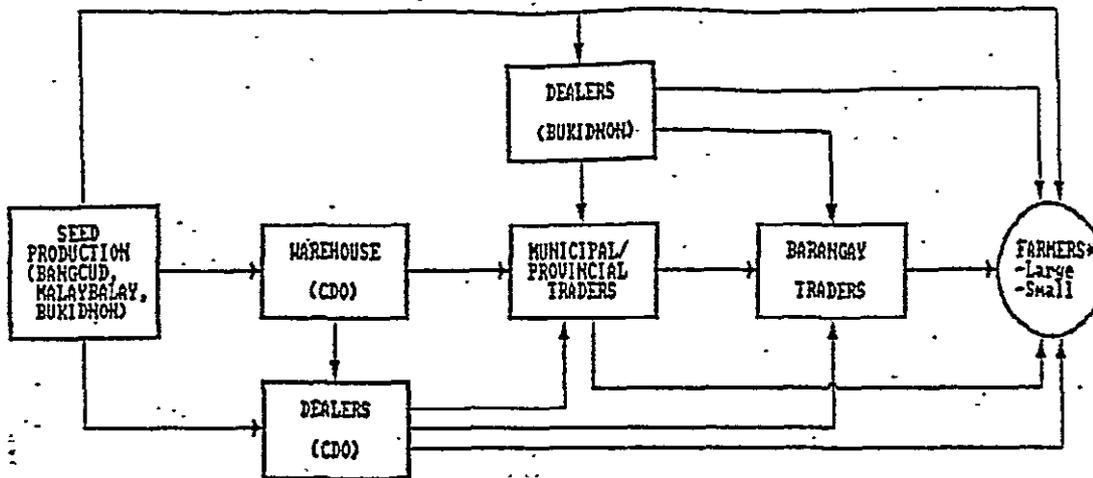
* Large farmers by-pass barangay traders while small farmers buy mostly to barangay traders.

Figure 2 Distribution Channel of SMC Seeds, 1989



* Large farmers by-pass barangay traders while small farmers buy mostly to barangay traders.

Figure 3 Distribution Channel of Cargill Seeds, 1989



* Large farmers by-pass barangay traders while small farmers buy mostly to barangay traders.

- a) competition and prime corn area shifted to sugarcane;
- b) lack of manpower to penetrate the interior areas;
- c) lack of vehicles to deliver to interior areas;
- d) inadequate post-harvest facilities at seed processing center, namely:
 1. low capacity of dryer for corn (w/cobs), and
 2. low capacity of sheller (lacks one unit); and
- e.) high cost of hybrid seeds.

VII. Insights Gained and Issues Raised

According to "Bulletin Today", September 5, 1989, "The joint-venture of the two big hybrid seed companies would be known as Pioneer Hi-breed Agricultural Technology (PHAT)." PHAT will introduce commercially and market hybrid seeds in the Philippines. Their expertise and resources will be combined in improving the productivity and efficiency of the Filipino corn farmers. At present, hybrid seed corn area is planted in only about six percent of the total corn area in the Philippines.

However, if the former competitive environment recently inspired vigorous expansion and sales incentive strategies by both companies, why would those high cost vigorous expansion and farmer support activities continue? The past results have seen substantial gains in shifting Bukidnon farmers from local white varieties to hybrids achieving promising yields under farmer cultivation conditions. Yet, without serious competition, can that shift be sustained? Only the future will tell!

OVERVIEW OF INPUT DEALERS IN REGION X

I. Introduction

Farm inputs such as seeds, fertilizers, and pesticides are commonly used in corn production. An increasingly popular way for farmers to access inputs is through input dealers, i.e., businessmen who invest substantial capital in setting-up a store and purchase stocks of inputs from distributors or manufacturers.

Over the past ten years (1980-1989), there has been a very significant increase in the number of input dealers who established stores in Region X, as noted in Figure 1. In Misamis Oriental Province many dealers entered business in the 1980-84 period whereas in Bukidnon, most were established between 1985-89. This may indicate that the market for inputs has been recently expanding together with increasing production of crops, such as corn and sugarcane, and/or more farmers are shifting from dependency on traders' inputs to independent purchases directly from input dealers.

The purpose of this investigation is to provide an overview of the input situation in Region X as affecting the corn commodity system. Over 25 input suppliers were interviewed in Region X as well as managers in fertilizer company offices in Cebu (Table 1). This inquiry is important for gathering insights into the farmers' ability to rapidly respond to the increased demand for corn.

The increased presence of input dealers is particularly important because they provide an alternative source of inputs to the majority of farmers who have been depending on the capital and inputs on credit from local traders.

The participation of input dealers in the corn commodity system will be discussed in terms of their characteristics, types of corn-related inputs sold, prices, trading practices, services provided to farmers/buyers and pressing problems encountered.

II. Characteristics of Input Dealers

Input suppliers as licensed input dealers (formal business) differs from the traders or others without a license (informal or sideline business) in that they maintain a store, carry regular inventories and sales staff for their business rather than just stock inputs for "suki" farmers prior to the planting season.

Figure 1. Market Entry of Input Suppliers
By Type In The Sample Areas of Region X

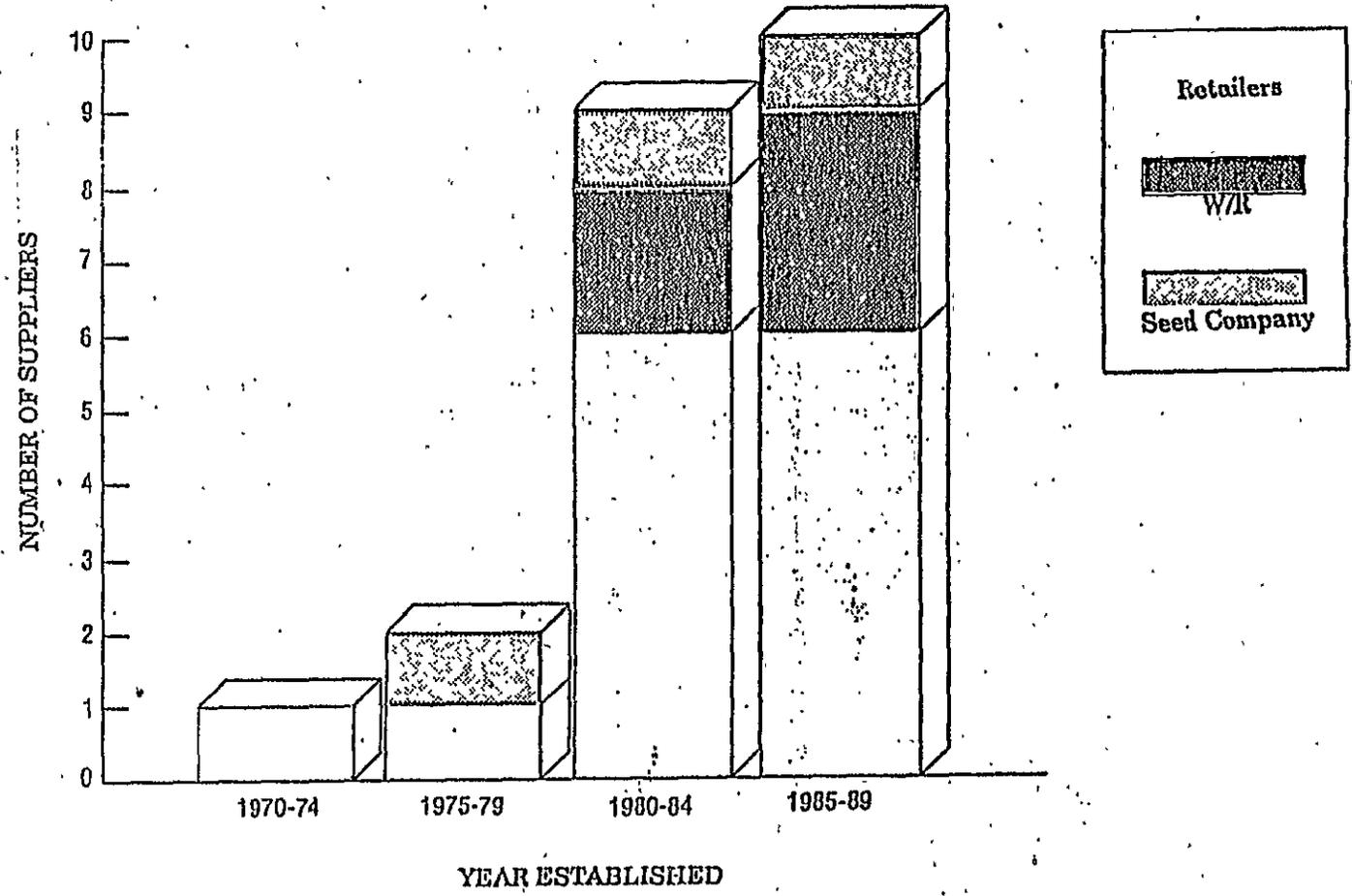


Table 1 Sampling Frame for Input Suppliers in Region X

LOCATION	SUB-TOTAL	TOTAL NO.
A. RETAILERS:		18
Misamis Oriental	6	

Cagayan de Oro City		
Cogon Market	3	
Carmen Market	1	
Lapasan Market	1	
Claveria	1	
Bukidnon	12	

Malaybalay 1/	4	
Valencia	3	
Don Carlos	2	
Maramag	1	
Kalilangan	2	
B. WHOLESALER/RETAIL		
Lapasan, CDO City	5	5
C. SEED COMPANIES:		
Malaybalay, Bukidnon		3
SMC	1	
Pioneer	1	
Cargill	1	
D. FERTILIZER DEALERS:		
Cebu City		2
Philphos	1	
Atlas	1	
GRAND TOTAL:		28

1/ One input supplier is located in Aglayan, Malaybalay.

Input dealers were classified according to the activities they performed as marketing participants, namely: 1) wholesalers, 2) wholesaler/retailers, and 3) retailers. Input dealers as wholesalers buy and sell inputs on bulk basis and are usually located in major trading centers like Cagayan de Oro. Those who are wholesaler/retailers buy stock in bulk but sell either in large or small quantities. Input dealers who sell on a retail basis procure limited amounts, mostly to service small farmers. These are usually located in small towns in the production areas, or in/near city public markets, such as Cogon or Carmen market places in CDO. At these latter sites they service smaller farmers who arrive aboard jeepneys to sell their commodities and buy consumer goods or inputs from the sales proceeds.

~~Some input dealers sold two or more lines of merchandise along with their agricultural inputs. Others combine input sales along with corn trading because this combination is effective in establishing contact with farmers and increasing corn procurement during the harvest period. Others who own trucks are also involved in an input dealership in order to maximize the use of their trucks by backhauling inputs to the production areas after delivering their agricultural commodities to Cagayan de Oro buyers. Some traders who also supply inputs without a license are the subject of major complaints by those with licenses.~~

III. Inputs Applied to Corn

Hybrid corn seeds, fertilizers, and pesticides are the three main corn production inputs supplied by the input dealers. Among the three, fertilizer has the highest volume traded because it is applied to most kinds of commercial crops. In corn alone, it is used on both hybrid and traditional varieties. For corn, hybrid varieties require at least six bags per hectare while fertilizer used on traditional varieties depend on the financial capability of the farmer or whims of traders' input dealers.

Fertilizers most commonly sold by sample input dealers for application on corn were: Complete (14-14-14), Ammonium Phosphate (16-20-0), Muriate of Potash (0-0-60), and Urea (46-0-0). Less popular types of fertilizers sold for corn production include Di-ammonium Phosphate (18-46-0) and Ammonium Sulfate (21-0-0).

Input dealers sell mostly San Miguel, Pioneer, and Cargill brands of corn seed. The varieties these companies mostly sell are yellow corn with particularly high yield potential and resistance to local diseases.

Pesticide use is minimal, depending on the degree of damage caused by the insect pests in corn.

Application of lime is also practiced because the soils of Bukidnon are acidic in nature. Two major sources of lime include Manolo Fortich, Bukidnon and areas near Don Carlos. Farmers pay up to P 600/ha for the lime, depending on their proximity to the sources of lime.

IV. Prices

Brand, especially for hybrid corn seed, was the one important consideration, vis-a-vis, the price of these inputs. Among the three major brands of hybrid seeds, Pioneer has the highest price in the market (Table 2). Seeds in interior locations, such as Kalilangan, generally were higher priced than in more accessible places, such as Malaybalay.

Prices of fertilizers varied mostly across grades with some price differences between brands (Table 3). Atlas brand generally earned a higher price than other brands for comparable grades.

Regardless of brand and/or grades, the location of input dealers causes some price differences (Table 4). Prices in Cagayan de Oro were the base or reference prices since all inputs initially came to and were traded in this city. Consequently, selling prices tended to increase with the greater distance of input dealers from Cagayan de Oro because of the additional transportation cost incurred (Table 5).

V. Trading Practices

The majority of sample input dealers (61%) procured hybrid seeds from the distribution centers of various seed companies. Only 26% of input dealers procure from wholesalers. For fertilizers, almost the same number is procured directly from warehouses as from authorized distributors of fertilizer companies. Inputs were either delivered by suppliers or picked-up by buyers with delivery dependent on the volume and intensity of sales by the input dealers.

In the case of input dealer/traders, inputs were loaded on their trucks when going back to their places after delivering agricultural commodities to Cagayan de Oro. Terms of payment were based on the credibility and relationship between supplier and buyer. Buyers with good standing were given inputs on a consignment or credit basis, whereas small dealers (retailers) were provided on a cash basis.

Regarding sales to farmers, the "suki" system was widely practiced. Terms were either in cash or credit on a "charged-to-crop" basis. Credit is usually for more than a three-month period. Input dealers offered discounts of P 2.00 per bag for fertilizer in order to maintain consistent customers. In addition, they shared technical know-how with farmers regarding the use of inputs and offered free delivery to nearby areas. During holidays, they provided "give-aways" as a promotion strategy of their business.

I. Institutions which directly affect Input Suppliers

The Fertilizer and Pesticide Authority, Management Association of the Philippines, and the Ukidnon Sugar Corporation have been among the various institutions that influenced the effectiveness and progressiveness of the input dealers.

Table 2 Input Dealers' Selling Prices of Hybrid Corn Seeds by Brand and Locations, August-September, 1989

LOCATION	B R A N D		
	SMC	PIONEER	CARGILL
	(P/bag)		
CAGAYAN DE ORO			
Lapasan	620-650	830-850	740-780
Cogon	650-680	810	700-720
Carmen	645-650	840	-
CLAVERIA	650	850	-
BUKIDNON			
Malaybalay	630-650	830-850	750-780
Valencia	640-650	840	747-800
Maramag	620-650	850-870	755
Don Carlos	650-660	835-855	750
Kalilangan	640-680	830-880	820

Note: Bags of seed weighed 18-20 kgs.

Source: Interviews with input dealers in Cagayan de Oro, Claveria and Bukidnon.

Table 3 Fertilizer Selling Prices of Cagayan de Oro Input Dealers According To Company and Grade, September, 1989

G R A D E S	B R A N D		
	ATLAS	PHILPHOS	PLANTERS
	(P/bag)		
14-14-14	245	236	238
16-20-0	240	233-236	230
21-0-0	145	-	-
46-0-0	155	-	-
18-46-0	-	345	-
0-0-60	-	175	170
0-18-0	-	-	-
12-12-12	-	-	-

Note: Bags of fertilizer weighed about 50 kg.

Source: Interviews with input wholesalers and retailers in Cagayan de Oro.

Table 4 Fertilizer Prices by Brand, Grade and Location,
August-September, 1989 (Pesos/Bag)

BRAND/GRADE	CAGAYAN DE ORO			CLAVERIA n=1	MALAYBALAY n=4	VALENCIA n=3	MARAMAG n=1	DON CARLOS n=2	KALILANGAN n=2
	Lapasan n=6	Cogon n=2	Carmen n=1						
ATLAS					(P/kg)				
14-14-14	245	234	210	255	248-250	216	250-255	-	-
16-20-0	210	-	238	250	245-250	-	240-250	-	-
21-0-0	145	-	-	140	140	180	-	-	-
46-0-0	185	-	185	-	-	-	180-185	-	-
0-0-60	-	-	-	180	-	-	-	-	-
18-46-0	-	-	-	360	-	-	-	-	-
0-18-0	125	-	-	140	-	-	-	-	-
12-12-12	215	-	-	225	-	-	-	-	-
PHILPHOS									
14-14-14	-	232	235	250	245	-	-	230-250	-
16-20-0	-	-	235	250	245	-	-	232-247	250
0-0-60	-	-	-	180	-	-	-	180-190	-
18-46-0	-	-	-	360	-	345	-	-	-
PLANTERS									
14-14-14	-	-	-	245	-	243	-	-	-
16-20-0	-	-	-	245	-	240	-	-	-
21-0-0	-	-	-	-	-	145	-	-	-
46-0-0	-	-	180-185	190-195	-	195-200	-	-	150-155
0-0-60	-	-	-	180	-	180	-	-	182-220
18-46-0	-	-	-	360	-	-	-	-	-

Note: Bags of fertilizer weighed 50 kgs.

Source: Interviews with input dealers; Cagayan de Oro, Claveria and Bukidnon.

Table 5 Costs of Transporting Inputs from Suppliers to Buyer's Location, August-September, 1989

LOCATION	RANGE OF TRANSPORT COSTS (P/Bag)
CDO - CLAVERIA	8.00
CDO - MALAYBALAY	5.00 - 6.00
CDO - VALENCIA	5.00 - 8.00
CDO - MARAMAG	7.00 - 8.00
CDO - DON CARLOS	5.00 - 8.00
CDO - QUEZON	8.00 - 10.00
CDO - KALILANGAN	20.00 - 25.00
CDO - WAO	20.00 - 25.00

Source: Interviews with input dealers.

Fertilizer and Pesticide Authority (FPA) is an agency attached to the Department of Agriculture for the purpose of assuring the agriculture sector of adequate supplies of fertilizer and pesticides at reasonable prices, rationalizing the manufacture and marketing of fertilizers and protecting the public from the risks inherent in the use of these inputs.

The Management Association of the Philippines (MAP), in cooperation with the Department of Agriculture, has launched a five-year project dubbed as the "one peso per kilo" corn program which will lower the cost of corn production in the country (Bulletin Today, Sept. 5, 1989).

The Bukidnon Sugar Corporation's (BUSCO) demand for sugarcane affects the supply of fertilizers because the fertilizer requirements for sugarcane are about 18 bags/hectare.

VII. Problems

There is considerable variation in the problems encountered by type of input dealer, years in business and location. However, the most common problems were: lack of capital, limited volume of sales, periodic shortages of fertilizer in particular, and bad debts. Input dealers in locations with poor road conditions also encountered serious transportation problems (Table 6).

A persuasive problem was the difficulty in competing with unlicensed trader/input dealers especially those who financed farmers with inputs. Likewise, larger farmers could by-pass local input dealers by backhauling seeds and fertilizer from CDO after hiring a truck to deliver their corn there. Consequently, input dealers in the production areas needed various strategies, such as financing farmers, discounts, maintain a few "suki" relationships, share technical know-how, provide free delivery, or give-away calendars or T-shirts in December, to survive in this type of business.

Table 6 Problems of Inputs Dealers

PROBLEMS	UNDER WHAT CONDITIONS	CAUSES	EFFECTS
* LACK OF CAPITAL	For expansion which is mostly needed in procuring and selling more volume of inputs (Dominant for W/R).	No collateral for bank loans.	Customers are limited particularly to small farmers. Cannot expand business.
* LOW SALES VOLUME	Few farmers are buying inputs (Dominant for Retailer). Entry of more dealers in the market. Improper storage.	Keen competition with the unlicensed traders who directly financed inputs to farmers.	Reduced profit.
* SUPPLY SHORTAGE OF INPUTS, PARTICULARLY INORGANIC FERTILIZER	During planting season (April-March 1st cropping July-August 2nd cropping) (Dominant in Malaybalay Retailers and Lapasan W/R).	Unavailability of container space (bottoms) to transport fertilizers from Cebu to Leyte. Delayed processing of fertilizer due to delayed arrival of imported raw materials. Competition with high-valued crops, i.e., sugarcane uses more fertilizer.	High input costs. Unavailability of the kind of inputs needed.
* BAD DEBTS	Usually practiced by small farmers who availed of credit on a charge to crop failure in previous years (both seasons). Had the lowest recovery rate of 50% (Dominant in Don Carlos and Maramag Retailers also in W/R)	Delayed payment of buyers granted with inputs on credit.	Adversely affects cash flow of dealers.
* TRANSPORTATION	During rainy season where road was hardly passable (Dominant in Claveria and Kalilangan retailers who purchase inputs in CDO).	Poor road/bridges due to poor maintenance. Lack of transport facilities. Limited truckers.	High cost of transportation. High cost of inputs. Delayed delivery of inputs.

**IMPLICATIONS FOR CDO TRADER/SHIPPERS OF THE
INCREASE IN CORN SUPPORT PRICE AND OF CORN
IMPORTATION**

I. Background

The Rapid Marketing Appraisal (RMA) for Corn in Northern Mindanao which was conducted during the peak harvest of the first cropping season of 1989 generated primary data on the perceptions of many large traders in Cagayan de Oro on certain government policies affecting the corn industry. Particularly, this concerns the increase in the support price for corn from P 2.90 to P 3.90 and on allowing corn importation for the Manila feedmillers and large poultry and livestock raisers. One should note that the study is seriously limited in the analysis of the above mentioned government policies because of the following: First, the RMA methodology's scope and time period does not allow for a more in-depth investigation of the issues concerned; Second, the research setting focused more on the Northern Mindanao region and interviews in Manila were not exhaustive; Third, the NFA role was not actually studied on field as it did not actively participate in corn buying during that particular season due to the unusually high level of farmgate prices prevailing that time. Hence, this paper merely attempts to capture certain scenarios as pointed out by the traders in Cagayan de Oro.

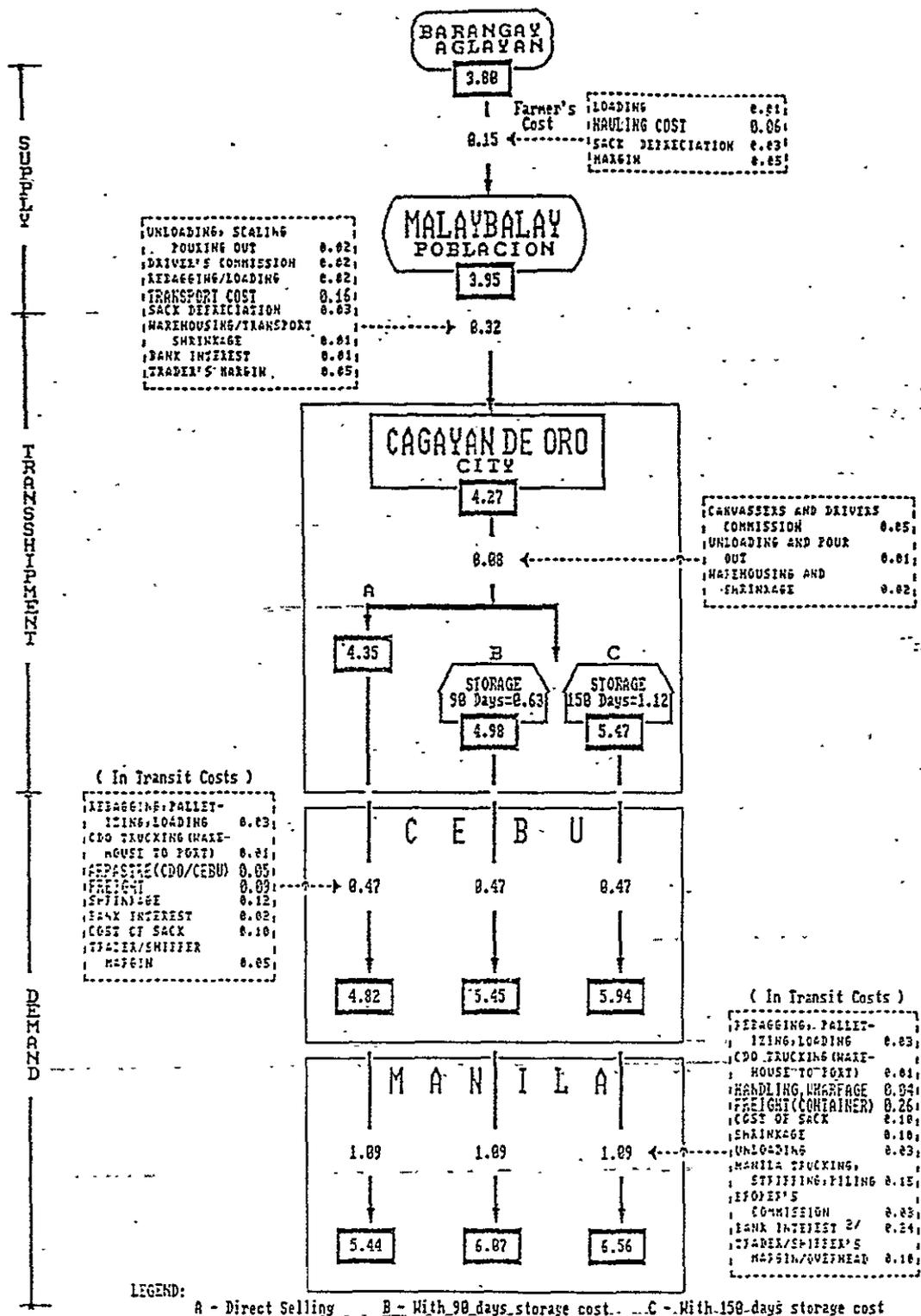
Basically, the hypothesis in this paper dwells on the dual scenarios of corn importation, i.e., during the peak or lean months. Secondly, these corn importations are examined with respect to the price of corn landed in Manila coming from Cagayan de Oro and the price of the imported corn. Reference is also made on the untimely arrival of corn imports as reported by the Cagayan de Oro trader/shippers and likewise by Cebu large traders. Finally, computation on the marketing costs for moving corn from Bukidnon, Region X to Manila were based on trader interviews.

II. Costs of Moving Corn from Bukidnon to Manila

The total marketing costs of moving corn from a sample barangay in Bukidnon to Manila is shown in Figures 1 and 2. The sample barangays, Aglayan and Milaya are located 12 kilometers and 132 kilometers, respectively from the main trading center of Malaybalay, Bukidnon. Variations in marketing costs between the two barangays can be seen in the cost of hauling and loading to Malaybalay and transport cost and drivers' commissions to Cagayan de Oro (Table 1). The figures show that the total marketing costs for corn transported from barangays Aglayan and Milaya to a Manila feedmiller's warehouse is P 2.11 if sold directly, P 2.74 if sold after 3 months storage and P 3.23 if sold after 5 months storage. Hence, given a farmgate price of P 3.80 in Barangay Aglayan, and P 3.15 in Barangay Milaya, the cost of corn landed in Manila would correspond to P 5.44, P 6.07 and P 6.56, respectively.

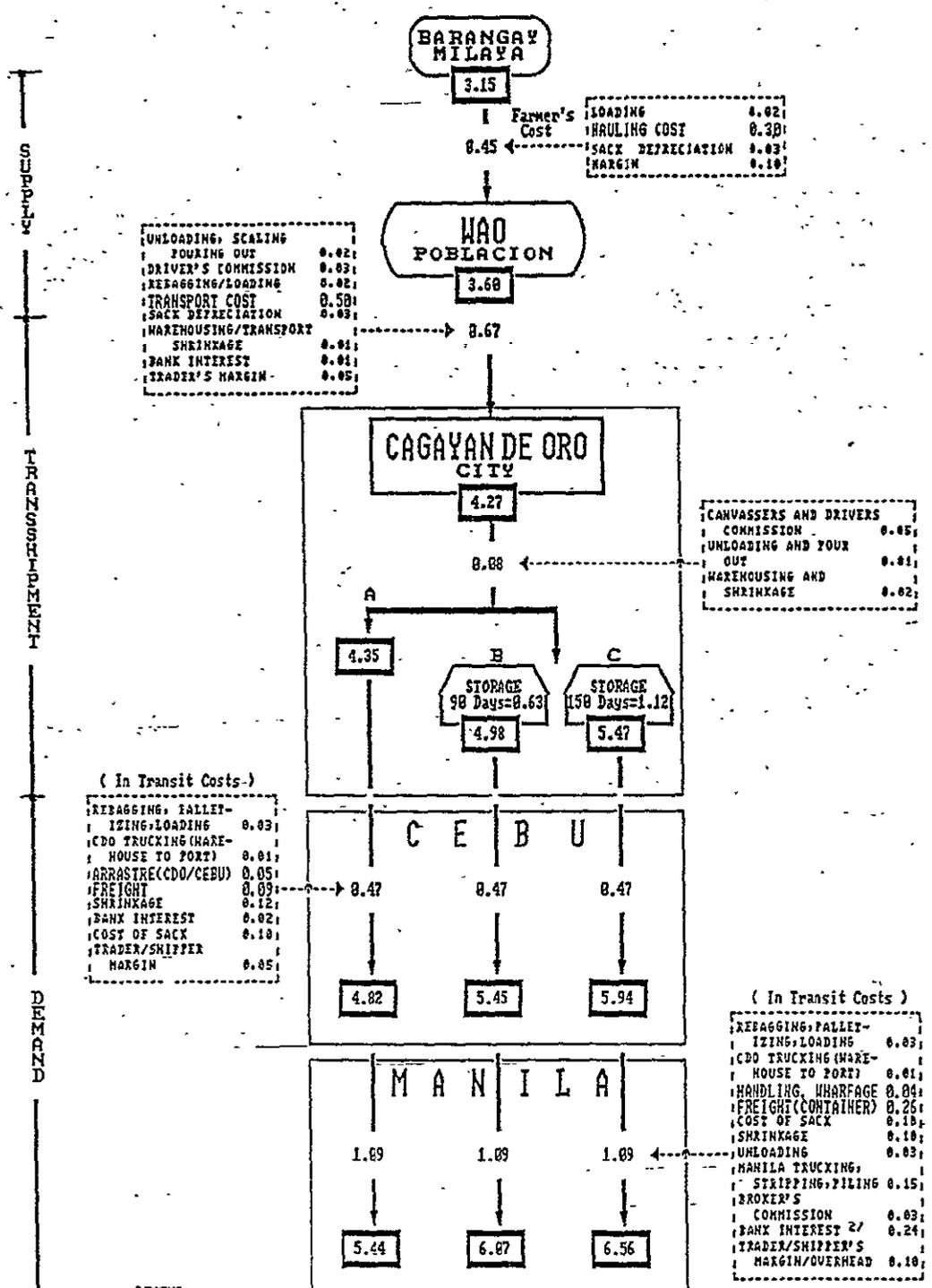
^{1/} Bukidnon Province contributes about 67 percent to Northern Mindanao's total corn output.

Figure 1 Marketing Costs in Moving Corn from Aglayan, Malaybalay (Supply Area) to Cebu and Manila based on Actual Buying Price for Corn



1/ Marketing costs to Cebu cover up to Cebu port only as the Cebu buyer normally picks up the corn in the port. On the other hand, marketing costs to Manila include trucking from Manila port to feedmiller's warehouse as this is the usual practice.
 2/ High interest cost due approximately to 60 days delayed payments to trader/shipper and delayed shipments caused by limited vessels available. The 60 days represent turn-over period for the trader/shipper.

Figure 2 Marketing Costs In Moving Corn from Milaya, Wao, Lanao del Sur (Supply Area) to Cebu and Manila based on Actual Buying Price for Corn ^{1/}



LEGEND: A - Direct Selling B - With 98 days storage cost... C - With 150 days storage cost

1/ Marketing costs to Cebu cover up to Cebu port only as the Cebu buyer normally picks up the corn in the port. On the other hand, marketing costs to Manila include trucking from Manila port to feedmiller's warehouse as this is the usual practice.
2/ High interest cost due approximately to 60 days delayed payments to trader/shipper and delayed shipments caused by limited vessels available. The 60 days represent turn-over period for the trader/shipper.

Table 1 A Scenario of Detailed Marketing Costs Based on A ctual Buying Price of Corn in Barangays of Two Supply Areas to Cebu and Manila

COST ITEMS	LOCATION					
	Aglayan, Malaybalay I			Milaya, Wao S		
	A	B	C	A	B	C
FROM SOURCE TO CAGAYAN DE ORO						
Barangay	3.80			3.18		
Buying Price						
A Hauling						
1. Hauling	0.01			0.02		
2. Hauling rept	0.06			0.20		
B Sacks Depreciation						
1. Sacks	0.03			0.03		
C. Margin						
1. Margin	0.06			0.10		
Subtotal	0.15			0.45		
Cost of Corn Grain in the Production	3.95			3.60		
Municipal/Provincial Traders						
A. Buying Costs						
1. Unloading, sealing & pouring out	0.02			0.02		
2. Driver's commissions	0.02			0.03		
B Selling Costs						
1. Rebagging	0.01			0.01		
2. Loading	0.01			0.01		
3. Trucking out	0.16			0.30		
4. Sack depreciation 3/	0.03			0.03		
5. Warehousing & transport shrinkage	0.01			0.01		
6. Bank interest (7 days turn around)	0.01			0.01		
7. Trader's Margin/overhead	0.06			0.06		
Subtotal	0.22			0.47		
Total Cost of Corn Grains in CDO	4.27			4.27		
II CAGAYAN DE ORO TO CEBU						
Trader-Shippers						
A. Buying Costs						
1. Casavassers & drivers commission	0.05			0.05		
2. Unloading & pouring out	0.01			0.01		
3. Warehousing (holding) & shrinkage cost	0.02			0.02		
Subtotal	0.08			0.08		
B Storage Cost (90 days)	0.63			0.63		
(150 days)	1.12			1.12		
CDO Prevailing Price (Selling)	4.25	4.98	5.47	4.25	4.98	5.47
C. Selling Costs						
1. Rebagging, palletizing & loading	0.03	0.03	0.03	0.03	0.03	0.03
2. CDO Trucking (warehouse to port)	0.01	0.01	0.01	0.01	0.01	0.01
3. Arrastre (combined CDO & Cebu)	0.05	0.05	0.05	0.05	0.05	0.05
4. Freight (palletized/container)	0.09	0.09	0.09	0.09	0.09	0.09
5. Shrinkage	0.12	0.12	0.12	0.12	0.12	0.12
6. Bank interest (7 days turn around)	0.02	0.02	0.02	0.02	0.02	0.02
7. Cost of Sack 4/	0.10	0.10	0.10	0.10	0.10	0.10
8. Trader-Shipper's Margin	0.05	0.05	0.05	0.05	0.05	0.05
Subtotal	0.47	0.47	0.47	0.47	0.47	0.47
Landed Cost of Corn Grains in Cebu 5/	4.82	5.45	5.94	4.82	5.45	5.94
III CAGAYAN DE ORO TO MANILA						
A. Buying Costs						
1. Casavassers & drivers commissions	0.05			0.05		
2. Unloading & pouring out	0.01			0.01		
3. Warehousing & shrinkage costs	0.02			0.02		
Subtotal	0.08			0.08		
B Storage Cost (90 days)	0.63			0.63		
(150 days)	1.12			1.12		
CDO Prevailing Price (Selling)	4.35	4.98	5.47	4.35	4.98	5.47
B. Selling Cost						
1. Rebagging, palletizing & loading	0.03	0.03	0.03	0.03	0.03	0.03
2. CDO trucking (warehouse to port)	0.01	0.01	0.01	0.01	0.01	0.01
3. Freight with container	0.26	0.26	0.26	0.26	0.26	0.26
4. Handling and wharfage	0.04	0.04	0.04	0.04	0.04	0.04
5. Cost of Sack 4/	0.10	0.10	0.10	0.10	0.10	0.10
6. Shrinkage	0.10	0.10	0.10	0.10	0.10	0.10
7. Unloading	0.03	0.03	0.03	0.03	0.03	0.03
8. Manila trucking, stripping, & piling	0.15	0.15	0.15	0.15	0.15	0.15
9. Broker's commission	0.03	0.03	0.03	0.03	0.03	0.03
10. Bank interest (60 days turn around)	0.24	0.24	0.24	0.24	0.24	0.24
11. Trader-Shipper's margin/overhead	0.10	0.10	0.10	0.10	0.10	0.10
Subtotal	1.09	1.09	1.09	1.09	1.09	1.09
Landed Cost of Corn Grains in Manila 6/	5.44	6.07	6.56	5.44	6.07	6.56

1/ Distance of Aglayan, Malaybalay (Buhadon) to Cagayan de Oro City is 105 kms
 2/ Distance of Milaya, Wao (Lanao del Sur) to Cagayan de Oro City is 225 kms
 3/ Cost of sack is divided by their three uses.
 4/ Included during selling.
 5/ Sum of Items I and II
 6/ Sum of items I and III

Legend. A - Direct Selling B - With 90 days storage cost C - With 150 days storage cost

Source: NFA, Municipal/Provincial traders and Trader-Shipper's interviews

III. Findings and Implications

With the increase in the support price for corn to P 3.90 per kilo at the farmgate, and inferring from Table 1 on the marketing costs for moving the corn from a particular supply point in Bukidnon, one would deduce that the total price of corn from a Northern Mindanao farm shipped to Manila would be P 5.54 if sold directly, and would be around P 6.17 to P 6.66 if sold after 3 to 5 months of storage. Whereas, the landed cost of imported corn in Manila is about P 4.50.² Amid this backdrop, the Cagayan de Oro traders claimed that they could not compete with the cheap imported corn landed in Manila.

The implications of the above scenario are as follows:

1) During the peak harvest season, a Cagayan de Oro trader planning to ship-out his corn directly to Manila at a price of P 5.54 per kilo would lose his opportunity to sell if the corn imports which cost P 4.50 would arrive during that period. This situation has been actually experienced several times by the CDO traders.

On the other hand, if imported corn would arrive during the lean months, the traders claimed that they would not have adequate incentives to invest in large storage and drying facilities which are necessary to spur corn production.

2) There is a need for a continuous re-assessment and policy dialogues among the government and private sector in threshing out issues and in coming up with concrete and innovative recommendations.

3) Further in-depth research can be conducted on Thailand's reported comparative advantage in producing corn relative to the Philippines.

² Based on the cost of imported corn from Thailand, CIF Manila plus 20% import tax.

SHIPPING SECTOR REPORT

I. Introduction

Inter-island shipping plays an important role for traders in the country's archipelagic setting by linking the supply and the demand areas. Cagayan de Oro City is the trading center, transshipment port and outlet of agricultural products from Region X. This city is strategically located on the northern coast of Mindanao with easy access to the demand centers of Cebu (trading capital of the Visayas) and Manila.

The bulk of agricultural and industrial commodities coming from the island of Mindanao are shipped by sea, especially for large volume of shipments. Land and air transportation are also utilized but for less bulky and higher valued commodities.

II. Port Facilities and ServicesA. Port Facilities

1. Supply Area - Cagayan de Oro Port

Within Cagayan de Oro City, there were three ports that existed: One national port and two private ports. However, all corn being shipped out of CDO passes through the national port, hence, discussion will be focused on it.

The Cagayan de Oro Port is considered the best port in Mindanao since its expansion in 1986. It has a total area of 11.56 hectares and a quay length of 892 linear meters where eleven vessels can be accommodated at a time. Other facilities are the open storage area, container marshaling yard and container freight station. It is also equipped with a stand-by power generator and provides cargo handling, pilotage, tug assistance, water supply, chandling, fuel, light and power supply.

2. Demand Area - Cebu City Port

Cebu City has a 1,748 linear meter quay length port, with three piers and 10 berths for domestic ships and the Cebu International Port for foreign vessels. The port has passenger terminals, private warehouses, open storage areas, a weigh bridge and a stand-by power generator. It covers an area of 42.3 hectares.

B. Cargo Handling Services

1. Supply Area - Cagayan de Oro Port

Cargo handling services at the Cagayan-de Oro port are provided by two arrastre and stevedoring companies. Unfortunately only one has enough heavy equipment and manpower to efficiently move cargoes within the port. The other one is deficient in heavy equipment, hence, less preferred by shippers.

2. Demand Area - Cebu City Port

The Cebu domestic and international ports are serviced by six arrastre and stevedoring companies which have adequate manpower and equipment to serve the cargo handling needs of the shippers.

Figure 1 presents the volume of domestic cargoes handled by CDO and Cebu arrastre and stevedoring companies during the 1984-88 period. It can be noted that cargoes handled in the two ports were mostly loaded in non-containerized vessels (either in bulk, break-bulk or palletized). This implies that the shipping industry still relies on manual plus heavy cargo handling equipment as a basic type in handling operation.

C. Shipping Lines

There are seven shipping companies as members of the Confederation of Inter-island Shipowners and Operators (CISO) in Cagayan de Oro. Four vessels from three shipping companies service the Cagayan de Oro-Cebu route (two vessels daily) which allocates 6,000-10,000 bags of cargo for corn. Three of these vessels are the roll-on, roll-off (RORO) type which represent a new trend in inter-island shipping vessel. These vessels permit the horizontal mode of transferring cargo from pier to vessel or vice versa through the use of the ship's or shore-based ramps, requiring minimal cargo handling equipment.

Five container vessels from four shipping companies call on the Cagayan de Oro Port. Vessels from two companies ply the Cagayan de Oro-Manila route and the others call on ports of Bugo (where a major cannery is situated), Iligan and Ozamis before going to Manila. The lines maintain the routes using different container vessels of different cargo capacities. Thirty percent of the vans are supposed to be allocated for corn. Tramping vessels which are either trip, time or bareboat chartered are self-sustaining (with booms or cranes used for loading and unloading cargoes) vessels or barges. These were mainly used in non-scheduled operations for special commodities, particularly breakbulk cargoes. Table 1 shows the major shipping companies in CDO plying the CDO-Cebu and CDO-Manila routes.

Figure 1
Domestic Cargo - CDO & Cebu Ports
Containerized & Non-Containerized

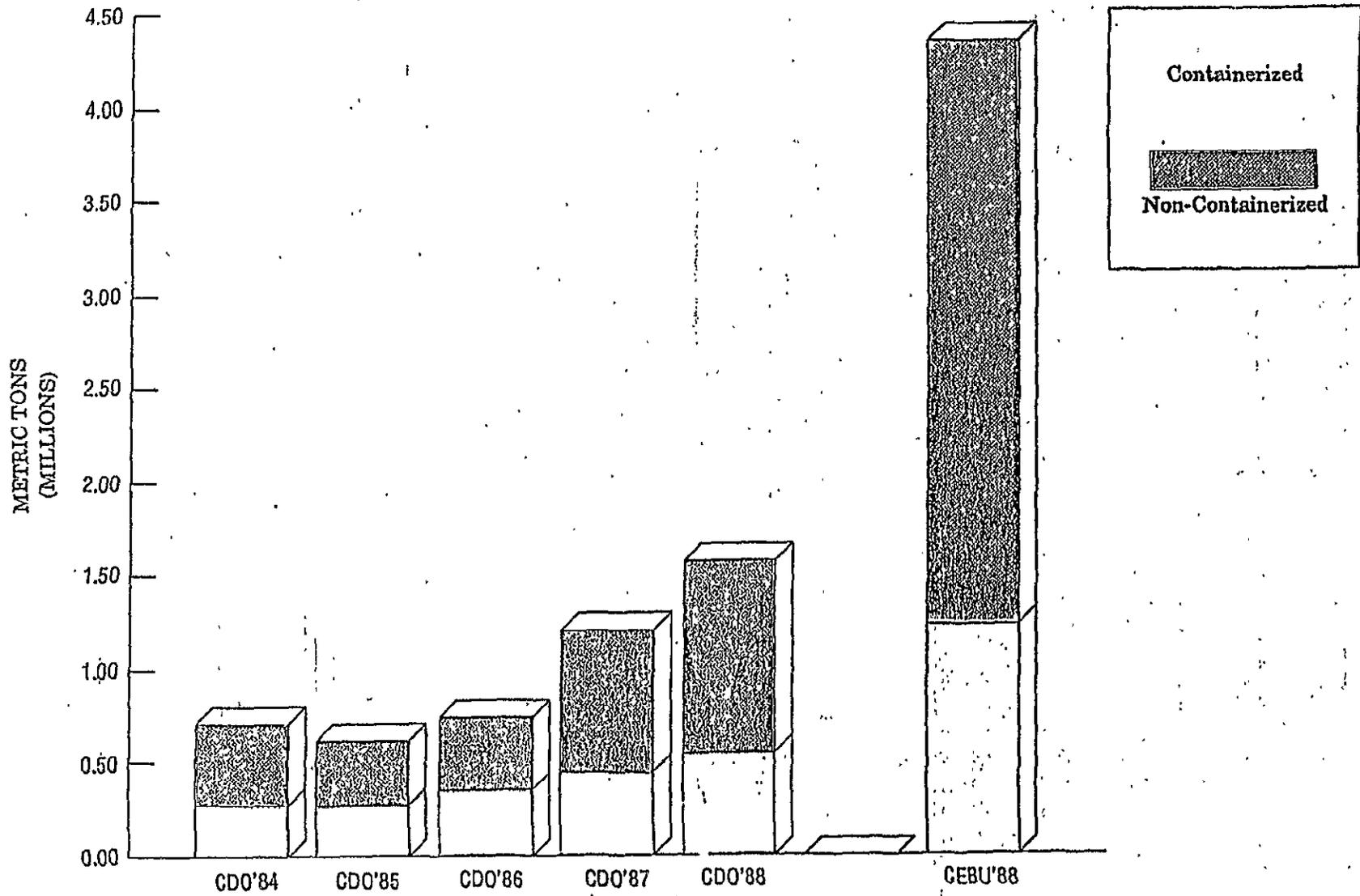


Table 1 Shipping Lines/Companies Servicing Cagayan de Oro by Type and Number of Vessels (Plying CDO-Cebu and CDO-Manila Routes), 1989

Name of Shipping Line/Company	Container Vessels	Passenger-Cargo Vessels	Total
William Lines	1	1	2
Gothong Lines		1	1
Trans-Asia		2	2
Sulpicio Lines	1	2	3
Aboitiz Shipping	1		1
Lorenzo Shipping	1		1
Negros Navigation		1	1
TOTAL	4	7	11

Source: Interviews with Shipping Lines Operator/Representatives

D. Shippers

There are several types of businessmen-shippers using the vessels servicing Cagayan de Oro. However, the discussion will center on shippers involved in shipping corn and hogs.

Interviews revealed that there were around 30 corn shippers classified as trader/shippers and processor/trader/shippers within Cagayan de Oro that utilized different types of vessels in moving their corn out of the CDO port. In fact, during the peak harvest months of the first cropping season, shippers competed among themselves for allocated bottom space. A few shippers with bigger volumes of corn had chartered tramps in order not to delay their scheduled deliveries.

Likewise, there were five commercial hog raisers within Region X that regularly sent hogs to Manila and Cebu via CDO port. Two of these hog shippers send around 550 heads per week to Manila while the remaining three ships at least 90 heads per week to Cebu.

E. Economics

1. Shipping Cost

Corn shippers from Cagayan de Oro paid as much as P 0.13 for every kilogram of corn being delivered to Cebu (port-to-port) while shipping lines spent P 0.016 per kilogram for the stevedoring services for a total of P 0.15 per kilogram if they used breakbulk vessels. It is however, cheaper by P 0.01 per kilogram if a corn shipper will load his corn in pallets as a result of a 15% discount of stevedoring and arrastre fees given to shippers of palletized cargo, based on the PPA regulated handling cost of loose cargo. Cargo on pallets is easier to handle and takes less time to load and unload than the breakbulk cargoes (Table 2).

Table 2. Cost of Shipping Corn from Cagayan de Oro to Cebu
(Port to port @ P/kg), by type of cargo, 1989.

ITEM	BREAKBULK	PALLETIZED
SHIPPER'S COST		
Freight	0.086	0.086
Wharfage	0.003	0.003
Arrastre	0.044	0.037
Sub-total	0.133	0.126
SHIPPING LINE'S COST		
Stevedoring	0.016	0.014
TOTAL	0.15	0.14

On the other hand, the hog shipper from CDO will spend P 122.00 per head for freight and handling (arrastre and stevedoring) for shipping hogs to Manila using a hog van. However, the expenses will run up to P 170.00 per head if all other expenses are computed, i.e., convoy's fee, feeds, among others. The shipping cost to Cebu is only P 48.00 per head (for freight and handling).

F. Institutions and Power

1. Philippine Ports Authority (PPA)

The Philippine Ports Authority was created by Presidential Decree No. 505, as amended by Presidential Decree No. 857 primarily for the purpose of implementing an integration of Ports or Port Districts for the entire country in accordance with the following objectives:

1. To coordinate, streamline, improve and optimize the planning, development, financing, construction, maintenance and operation of ports, port facilities, port physical plants, and all equipment used in connection with the operation of a port;
2. To ensure the smooth flow of waterborne commerce passing through the country's port whether public or private, in the conduct of international and domestic trade;

To promote regional development through the dispersal of industries and commercial activities throughout the different regions;

To foster inter-island seaborne commerce and foreign trade;

To redirect and reorganize port administration beyond its specific and traditional functions of harbor development and cargo handling operations to the broader function of total port district development, including encouraging the full and efficient utilization of the port's hinterland and tributary areas; and

To insure that all income and revenues accruing out of dues, rates and charges for the use of facilities and services provided by the authority are properly collected and accounted for by the authority, that all such income and revenues will be adequate to defray the cost of providing the facilities and a service (inclusive of operating and maintenance cost, administration and overhead) of the Port Districts, and to ensure that a reasonable return on the assets employed shall be realized.

2. Maritime Industry Authority (MARINA)

This government agency was created in June 1, 1974 thru Presidential Decree 474 with the following objectives:

To increase the production and productivity of various islands and regions of the archipelago through the provision of effective linkages;

To provide for the economical, safe, adequate and efficient shipment of raw materials, products, commodities and people;

To enhance the competitive position of the Philippine flag vessels in the carriage of foreign trade;

To strengthen the balance of payment position by minimizing the outflow of foreign exchange and increasing dollar earnings; and

To generate new and more job opportunities.

Functions and Responsibilities:

Adoption and implementation of a practicable and coordinated Maritime Industry Development Program that shall include the following: early replacement of obsolescent and uneconomic vessels; modernization and expansion of the Philippine merchant fleet; enhancement of the domestic capability for shipbuilding, repair and maintenance; and the development of a reservoir of trained maritime manpower.

2. Assistance in the provision of the following: financial assistance to the industry through public and private financing institutions and instrumentalities; technical assistance; a favorable climate for the expansion of domestic and foreign investments in shipping enterprises; and effective supervision and rationalization, management, ownership and operations of all water transport utilities and maritime enterprises.

G. Problems

1. Shipping Lines

High taxes and custom duties imposed on imported vessels and spare parts, lack of government incentives in the form of subsidies and credit assistance with low interest rates were the pressing problems mentioned. These have reportedly deterred the shipping companies from improving and properly maintaining their domestic fleet.

The low freight rate of corn makes it a low priority cargo, thus shipping lines allocate only limited space for it. However, during the peak harvest in the first cropping season (August and September, 1989), as much as 58% of the total cargo outbound was corn (Table 3). The demand for bottom space at this time increased while the number of the vessels was more or less maintained.

Other problems mentioned include spillage due to the use of poor quality sacks and rough handling practices and spoilage of corn because of the high moisture content when placed in vans. The shipping line should pay for the damages during the course of shipment.

Delayed unloading and accommodation of cargo by shippers, lack of cargo handling facilities and port congestion resulted to delay in the voyage of container vessels. The lack of more container vans was due to its high acquisition cost. Table 4 shows the problems mentioned by the shipping companies.

2. Shippers

Shippers mentioned the problem of limited allocation of bottom space for corn due to the low freight rates which make corn a low priority cargo. Some of the shippers charter tramping vessels which cost more to hire than scheduled container vessels.

Pilferage in Cebu City port caused losses for the Cagayan, de Oro and other Mindanao corn shippers. This problem may be caused by the unregulated entry and exit of people within the port compound.

The lack of hauling trucks in CDO to transport corn from the warehouse to the port delays the vessel's departure or sometimes decreases the volume of corn shipped out. Table 5 shows the problems mentioned by shippers.

Table 3 Port Traffic and Cargo Statistics, CDO Base Port

1989	Shipcalls Domestic	Corn Shipped Out	G R T	Conventional Outbound	Containerized Outbound	Total Outbound	Percentage of Corn Shipped Out
(MT)							
Jan	171	30521	200321.74	36886	18464	55350	55.14%
Feb	159	22935	187292.28	27146	19273	46419	49.41%
Mar	168	31515	207296.92	34673	25188	59861	52.65%
Apr	171	21201	225182.09	24936	23668	48604	43.62%
May	173	12918	221773.16	20117	22042	42159	30.64%
Jun	168	11998	228853.13	22380	27540	49920	24.03%
Jul	180	22196	237976.76	30766	25027	55793	39.78%
Aug	182	39576	237880.05	48778	24840	73618	53.76%
Sep	160	42560	222118.45	47471	26416	73887	57.60%
Oct	159	24553	215174.25	32522	28989	61511	39.92%
Nov	136	12405	181818.51	22940	26536	49476	25.07%
Dec	170	23590	226278.92	31224	24368	55592	42.43%

Source: PPA, Cagayan de Oro

Table 4 Problems Mentioned by the Shipping Companies

PROBLEMS	UNDER WHAT CONDITION	CAUSES	EFFECTS
High taxes and custom duties in buying new ships and spareparts for improvement and maintenance of vessels	Acquisition of vessels and spareparts	Government policy	Absence of tax concessions, restrictions on importation of ships & spareparts deter shipping companies to acquire new vessels and properly maintain their fleet
Lack of government incentives in form of subsidies and credit assistance with low interest rates to improve the procurement of facilities/vessels			
Limited allocation of bottom space for corn	Shipment of corn	Low freight rate	Lesser volume of corn shipped out
Shipping of high moisture content corn in vans		High demand	Spoilage - the shipping company pays for the damages
Spillage		o poor quality sacks are used o poor cargo handling practices	The shipping company pays for the damages
Lack of container vans	Shipment	o costly investment	Lesser volume of corn shipped out
Delay of schedule of container vessels		o delays of withdrawal and accommodation by shippers	Delay of sailing time of container vessel

Table 5 Problems Mentioned by Shippers

PROBLEMS	UNDER WHAT CONDITION	CAUSES	EFFECTS
Limited allocation of bottom space or shutouts	Shipment of corn	Low freight rate	Lesser volume of corn shipped out
Pilferage in Cebu City Port		Unregulated entry & exit points	Losses
Lack of container vans	Shipment	Costly investment	Lesser volume of shipped out
Lack of trucks to transport corn from warehouse to port		Delays of accommodation by shippers	Delays in vessels departure Lesser volume of corn shipped out

3. Cargo Handling Contractors (Arrastre and Stevedoring)

The lack of proper cargo handling equipment affected the efficiency of the services rendered because adequate heavy cargo handling equipment is not available. Some contractors resorted to using heavy construction equipment that is not suited for cargo handling. Vans and cargo are prone to be damaged when this kind of equipment is used.

Since the vans are sealed for shipment, the cargo handling contractors have no idea of their contents. They only get to know that the van is overloaded when their fork-lifts tip when trying to lift them. Such overloading often damaged the cargo handling equipment.

When handling rates are on a per sack basis there is overloading of sacks to as much as 80 kgs/sack to reduce the rates were 50 kgs maintained in each sack. Although this slowed down the manual cargo handling process, they were tolerated. Table 6 shows the problems mentioned by cargo handling contractors.

4. Hog Raisers

Insufficiency of hog vans was mentioned by hog shippers as one of their priority problems. The few hog vans in CDO required that the same vans used to ship hogs to Cebu or Manila be shipped back to CDO empty to be used for the next shipment at the expense of the shipping lines. Empty vans that did not generate income were given the lowest priority during loading. Sometimes these vans had to wait for a later trip before being transported back. Table 7 shows the problems mentioned by hog raisers.

Table 6 Problems Mentioned by Cargo Handling Contractors

PROBLEMS	UNDER WHAT CONDITION	CAUSES	EFFECTS
Lack of cargo handling equipment	Cargo handling movement	High acquisition cost	Damages, inefficient cargo handling, delays
Overloading of container vans and sacks		Shippers minimize shipping cost due to fixed freight rate	Damage of cargo handling equipment Slows down cargo handling process

Table 7 Problems Mentioned by Hog Raisers

PROBLEMS	UNDER WHAT CONDITION	CAUSES	EFFECTS
Limited allocated space for hogs and other livestock	Shipment of livestock	Low freight rates	Lesser number of livestock being shipped out
Lack of hog vans		Costly Investment	Competes with loaded vans on return trip of the vessel

T E R M S

REVENUE TON	1000 kilograms or the American measurement of 40 cubic feet or 1.1326 cubic meter whichever is higher as it appears in the manifest or hatch list.
PALLETIZED/ UNITIZED CARGOES	refers to a single unit/package of not less than one (1) metric ton or 1.1326 cubic meter with its own fittings/attachment to facilitate loading/unloading.
BULK CARGOES	refers to products in a mass of one commodity not packaged, bundled, bottled or otherwise packed.
GENERAL OR BREAKBULK CARGO	are cargoes in bags, sacks, crates, boxes, cases, drums and other loose cargo.
CONTAINERIZED/ CONTAINER CARGO	are cargoes stuffed, inside a container van which are specifically designed to facilitate roady handling particularly its transfer to another without intermediate reloading.
ROLL-ON ROLL-OFF VESSELS	the PPA defines RO-RO vessels as ships which have capacity to permit the horizontal mode of transferring cargoes from pier to vessel or vice versa through the use of ship or shore-based ramps.
STEVEDORING SERVICES	are work performed on board vessel, that is in the process or act of loading and unloading cargo, stowing inside hatches, compartments and on deck or open cargo spaces on board vessel. Related services to stevedoring are the activities of rigging ship's gear, opening and closing hatches securing cargo stored on board by lashing, shoring and trimming.
STEVEDORING SERVICES FOR RO-RO VESSELS	handling of cargoes or containers transported from the dock to hold of a ro-ro ship and vice versa using equipments like forklifts or grablifts.
GROSS REGISTERED TONNAGE	the measure of the internal volume of spaces within a vessel in which 100 cubic feet is 1 ton.

APPENDIX 1

INSTITUTIONAL DIMENSIONS OF THE REGION X RAPID MARKETING APPRAISAL FOR CORN

	Regional Level									National Level			
	Project Management Oro Chamber	Core Group (Advisory Committee)			Research Team				Other Private/Public Sector Support	AAPP	USAID	BAS	D.A.
		Oro Chamber	DMMMPSC	DA	PS	XU	USM	BAS					
1. Technical Assistance (Foreign Consultancy)										X			
2. Training													
a. Trainors					X					X			
b. Participants					X	X	X	X					
c. Other resource persons			X						X				
3. Funding													
a. Source	X									X	X		
b. Disbursement	X												
4. Professional Participation	X	X	X	X	X	X	X	X		X		X	
5. Field Logistical Support													
a. Transportation	X												
b. Accommodations	X		X						X				
6. Operational Support													
a. Clerical	X												
b. Photocopying	X												
c. Ticketing	X												
7. Review of Results	X	X	X	X					X	X	X	X	X
8. Writing Reports					X	X	X			X			
9. Documentation	X				X	X	X		X	X			
10. Design and Coordination	X				X					X	X		

ACRONYMS

Oro Chamber	Cagayan de Oro Chamber of Commerce and Industry Foundation, Inc.
DA	Department of Agriculture
BAS	Bureau of Agricultural Statistics
DMMMPSC	Don Mariano Marcos Memorial Polytechnic State College
XU	Xavier University (Cagayan de Oro)
USM	University of Southern Mindanao (Cotabato)
PS	Private Sector representatives
AAPP	Accelerated Agricultural Production Project
USAID	United States Agency for International Development

APPENDIX 2

SAMPLING FRAME OF MARKETING PARTICIPANTS IN NORTHERN MINDANAO AND CEBU

A. Farmers and Traders

LOCATION Province/Municipality/ Barangay	FARMERS		TRADERS						TOTAL
	White Corn	Yellow Corn	Barangay	Municipal	Provincial/ Regional	Trader/ Shippers	Cebu Buying Stations	Canvassers	
MISAMIS ORIENTAL:									
o Cagayan de Oro City				10	2	7	3(3)	3(25+)	25
Opol									
El Salvador									
o Clavria				4(8)					4
Hinaplunan	5	5	3(7)						17
Anei	5	5	1(1)	1(1)					12
BUKIDNON:									
Baungon									
Manolo Fortich									
o Malaybalay				5(12+)	3(3)				8
Magsaysay	10	3	7(10)*						20
Aglayan	7	7	1	3					18
Nasuli									
Valencia				7(15)	3				10
Maramag					1				1
o Don Carlos				4(8+)	2				6
New Visayas	8	6	2(3)	1					17
Pualas	7	7	5	1					20
Calao-calao - (Near Pualas)				2					2
Pangantucan					2				2
o Kalilangan				6(46+)	1				7
Kibaning	6	4	1(1)						11
Kinura - (Near Kibaning)			1						1
Lampanusan	5	5	2(5)						12
o Wao				7(20+)	2				9
Milaya	5	5	3(4)						13
Katutungan	5	5							10
Sub-total	63	52	26	51	16	7	3	3	221
CEBU:									
o Cebu City						7			7
Mandaue									
Consolacion									
Liloan									
Talisay									
Sub-total	0	0	0	0	0	7	0	0	7
TOTAL	63	52	26	51	16	14	3	3	228

Legend: () - Total Number

* - Buys corn/coffee

B. Processors and End-Users

LOCATION Province/Municipality/ Barangay	PROCESSORS AND END-USERS									TOTAL
	Corn a/ Millers	Hog Raisers	Poultry Raisers Backyar	Large	Hog & Poultry Raisers	Feed Millers	Feed Ingredients Dealers	Starch/ Oil Manufacturers	Noodle	
MISAMIS ORIENTAL:										
o Cagayan de Oro City	4	1 (1)				2 (2)		1		8
Opol	2	1 (1)			1 (2)					4
El Salvador	1	1 (1)		1 (1)						3
o Claveria	2 (3)									2
Hinaplanan	1 (2)									1
Anei	3 (4)									3
BUKIDNON:										
Baungon		1 (1)								1
Manolo Fortich		1 (1)								1
o Malaybalay	9 b (1)	1 (3)		2	1 (1)					13
Magsaysay										
Aglayan										
Nasuli										
Valencia	4 (10)		1	2	1 (2)					8
Maramag										
o Don Carlos	2 (5) (1)		1	2						5
New Visayas										
Pualas	1 (1)									1
Calao-calao - (Near Pualas)										
Pangantucan										
o Kalilangan	1 (4)									1
Kibaning	1 (1)									1
Kinura - (Near Kibaning)										
Lampanusan										
o Wao										
Milaya	1 (2)									1
Katutungan	2 (3)									2
Sub-total	34	6	2	7	3	2	0	1	0	55
CEBU:										
o Cebu City	1				4		2	2		9
Mandaue	4				1	3	1		3	12
Consolacion								1		1
Liloan					5					5
Talisay	2				1					3
Sub-total	7	0	0	0	11	3	3	3	3	30
TOTAL	41	6	2	7	14	5	3	4	3	85

1- Four are custom-commercial located in each of the municipalities of El Salvador, Claveria, Malaybalay, and Valencia.

2- Located in the different barangays of Malaybalay with one respondent for each five barangays; Aglayan, Kalasungay, Cabangahan, San Jose, Nasuli and two respondent for each two barangay Sugpong and Kasisang.

Legend: () - Total Number
[] - Processor/Trader/Shipper

C. Other Marketing Participants

LOCATION Province/Municipality/ Barangay	OTHERS							TOTAL
	Sheller Operators	Sheller Fabricators	Shipping Companies	Input Dealers	Hybrid Seed Companies	Institution/ Key Informants	Slaughter- house Operators	
MISAMIS ORIENTAL:								
o Cagayan de Oro City	1 (1)		3 (7)	10 (22)		12		26
Opol								
El Salvador								
o Claveria				1 (2)		3		4
Hinaplanan								
Ane-i								
BUKIDNON:								
Baungon								
Manolo Fortich								
o Malaybalay				3 (11)	2 (2)	4		9
Magsaysay						3		3
Aglayan				1 (5)		1		2
Nasuli					1 (1)			1
Valencia				3 (11)				3
Maramag a/	1			1 (5) ^{a/}				2
o Don Carlos		1 (1)		2 (4)				3
New Visayas								
Pualas								
Calac-calao - (Near Pualas)								
Pangantucan								
o Kalilangan	3 (7)	2 (2)		2 (5)		5		12
Kibaning								
Kinura - (Near Kibaning)								
Lampanusan						1		1
o Wao	3 (4)					5		8
Milaya								
Katutungan								
Sub-total	8	3	3	23	3	34	0	74
CEBU:								
o Cebu City			4	1		7	3	15
Mandaue			1	1				2
Consolacion								
Liloan								
Talisay								
Sub-total	0	0	5	2	0	7	3	17
TOTAL	8	3	8	25	3	41	3	92
OVER-ALL TOTAL								92

a/ - Four out of five input dealers in Maramag are also traders.

Legend: () - Total Number

APPENDIX 3

PERCENTAGE SHARE OF CORN IN NATIONAL FOODGRAIN AREA
AND CROP HARVEST AREA, 1980-1987

Year	% Share in Foodgrain Area	% Share in Crop Harvest Area
1980	0.48	0.25
1981	0.49	0.26
1982	0.50	0.26
1983	0.51	0.26
1984	0.51	0.26
1985	0.51	0.27
1986	0.51	0.27
1987	0.53	0.29

Source: Bureau of Agricultural Statistics

APPENDIX 4

GROSS VALUE ADDED (GVA) IN AGRICULTURAL CROPS (AT CONSTANT 1972 PRICES)
AND SHARE TO GROSS NATIONAL PRODUCT (GNP), PHILIPPINES, 1980-1989
(Level In Million Pesos, Share In Percent)

YEAR	Pulay			Corn			Coconut			Sugarcane			Banana			Other Crops		
	Level	Share	% Change	Level	Share	% Change	Level	Share	% Change	Level	Share	% Change	Level	Share	% Change	Level	Share	% Change
1980	4169	5.51	5.60	1447	1.56	1.69	1313	1.42	3.39	1322	1.43	-3.22	825	0.90	15.69	6849	6.32	7.72
1981	4307	4.50	3.31	1491	1.56	3.25	1396	1.46	6.32	1337	1.40	1.13	778	0.90	-5.81	6108	6.38	4.39
1982	4489	4.60	4.23	1522	1.56	1.87	1370	1.40	-1.86	1544	1.58	15.48	792	0.90	1.80	6215	6.37	1.79
1983	3900	3.95	-13.12	1373	1.39	-9.79	1210	1.22	-11.68	1133	0.10	-26.62	903	1.00	14.02	6449	6.53	3.77
1984	4201	4.58	7.72	1470	1.60	7.06	932	1.04	-21.32	1332	1.45	17.56	903	1.00	0.55	6701	7.31	3.91
1985	4665	5.31	11.04	1698	1.93	15.51	1420	1.62	49.16	829	0.94	-37.76	931	1.06	2.53	6991	7.84	2.84
1986	4893	5.47	5.02	1798	2.01	5.89	1821	2.03	28.24	775	0.86	-6.51	935	1.04	0.43	6947	7.64	-0.64
1987	4513	4.76	-1.88	1872	1.97	4.12	1903	1.90	-0.99	701	0.74	-8.55	878	0.93	-6.10	6907	6.97	-3.51
1988	4788	4.73	6.09	1924	1.90	2.78	1650	1.63	-8.48	772	0.76	10.13	844	0.83	-3.87	6519	6.48	-0.88
1989 I/	1286	4.92	3.13	399	1.52	6.12	301	1.15	-7.10	420	1.61	4.74	194	0.74	-1.52	1762	6.74	-0.06
GR 1980-1989	2.44			3.60			0.53			-4.37			2.13			2.15		

I/ First Semester of 1989

Source: National Statistical Coordination Board (NSCB)

NATIONAL PRODUCTION, AREA AND YIELD OF WHITE AND YELLOW CORN, 1980-1989

Year	PRODUCTION (000 MT)			AREA (000 Ha)			YIELD (MT/Ha)		
	White Corn	Yellow Corn	Total	White Corn	Yellow Corn	Total	White Corn	Yellow Corn	Total
1980	2,716.5	406.3	3,122.8	2,761.5	439.6	3,201.1	0.98	0.92	0.98
1981	2,708.7	401.3	3,110.0	2,763.4	475.3	3,238.7	0.98	0.84	0.96
1982	2,715.0	575.2	3,290.2	2,800.4	560.3	3,360.7	0.97	1.03	0.98
1983	2,512.1	613.8	3,125.9	2,600.2	557.3	3,157.5	0.97	1.10	0.99
1984	2,511.3	834.9	3,346.2	2,624.1	641.1	3,265.2	0.96	1.30	1.02
1985	2,486.2	952.6	3,438.8	2,630.1	684.5	3,314.6	0.95	1.39	1.04
1986	2,835.7	1,086.3	3,922.0	2,777.2	767.6	3,544.8	1.02	1.42	1.11
1987	2,857.6	1,157.5	4,015.1	2,693.1	871.2	3,564.3	1.06	1.43	1.13
1988			4,427.9			3,745.1			1.18
1989			4,522.2			3,689.2			1.23

Source: Bureau of Agricultural Statistics.

APPENDIX 6

REGIONAL DISTRIBUTION OF CORN PRODUCTION, 1980-1989

Region No.	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	in metric tons									
PHILIPPINES	3,050,200	3,295,765	3,404,085	3,134,095	3,250,305	3,862,805	4,090,730	4,278,119	4,427,951	4,522,195
Ilocos	31,990	31,070	42,370	49,440	53,230	60,790	55,170	63,830	67,792	66,884
Cagayan Valley	185,948	269,536	251,279	222,317	292,217	351,314	358,150	398,517	438,167	448,692
Central Luzon	5,615	4,720	6,160	6,045	5,880	7,610	8,530	9,307	11,752	12,888
Southern Tagalog	263,140	261,425	247,270	254,200	197,325	239,605	250,030	248,084	235,185	222,179
Bicol	115,870	96,525	106,610	114,530	112,000	131,960	138,575	121,415	138,030	127,021
Western Visayas	35,460	39,040	52,635	49,315	31,725	40,650	51,330	61,342	50,537	45,222
Central Visayas	227,030	238,625	254,890	272,740	213,090	241,155	264,945	269,177	286,041	280,147
Eastern Visayas	172,255	218,195	223,005	184,810	216,030	234,145	212,900	216,290	219,455	217,190
Western Mindanao	171,950	183,435	206,120	202,525	165,665	216,605	216,005	223,539	241,438	246,726
Northern Mindanao	242,485	225,595	213,455	212,415	177,960	237,590	274,455	305,735	355,347	428,360
Southern Mindanao	1,008,620	1,037,645	1,153,920	999,640	1,058,200	1,216,195	1,277,725	1,318,665	1,283,523	1,294,320
Central Mindanao	572,575	670,635	626,785	547,615	707,860	866,370	962,355	1,020,130	1,063,444	1,108,042
CAR *	17,262	19,319	19,586	18,503	19,073	18,816	20,560	22,088	28,177	24,524

* Cordillera Autonomous Region

APPENDIX 7

NATIONAL DEMAND AND SUPPLY OF CORN, 1980-1987

ITEM	1980	1981	1982	1983	1984	1985	1986	1987
	----- (000 MT) -----							
TOTAL SUPPLY	3,560.1 (100.00)	3,767.4 (100.00)	3,980.4 (100.00)	3,926.3 (100.00)	3,751.8 (100.00)	4,325.5 (100.00)	4,522.0 (100.00)	4,575.0 (100.00)
Carryover stock	258.0 (7.25)	218.6 (5.80)	235.5 (5.92)	263.9 (6.72)	319.1 (8.51)	181.5 (4.20)	431.1 (9.53)	241.1 (5.27)
Production	3,052.2 (85.73)	3,295.7 (87.48)	3,404.0 (85.52)	3,134.0 (79.82)	3,250.3 (86.63)	3,862.8 (89.30)	4,090.7 (90.46)	4,278.1 (93.51)
Imports	249.9 (7.02)	253.1 (6.72)	340.9 (8.56)	528.4 (13.46)	182.4 (4.86)	281.2 (6.50)	0.16 (0.01)	55.8 (1.22)
TOTAL DEMAND	3,308.1 (100.00)	3,535.1 (100.00)	3,717.6 (100.00)	3,599.4 (100.00)	3,569.5 (100.00)	3,864.1 (100.00)	4,286.2 (100.00)	4,444.9 (100.00)
Food	1,577.5 (47.69)	1,551.5 (43.89)	1,559.5 (41.95)	1,493.5 (41.49)	1,491.2 (41.78)	1,569.5 (40.62)	1,518.8 (35.43)	1,597.9 (35.95)
Seeds	64.0 (1.93)	65.9 (1.86)	67.6 (1.82)	62.6 (1.74)	64.5 (1.81)	70.2 (1.82)	71.9 (1.68)	65.1 (1.46)
Feeds, wastes and others	1,666.6 (50.38)	1,917.7 (54.25)	2,090.5 (56.23)	2,043.3 (56.77)	2,013.8 (56.42)	2,224.4 (57.57)	2,695.5 (62.89)	2,781.9 (62.59)

Note: (%) are percentage shares in either supply or demand

Source: Bureau of Agricultural Statistics

APPENDIX 8

REGIONAL DISTRIBUTION OF CORN AREA, 1980-1989

Region No.	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	in hectares									
PHILIPPINES	3,198,960	3,294,750	3,382,930	3,131,950	3,226,950	3,510,910	3,594,970	3,682,650	3,745,100	3,689,240
Ilocos	46,350	42,630	51,110	53,430	59,470	63,920	65,850	72,460	75,610	71,960
Cagayan Valley	272,490	317,060	292,530	294,500	295,200	316,970	324,800	333,200	346,400	347,690
Central Luzon	8,530	7,100	8,130	8,400	8,820	9,780	10,670	10,210	12,010	13,020
Southern Tagalog	224,730	239,950	271,410	271,430	231,800	245,500	250,480	255,140	248,560	237,530
Bicol	179,310	159,630	165,790	159,000	156,850	173,550	180,070	187,290	194,490	186,950
Western Visayas	71,360	64,920	76,780	63,730	69,630	83,100	100,930	114,150	115,250	88,360
Central Visayas	473,140	481,970	490,280	469,470	482,070	517,360	533,490	530,190	541,500	532,620
Eastern Visayas	186,980	203,920	206,820	194,370	197,510	213,240	219,290	229,800	225,040	227,210
Western Mindanao	251,780	268,150	277,290	270,620	251,350	288,400	295,730	293,730	299,110	269,160
Northern Mindanao	285,430	234,700	229,800	197,420	203,420	235,840	244,840	272,340	288,310	313,520
Southern Mindanao	738,100	760,050	803,500	739,730	747,760	791,680	764,810	770,460	778,360	773,260
Central Mindanao	441,220	493,020	491,420	390,670	505,640	553,010	580,420	592,570	598,860	606,190
CAR *	19,340	21,650	18,070	19,180	18,400	18,560	20,590	21,110	21,600	21,770

* Cordillera Autonomous Region

Source: Bureau of Agricultural Statistics

APPENDIX 9

NFA MONTHLY WHITE AND YELLOW CORN IMPORTATION, PHILIPPINES, 1980-1989
(Volume in metric tons, value in thousand U.S. dollars)

MONTH	1980		1981		1982		1983		1984		1985		1986		1987		1988		1989		
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value											
January			48,285	9,069			27,406	3,588			24,816	3,218					25,000	3,130			
February			26,875	5,447	42,462	6,339	26,219	3,286			16,150	2,024									
March	13,964	2,215	52,644	10,766	47,684	7,001	50,733	6,622	5,000	824	56,640	7,106									
April	29,318	4,652	24,600	4,587	87,244	12,054	104,629	14,783			33,497	4,426							11,000	1,604	
May	25,210	4,007	54,406	10,340	55,214	8,293	72,478	11,034	39,003	5,226	57,140	7,406							34,443	5,284	
June	25,003	4,033	18,400	3,296	10,026	1,682	25,808	4,134	72,050	12,621	47,612	6,700									
July	25,259	4,227	8,847	1,579	27,038	4,005	107,800	17,643	50,025	8,816	15,000	2,065			49,002	5,500					
August	26,250	4,316					35,500	5,432	23,976	3,825											
September	24,748	4,578					34,706	5,304													
October	20,707	5,017			21,737	2,106	35,300	5,425											50,900	8,707	
November	22,150	4,012	22,017	3,417	24,927	3,141															
December					24,001	2,916								5,610 donation						82,601	8,125
TOTAL	218,500	37,177	256,344	49,410	342,003	49,007	520,640	77,248	181,054	31,218	259,865	33,084	5,610	0	49,002	5,500	25,000	3,130	188,304	23,900	

Source: National Food Authority

APPENDIX 10

POPULATION PROJECTIONS, DENSITY, ANNUAL GROWTH RATE
AND MIGRATION TRENDS BY PROVINCE, 1985-1989

a. Population Projection by Province, 1985-1989

PROVINCE	1985	1986	1987	1988	1989
Agusan del Norte	419,937	431,027	442,313	453,801	465,405
Agusan del Sur	310,453	319,921	329,572	339,395	349,373
Bukidnon	756,104	783,799	812,508	842,269	874,924
Camiguin	60,865	61,383	61,904	62,423	62,923
Misamis Oriental	433,843	442,708	451,601	460,499	469,384
Misamis Occidental	807,237	831,263	855,759	880,632	905,821
Surigao del Norte	420,457	431,524	442,718	454,025	465,455
Northern Mindanao	3,208,906	3,301,623	3,396,275	3,493,044	3,593,225

b. Population Density by Province, 1985-1989

PROVINCE	LAND AREA (Sq. km.)	DENSITY				
		1985	1986	1987	1988	1989
Agusan del Norte	2590.3	162.1	166.4	170.8	175.2	179.6
Agusan del Sur	8965.5	34.6	35.7	36.8	37.9	38.9
Bukidnon	8293.8	91.2	94.5	98.0	101.6	105.5
Camiguin	229.8	264.8	267.1	269.4	271.6	273.8
Misamis Oriental	1939.3	223.7	228.3	232.8	237.4	242.0
Misamis Occidental	3570.1	226.1	232.8	239.7	246.7	253.7
Surigao del Norte	2739.0	153.5	157.5	161.6	165.7	169.9
Northern Mindanao	28327.8	113.3	116.5	119.8	123.3	126.8

* Based on population projections.

c. Population Projections Annual Growth Rates for Region 10 & its Provinces, 1985-89

PROVINCE	1985	1986	1987	1988	1989
Agusan del Norte	2.64	2.62	2.60	2.56	2.53
Agusan del Sur	3.05	3.02	2.98	2.94	2.91
Bukidnon	2.76	2.73	2.69	2.66	2.63
Camiguin	0.85	0.85	0.84	0.80	0.77
Misamis Oriental	2.04	2.01	1.97	1.93	1.89
Misamis Occidental	2.98	2.95	2.91	2.86	2.81
Surigao del Norte	2.63	2.59	2.55	2.52	2.48
Northern Mindanao	2.68	2.65	2.61	2.58	2.54

** Series 2: Moderate Fertility Decline and Moderate Mortality Decline.

d. Migration trends by Province, 1975-1980

PROVINCE	In Migration	Out Migration	Net Migration	Net Migration Rate
Agusan del Norte	20188	5455	14733	-3.9
Agusan del Sur	15844	4479	11465	5.4
Bukidnon	18313	15565	348	0.1
Camiguin	586	11235	-649	-1.2
Misamis Oriental	2330	15349	-12989	-3.6
Misamis Occidental	49680	7659	41821	7.5
Surigao del Norte	25767	5283	20484	9.8
Northern Mindanao	133438	68225	75213	1.7

Source: National Statistics Office, and
The Net Migration of the Provinces of Northern Mindanao, 1983
by Magtajas and Palasan

APPENDIX 11

PROVINCIAL DISTRIBUTION OF CORN PRODUCTION IN NORTHERN MINDANAO, 1981-1989

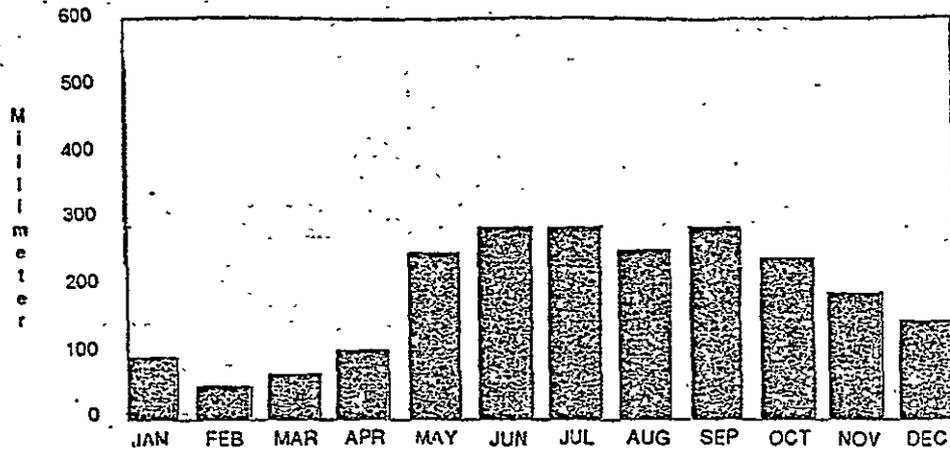
	1981	1982	1983	1984	1985	1986	1987	1988	1989
NORTHERN MINDANAO									
Production (MT)	225,595	213,465	212,415	177,960	237,590	274,455	305,735	355,347	428,360
Area Harvested (Ha.)	234,700	229,800	197,420	203,420	235,840	244,840	272,340	288,310	313,520
Yield/Ha. (MT)	0.96	0.93	1.08	0.88	1.01	1.12	1.12	1.23	1.37
AGUSAN DEL NORTE									
Production (MT)	17,740	15,455	14,950	14,945	17,760	19,650	21,660	25,331	24,816
Area Harvested (Ha.)	23,400	23,150	21,120	20,940	22,340	18,950	24,280	26,650	26,460
Yield/Ha. (MT)	0.76	0.67	0.71	0.71	0.79	1.04	0.89	0.95	0.94
AGUSAN DEL SUR									
Production (MT)	25,255	28,980	22,180	21,635	27,415	24,235	28,420	29,089	28,479
Area Harvested (Ha.)	23,970	25,630	21,410	19,880	24,370	17,910	18,970	20,690	21,760
Yield/Ha. (MT)	1.05	1.13	1.04	1.09	1.12	1.35	1.50	1.41	1.31
BUKIDNON									
Production (MT)	152,320	142,685	147,735	118,900	157,640	198,035	208,325	246,765	312,697
Area Harvested (Ha.)	144,840	141,880	120,870	132,000	153,520	169,600	180,200	185,970	200,360
Yield/Ha. (MT)	1.05	1.01	1.22	0.90	1.03	1.16	1.16	1.33	1.56
CAMIGUIN									
Production (MT)	335	295	160	330	690	805	875	1,094	668
Area Harvested (Ha.)	430	360	210	340	610	680	770	1,010	580
Yield/Ha. (MT)	0.78	0.82	0.76	0.97	1.13	1.18	1.14	1.08	1.15
MISAMIS OCCIDENTAL									
Production (MT)	5,100	3,740	4,030	4,680	11,190	11,295	17,825	15,049	16,907
Area Harvested (Ha.)	11,120	7,720	6,920	7,310	9,370	11,120	16,250	16,600	17,320
Yield/Ha. (MT)	0.46	0.48	0.58	0.64	1.19	1.02	1.10	0.90	0.98
MISAMIS ORIENTAL									
Production (MT)	24,425	21,725	22,835	16,935	22,075	21,745	27,610	37,292	44,038
Area Harvested (Ha.)	30,210	29,990	25,970	22,020	24,670	25,930	30,290	36,140	45,910
Yield/Ha. (MT)	0.81	0.72	0.88	0.76	0.89	0.86	0.91	1.03	0.96
SURIGAO DEL NORTE									
Production (MT)	420	585	525	535	820	680	1,020	727	755
Area Harvested (Ha.)	730	1,070	1,445	930	960	1,250	1,530	1,190	1,130
Yield/Ha. (MT)	0.58	0.55	0.36	0.58	0.85	0.54	0.65	0.61	0.67

Source: Bureau of Agricultural Statistics

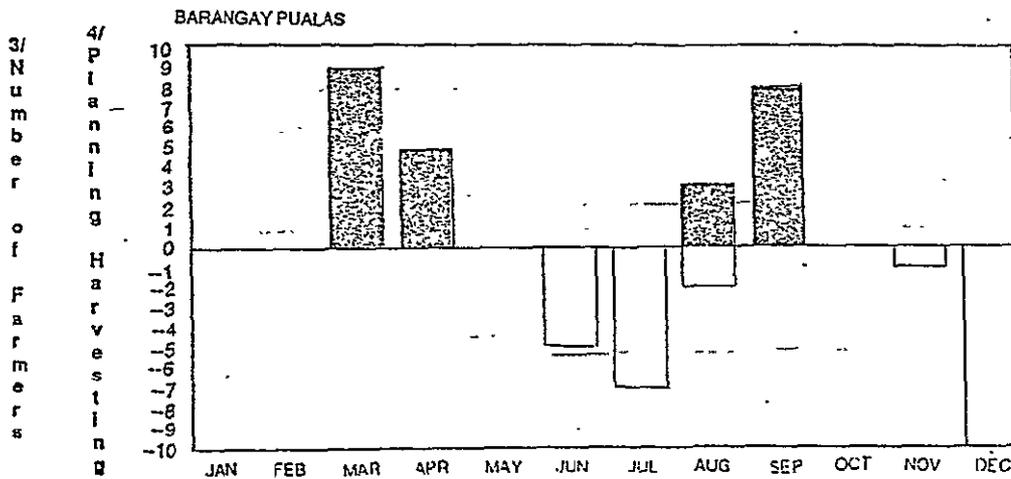
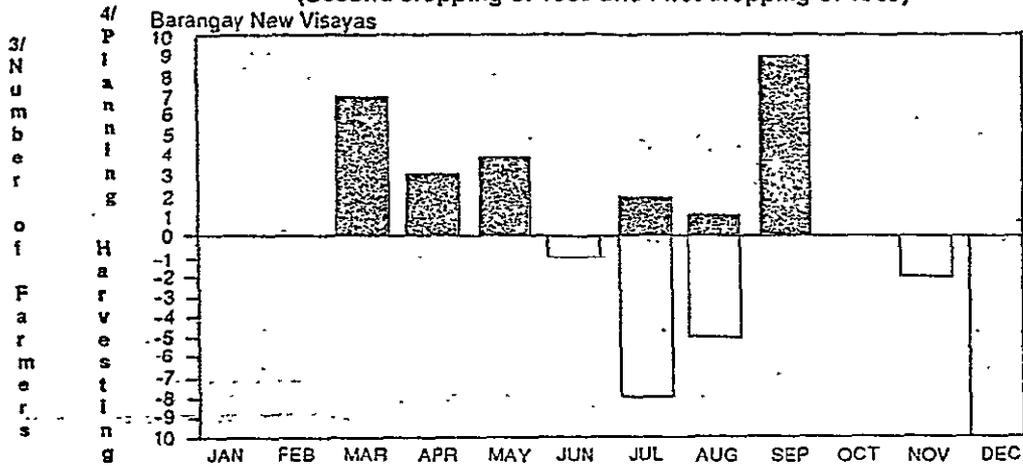
Appendix 12

1/

RAINFALL PATTERN OF DON CARLOS, BUKIDNON, 1985-1988



CROPPING PATTERN OF SAMPLE FARMERS IN NEW VISAYAS & PUALAS, DON CARLOS 2/ (Second cropping of 1988 and First cropping of 1989)

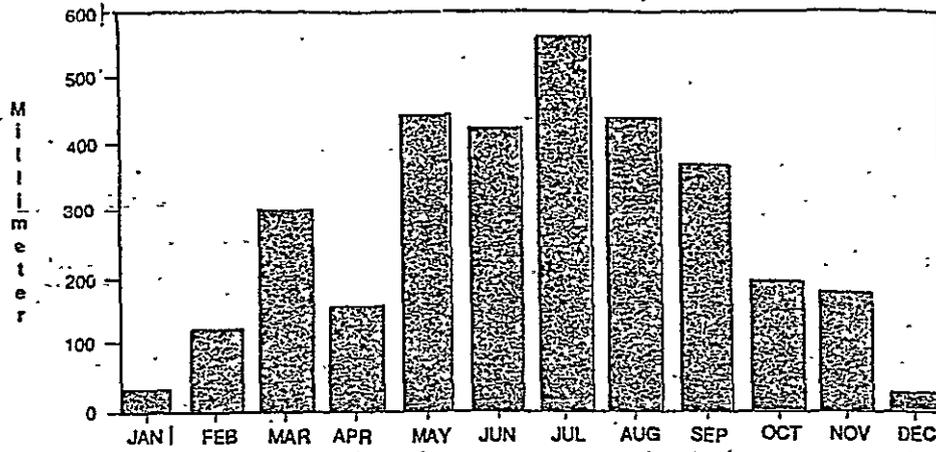


- 1/ Source of rainfall data, CMU, Musuan, Maramag, Bukidnon
- 2/ Source of cropping pattern data were farmer interviews.
- 3/ Fourteen farmer respondents in each barangay were interviewed.
- 4/ Two white corn growers did not plant during the second cropping of 1988.

Appendix 13

1/

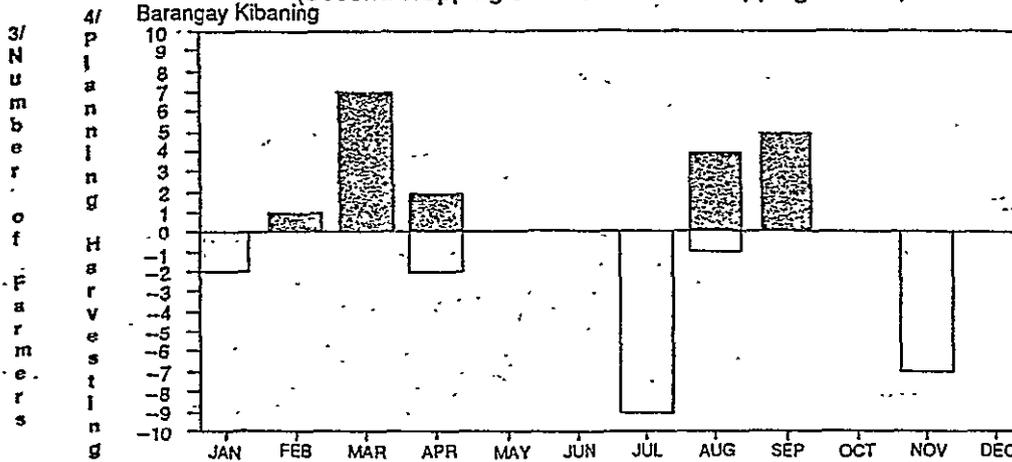
RAINFALL PATTERN OF KALILANGAN, BUKIDNON, 1988-1989



2/

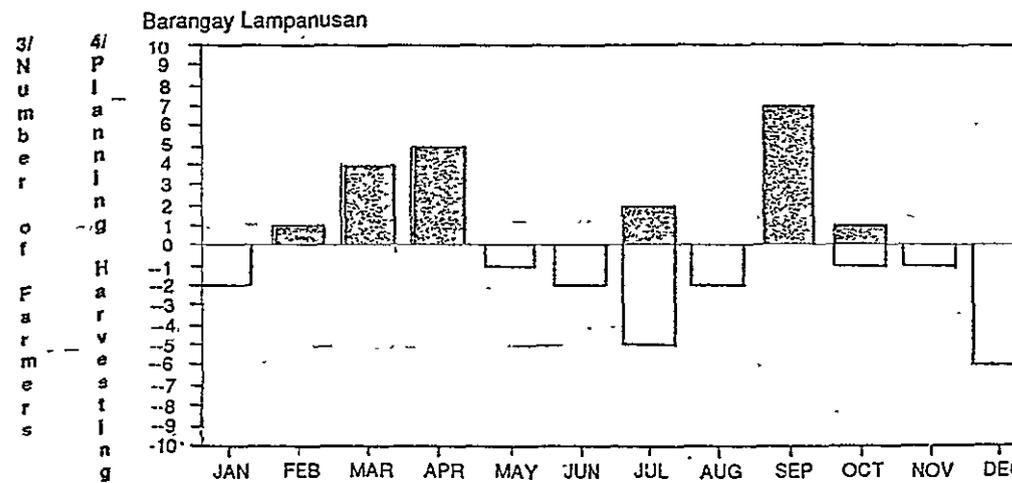
CROPPING PATTERN OF SAMPLE FARMERS IN KIBANING & LAMPANUSAN, KALILANGAN.

(Second cropping of 1988 and First cropping of 1989)



3/ Number of Farmers

4/ Planning Harvesting



3/ Number of Farmers

4/ Planning Harvesting

- 1/ Source of rainfall data, Department of Agriculture, Kalilangan.
- 2/ Source of cropping pattern data were farmer interviews.
- 3/ Ten respondents in each barangay were interviewed.
- 4/ One white corn grower in Milaya did not plant during the second cropping of 1988

APPENDIX 14

AGRO-CLIMATIC FACTORS CONDITIONING CORN PRODUCTION OF SAMPLE FARMERS BY BARANGAY, FIRST CROPPING SEASON, 1989

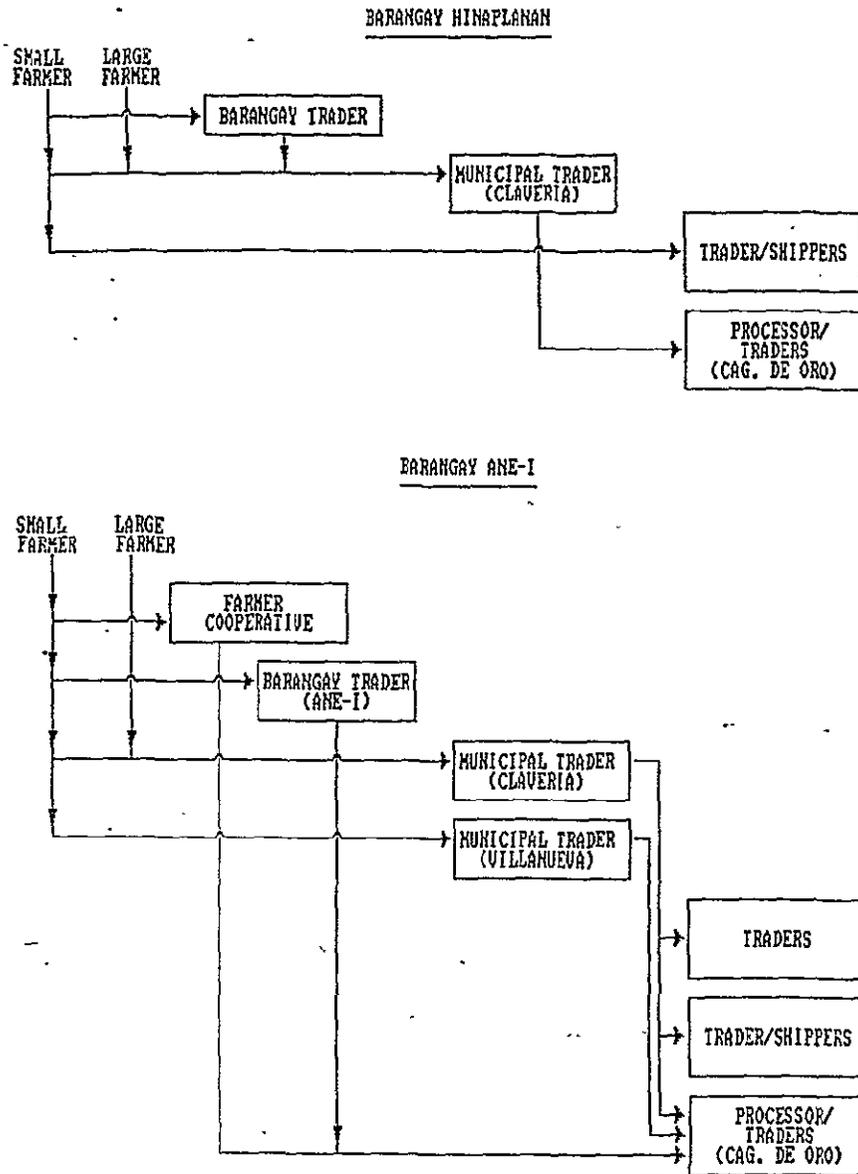
MUNICIPALITY	CLAVERIA	MALAYBALAY	DON CARLOS	KALILANGAN	WAO	TOTAL						
AGRO-CLIMATIC FACTORS FARMERS FIELD	Hinaplanan (n=10)	ANE-I (n=10)	Magsaysay (n=13)	Aglayan (n=14)	New Visayas (n=14)	Pualas (n=14)	Kibaning (n=10)	Lampunasan (n=10)	Milaya (n=10)	Katutungan (n=10)	N=115	%
Number of Farmers												
A: SOURCE OF WATER												
Rainfed	10	10	13	14	14	14	10	10	10	10	115	100
Canal	0	0	0	0	0	0	0	0	0	0	0	0
Pump	0	0	0	0	0	0	0	0	0	0	0	0
B: SOIL TYPE												
Clay	6	0	1	9	0	1	0	0	1	1	19	17
Loam	0	2	8	6	2	8	2	1	2	1	31	27
Clay-Loam	4	8	4	0	12	5	8	9	7	8	65	56
C. DRAINAGE												
Good	8	8	12	5	7	10	9	9	6	9	83	72
Fair	2	1	1	9	7	4	1	1	3	1	30	25
Poor	0	1	0	0	0	0	0	0	1	0	2	2
D. RAINFALL DISTRIBUTION												
Even	1	9	0	7	1	0	3	2	1	2	26	22
Distinct	8	0	11	7	10	14	5	3	7	6	71	62
Irregular	1	1	2	0	3	0	2	5	2	2	18	16
E. SLOPE												
Flat	8	6	1	6	3	8	1	8	2	9	62	45
Rolling	2	4	10	7	11	6	8	2	7	1	63	51
Hilly	0	0	2	1	0	0	1	0	1	0	6	4

Source : Farmer Interviews

APPENDIX 15

FLOW OF CORN FROM SELECTED BARANGAYS TO VARIOUS BUYERS AND LOCATION, FIRST CROPPING SEASON, 1939

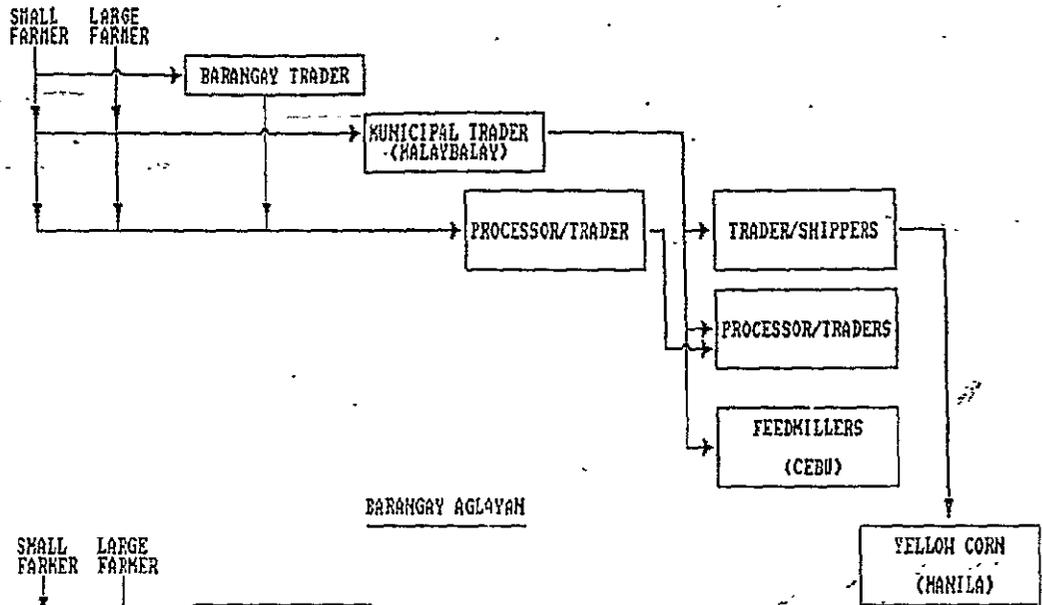
a. Flow of Corn from Barangays Hinaplanan and Ane-i, Claveria, Misamis Oriental



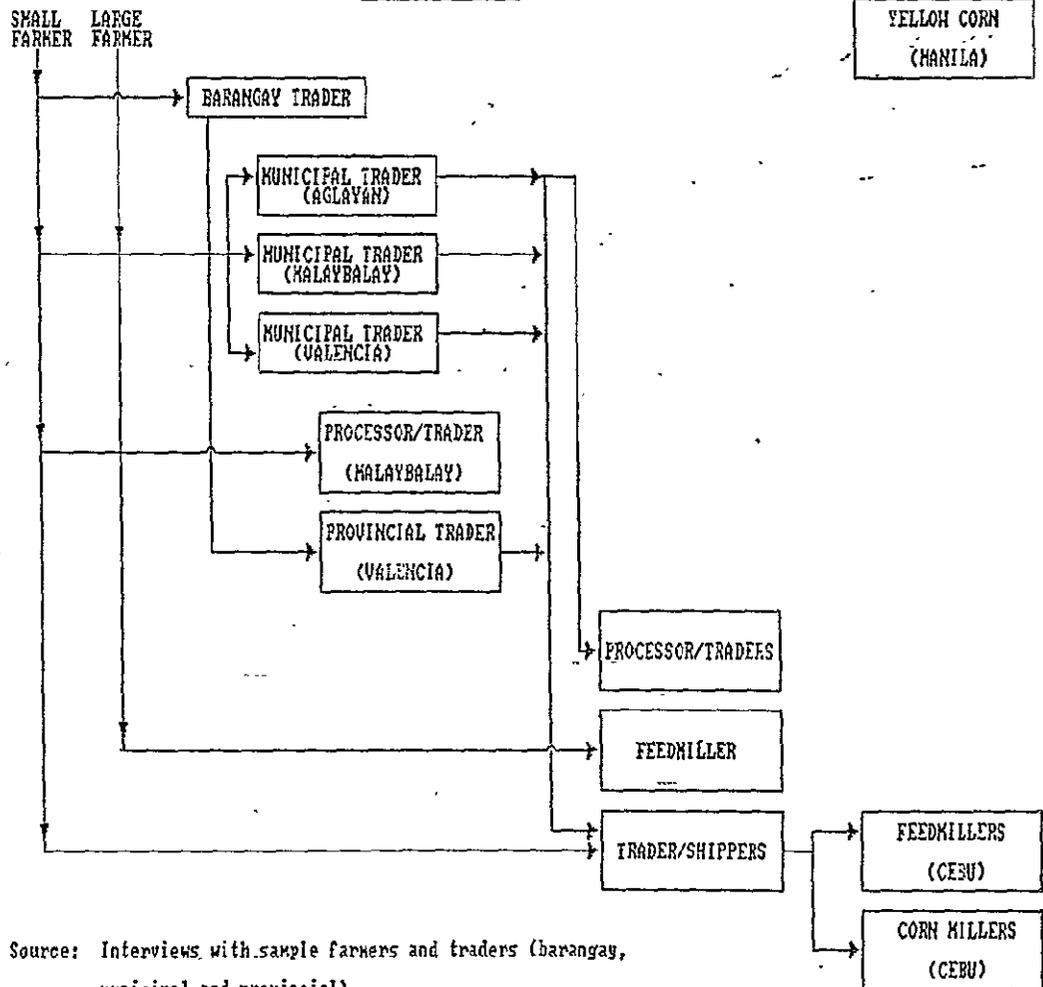
Source : Interviews with sample farmers and traders (barangay, municipal and provincial)

b. Flow of Corn from Barangays Magsaysay and Aglayan, Malaybalay, Bukidnon

BARANGAY MAGSAYSAY

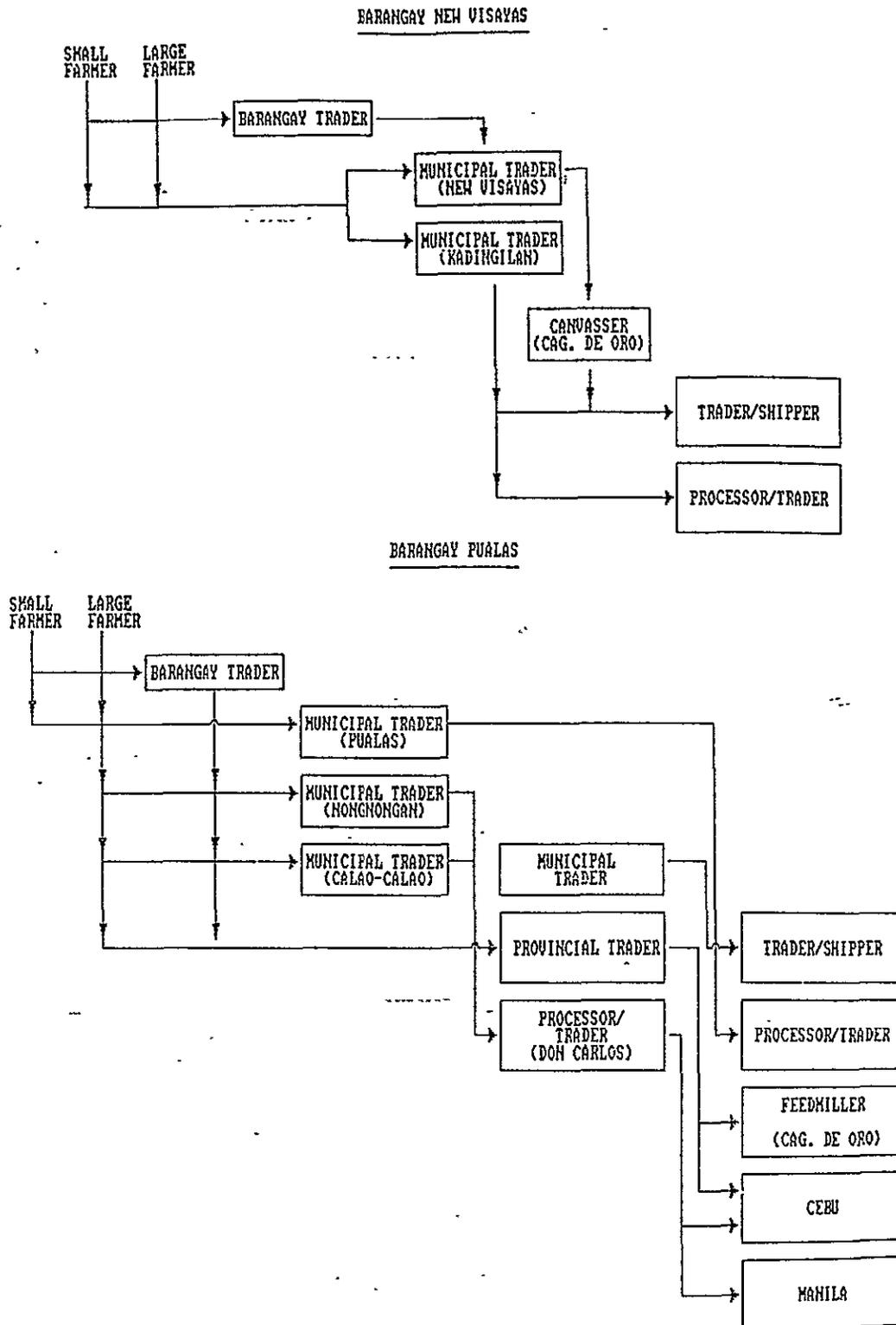


BARANGAY AGLAYAN



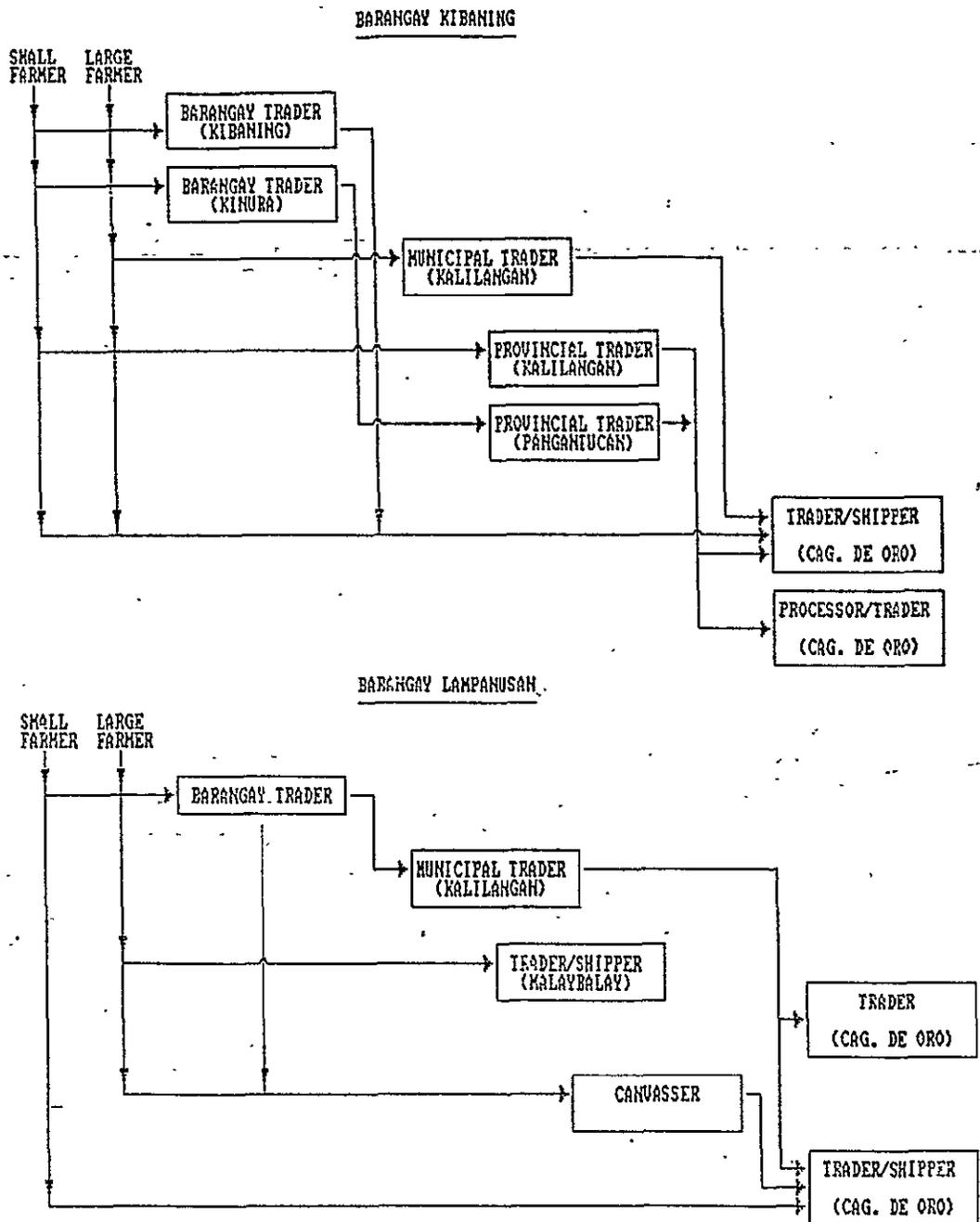
Source: Interviews with sample farmers and traders (barangay, municipal and provincial)

c. Flow of Corn from Barangays New Visayas and Pualas, Don Carlos, Bukidnon



Source: Interviews with sample farmers and traders (barangay, municipal and provincial)

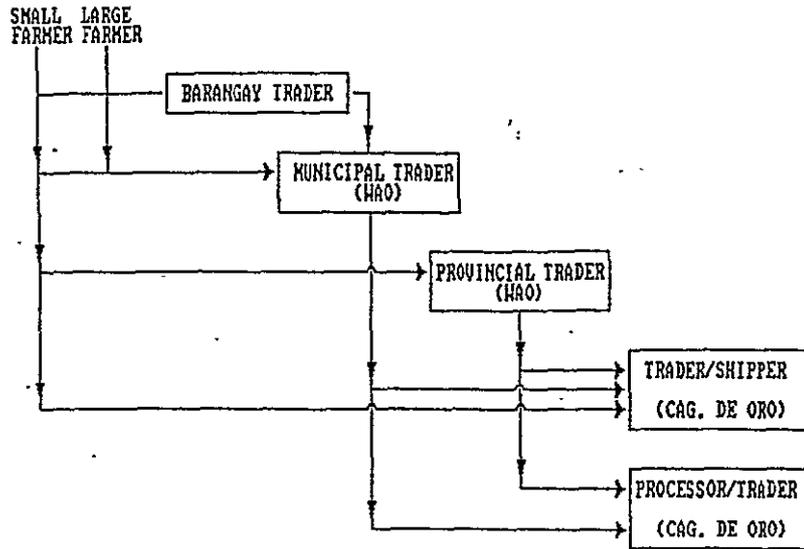
d. Flow of Corn from Barangays Kibaning and Lampanusan, Kalilangan, Bukidnon



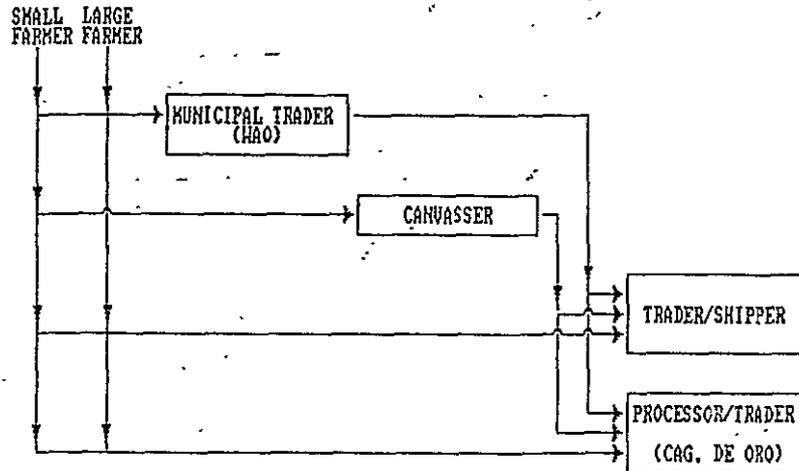
Source: Interviews with sample farmers and traders (barangay, municipal, and provincial)

e. Flow of Corn from Barangays Milaya and Katutungan, Hao, Lanao del Sur

BARANGAY MILAYA



BARANGAY KATUTUNGAN



Source : Interviews with sample farmers and traders (barangay, municipal and provincial)

APPENDIX 16

YEARLY OUTFLOW OF CORN GRAINS AND GRITS FROM CAGAYAN DE ORO
TO CEBU AND MANILA, 1986-1989 ^{1/}

YEAR	CEBU CITY	MANILA	OTHERS ^{2/}	TOTAL
(In Metric Tons)				
WHITE CORN GRAINS (WCN)				
1986	71,045	4,372	226	75,643
1987	67,501	7,747	1,800	77,048
1988	104,720	21,636	18,362	144,718
1989	109,345	32,590	23,587	165,522
YELLOW CORN GRAINS (YCN)				
1986	2,207	3,330	60	5,597
1987	3,157	9,103	0	12,260
1988	6,545	11,103	141	17,788
1989	12,320	13,060	4,291	29,671
WHITE CORN GRITS (WCT)				
1986	9,134	2,534	5,991	17,659
1987	9,169	4,403	3,416	16,988
1988	14,053	8,985	13,781	36,820
1989	8,465	7,588	7,472	23,526

1/ The 1986-1989 monthly outflow of corn grains and grits from Cagayan de Oro to the specific demand centers outside Region X is contained in the succeeding Appendix 17.

2/ "Others" refer to destinations which are the following: WCN: Tagbilaran, Jagna, Iligan, Dumaguete, Batangas, and Bacolod; YCN: Batangas, Dumaguete, Jagna and Bacolod; WCT: Tagbilaran, Jagna, Maasin, Camiguin, Ozamis, Surigao, and Dumaguete.

Source: National Food Authority, Region X

APPENDIX 17

MONTHLY OUTFLOW OF CORN GRAINS AND GRITS FROM CAGAYAN DE ORO TO SPECIFIC DESTINATIONS, 1986-1989

a. 1986 Monthly Outflow of Corn Grain and Grits from Cagayan de Oro

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 kg)													
White Corn Grains													
Cebu	176,633	112,944	130,208	133,631	40,698	42,055	97,611	134,615	141,203	173,392	73,357	164,442	1,420,909
Manila	1,865	219	23,787	12,521	1,200	1,242	8,898	3,100	3,260	23,202	5,345	2,799	67,438
Tagbilaran			2,000										2,000
Jagna	160	460						1,000					1,620
Iligan		900											900
Total	178,718	114,523	155,995	146,152	41,898	43,297	106,509	138,715	144,463	196,594	78,702	167,241	1,512,567
Yellow Corn Grains													
Manila	420	2,733	7,224	1,141	3,031	480	700	8,398	12,934	13,411		16,114	66,606
Cebu	1,434	16,081	2,085	5,140	2,186				4,009	4,354	3,360	5,492	44,141
Dumaguete		1,200											1,200
Total	1,854	20,036	9,309	6,281	5,217	480	700	8,398	16,943	17,765	3,360	21,606	111,949
White Corn Grits													
Cebu	12,546	17,425	10,950	18,310	9,802	13,750	15,244	25,054	17,853	13,378	13,284	15,075	162,676
Manila	4,911	1,335	5,830		5,609	2,770	4,420	5,329	11,544	2,000	6,920		50,648
Tagbilaran	6,435	5,900	4,630	3,450	4,635	2,265	4,750	4,800	9,615	9,964	1,100	5,265	62,529
Maasin	2,450	700	650	300			800	800	630				6,130
Surigao		580					375						955
Camiguin	2,362	298	1,719	3,020	1,383	647	1,785	3,023			827	1,280	16,344
Oroquieta	637	305				500							1,442
Jagna	2,500	160	600			200	3,150	5,425	2,000	4,450	1,850	9,580	29,915
Dumaguete						480	1,500						1,980
Total	31,841	26,713	24,419	25,080	21,429	20,612	32,024	44,431	41,667	29,792	23,981	31,200	333,180

Source: National Food Authority, Region X

b. 1987 Monthly Outflow of Corn Grains and Grits from Cagayan de Oro

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 kg)													
White Corn Grains													
Cebu	163,027	150,183	133,837	66,006	35,519	37,447	75,204	92,267	153,972	164,838	153,065	124,551	1,350,016
MMO	5,453	15,700	6,235	600	1,390	3,600	18,417	7,891	8,400	6,260	82,802	28,199	154,947
Dumagueta							7,900	3,890	1,800				8,400
Batangas													14,000
Total	168,480	165,883	140,072	66,606	36,909	41,047	101,521	104,048	164,172	171,098	205,867	175,250	1,540,953
Yellow Corn Grains													
Cebu	1,979	3,851	8,540	3,223	1,838	4,354	3,414	6,369	4,188	5,945	15,408	4,040	63,137
MMO	18,597	36,219	7,845		4,220	7,777	5,050	18,460	4,899	43,010	12,068	23,905	182,053
Total	20,576	40,070	16,385	3,223	6,058	12,131	8,464	24,819	9,085	48,955	27,476	27,948	245,190
White Corn Grits													
Cebu	23,834	16,845	13,466	10,969	7,989	5,813	6,751	21,516	18,479	16,734	20,142	20,851	183,339
MMO	5,010	5,827	5,032	8,102	2,065	810	1,413	9,549	5,435	11,972	12,819	16,219	88,053
Tagbilaran	2,650	6,178	1,900	4,102		2,615	4,925	3,200	7,034	1,995	300	5,358	40,257
Jagna	5,850	2,109	675		535		2,570	950	3,512	1,285	1,720	2,000	21,216
Massin	1,500	1,534											3,034
CMG	525	505		495	165	555	440	216		80		325	3,316
Ozamis													440
Total	35,494	28,850	20,338	23,173	10,054	9,038	13,089	34,265	30,948	30,701	33,251	42,428	311,699

Source: National Food Authority, Region X

c. 1988 Monthly Outflow of Corn Grains and Grits from Cagayan de Oro City

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 kgs)													
White Corn Grains													
Manila	74,850	32,504	22,140	23,520	34,720	18,380	44,460	35,475	44,775	33,522	31,820	36,524	432,720
Cebu	223,312	183,548	150,088	123,707	49,734	24,551	143,415	300,782	315,877	205,496	203,107	170,719	2,094,386
Dumaguete	4,000	2,000	37,000	17,200	8,000	2,000	8,000	16,000	14,400	8,600	10,200	27,520	154,920
Tagbilaran		423		2,490							1,782	1,300	5,995
Jagna		580	2,670	1,925				750	500	500		1,200	8,225
Batangas			52,500					14,000		39,000	52,000	40,500	198,000
Total	302,192	219,055	264,598	168,842	92,454	44,961	195,875	367,007	375,552	287,118	298,909	277,793	2,894,236
Yellow Corn Grains													
Manila	10,780	11,838	20,883	7,670	7,334	25,702	6,835	7,716	44,960	35,098	6,220	36,986	222,032
Cebu	14,148	8,940	14,144	13,900	8,198	12,784	4,744	8,670	22,960	12,181	4,676	5,546	130,891
Batangas	1,300												1,300
Tagbilaran			120									1,400	1,520
Total	26,228	20,798	35,147	21,570	15,532	38,486	11,579	16,386	67,920	47,279	10,896	43,942	355,763
White Corn Grits													
Manila	21,906	10,458	10,970	4,740	3,900	8,218	13,233	35,420	37,450	13,300	3,120	16,988	179,703
Cebu	31,107	20,199	22,822	15,376	12,260	21,485	25,523	19,445	39,560	21,300	24,284	27,686	281,067
Jagna	2,014	7,705	12,245	5,267	8,225	6,150	18,365	8,836	10,255	13,540	24,293	10,171	127,066
Tagbilaran	11,640	9,275	7,300	6,615	8,935	5,290	11,245	15,220	14,380	9,799	5,408	7,845	112,512
Leyte	3,450						1,850						5,300
Ozamis	1,380	1,015	2,710	183		546		362	400	200			6,786
Dumaguete	3,080				13,400	5,248	1,032					540	23,300
Camiguin	120			87		100							307
Total	74,697	48,652	56,047	32,168	46,720	47,037	71,248	79,283	102,065	58,139	57,105	63,230	736,391

Source: National Food Authority, Region X

d. 1989 Monthly Outflow of Corn Grains and Grits from Cagayan de Oro City

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 kgs)													
White Corn Grains													
Manila	41,814	32,912	52,000	103,680	15,720	16,200	22,607	91,140	137,102	14,740	35,640	89,207	651,792
Cebu	163,721	225,600	206,064	167,958	98,701	133,214	210,340	279,287	262,886	175,674	82,129	176,322	2,185,906
Dumaguete	19,000	14,808	4,000	11,735		9,000	4,000		18,760	13,360	6,700	7,200	106,563
Tagbilaran	1,000		20,792	5,800	1,000	1,600	6,679			200	720	2,600	40,391
Jagna			4,400	7,297	200	300	1,000			118	2,000	5,900	21,375
Batangas	10,500	23,430	22,800		32,400		50,050	55,313			20,800	20,600	277,243
Bacolod			9,000								15,175		24,175
TOTAL	235,035	296,780	319,116	296,589	146,021	165,314	294,676	425,740	418,948	239,867	147,789	321,579	3,310,445
Yellow Corn Grains													
Manila	6,977	8,420	23,010	35,563	3,789	5,580	14,903	45,154	40,792	56,830	1,042	16,120	261,200
Cebu	31,947	16,521	17,927	10,219	10,493	7,367	14,135	33,611	31,925	45,662	14,031	13,267	246,405
Batangas		41,304						35,000					76,304
Tagbilaran					500					483	720	410	2,113
Jagna			582							130		1,655	2,407
Bacolod										5,000			5,000
TOTAL	38,924	66,245	40,619	45,802	14,782	13,147	29,038	118,765	72,717	108,105	15,793	31,492	593,429
White Corn Grits													
Manila	18,166	11,746	24,925	18,033	11,325	4,297	5,040	24,001	19,042	9,021		6,040	151,759
Cebu	8,445	23,790	11,880	19,433	10,597	10,422	14,321	29,765	7,483	8,130	13,651	11,361	169,308
Jagna	8,994	6,235	9,540	2,375	3,000	3,750	8,110	6,700	8,268	2,940	1,500	4,700	66,112
Tagbilaran	5,470	7,950	7,195	4,221	3,675	8,538	8,430	9,176	9,470	3,234	10,084	2,010	79,453
Leyte													0
Ozamis				200									200
Dumaguete									2,880				2,880
Camiguin		250	252						300				802
TOTAL	41,095	49,971	53,795	41,262	28,597	27,107	35,901	69,612	47,443	23,345	25,245	24,111	470,514

Source: National Food Authority, Region X

APPENDIX 18

YEARLY INFLOW OF CORN GRAINS AND GRITS TO CEBU CITY BY SOURCE, 1985-1989

YEAR	CAGAYAN DE ORO	GENERAL SANTOS	COTABATO CITY	DAVAO CITY	OTHERS	TOTAL
(In Metric Tons)						
WHITE CORN GRAINS (WCN)						
1985	66,199	56,149	24,663	18,325	15,514	180,850
1986	59,736	39,021	23,885	13,350	26,433	162,426
1987	86,537	44,505	17,474	5,538	30,110	184,163
1988	108,820	38,988	21,326	921	33,538	203,593
1989	139,142	59,429	19,053	1,840	20,137	239,601
YELLOW CORN GRAINS (YCN)						
1985	337	258	0	316	534	1,444
1986	632	0	274	0	135	1,041
1987	4,311	867	2,816	14	1,901	9,909
1988	4,990	873	5,402	0	364	11,629
1989	7,976	827	703	8	742	10,255
WHITE CORN GRITS (WCT)						
1985	20,365	12,736	2,689	5,390	1,859	43,038
1986	14,719	9,262	2,331	13,516	1,498	41,626
1987	11,253	11,563	492	9,768	693	33,769
1988	15,287	16,124	283	5,688	1,086	38,468
1989	8,403	17,079	377	14,510	370	40,739

Source: National Food Authority, Cebu City

APENDIX 19

MONTHLY INFLOW OF CORN GRAINS AND GRITS TO CEBU CITY, BY SOURCE, 1985-1989

a. 1985 Monthly Inflow of Corn Grains and Grits to Cebu City

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 kgs)													
Corn Grains													
Ayhan de Oro	252,640	198,924	143,276	90,007	105,259	97,358	84,879	65,542	63,315	56,853	84,773	81,361	1,323,987
General Santos	60,967	96,936	153,907	152,506	119,420	90,756	108,762	96,335	66,072	49,054	65,487	57,817	1,122,979
Osobo City	25,949	65,864	40,513	60,853	23,718	22,689	51,493	52,948	57,487	22,647	40,964	24,152	495,257
San City	21,564	36,792	18,124	20,592	15,339	6,701	33,193	33,895	29,261	33,894	55,693	61,452	366,500
San City	6,947	1,491	1,379	1,013	2,088	5,611	3,614	3,669	1,551	2,968	3,026	3,423	37,083
San City	2,772	342			3,710	8,890	19,389	5,280	5,758	4,261	2,563	3,749	61,709
San City	4,799	1,441	1,496	1,140	4,054	4,308	1,708	2,701	2,708	2,358	1,965	4,527	33,205
San City				378	1,253	1,461	2,724	2,761	2,095				10,677
Delogan		82	159	981	4,060	1,655							6,937
Boanga City	1,504		342	2,366	2,290	2,762	7,175	20,926	21,334	24,420	12,023	12,532	107,674
Log City							1,334	432	3,214	16,288	6,384	17,412	45,064
Log City											820	1,042	1,862
Mayog			81	266	752	1,087							2,186
San City						1,015	2,862						3,877
TOTAL													3,618,997
Corn Grains													
Ayhan de Oro											6,730		6,730
San City	34	138	115	60							2,362	82	2,791
General Santos	37										5,120		5,157
Osobo City											2,800	3,514	6,314
San City	307	161	14	40							3,427	3,509	7,458
San City	72	52	67	26									217
Log City	22		52									134	208
TOTAL													28,875
Corn Grits													
Ayhan de Oro	63,305	44,459	24,973	18,722	25,487	28,051	34,088	28,515	24,953	36,912	32,278	45,561	407,304
General Santos	13,521	19,044	18,855	27,467	24,190	24,542	44,560	27,738	18,019	18,693	4,264	13,824	254,717
Osobo City	2,700	386	2,300	2,116	3,645	4,185	9,342	11,166	5,805	18,738	19,559	29,849	107,791
San City						265	519						784
Osobo City	1,058	6,072	1,334	3,680	3,005	2,894	4,110	7,887	13,237	4,098	1,692	4,715	53,782
San City	78						713						791
San City	764				3,875	2,121	1,807	3,549	3,394	5,472	1,794	5,267	28,063
San City						453							453
Boanga City				156		197	641	1,430			892		3,316
Log City	2,221	882										660	3,763
TOTAL													860,769

Source: National Food Authority, Cebu City

b. 1986 Monthly Inflow of Corn Grains and Grits to Cebu City

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 Kg)													
White Corn Grains													
Cagayan de Oro	112,704	110,489	68,065	88,369	89,757	85,405	83,472	72,500	66,920	130,678	116,926	170,437	1,187,313
General Santos	84,863	99,188	8,538	29,426	90,319	72,637	100,618	79,879	76,510	78,382	36,692	23,370	1,067,732
Cotabato City	45,810	25,992	2,464	27,429	31,320	27,226	60,771	76,857	49,078	83,366	14,921	32,442	500,252
Davao City	48,646	63,124	5,823	7,151	17,018	21,046	38,411	15,789	10,256	10,609	1,140	27,994	282,826
Iligan City	2,591	1,515		1,588	6,068	3,739	1,822	4,614	1,908	4,638	3,688	1,903	37,181
Butuan	6,372	1,866	596	3,866	3,411	6,257	1,606	11,675	3,153	6,434	27,877	37,181	129,999
Ozamis	1,487	2,159	127	4,068	5,147	3,538	4,099	4,971	2,485	3,193	1,560		29,532
Tubod	12,656	14,234	3,924	6,918					2,587				23,185
Ormoc	909	461	869	2,339							114		3,629
Catbalogan			4,455	2,289	1,722	7,092	4,773	8,576	7,179				26,600
Zamboanga City	24,981	34,233	2,834	10,342	11,865	15,937	20,253	9,719	14,609	5,780			131,708
Dipolog City	20,908	20,229	2,290	12,553	2,280	7,575	4,808	12,253	9,802	1,135	912		83,535
Calbayog				2,761						1,704			4,465
Iloilo City			472										472
Dumaguete City											920		920
Bacolod										570			570
Aklan										113			113
TOTAL													
Yellow Corn Grains													
Cagayan de Oro			1,158	307		634		620		634	3,166	6,122	11,637
Cotabato											1,184	4,204	5,388
Dumaguete City										865	569	1,226	2,660
TOTAL													
White Corn Grits													
Cagayan de Oro	43,522	28,036	9,901	30,658	22,921	31,059	29,678	25,796	22,553	30,806	10,508	9,593	263,403
General Santos	17,358	12,781	2,219	10,144	21,485	23,576	25,720	10,075	12,963	14,568	22,024	12,346	156,895
Davao City	23,738	12,991	2,466	7,201	11,471	5,693	46,820	43,766	33,969	31,079	32,888	24,674	285,185
Ozamis City											170		170
Cotabato City	719	857		1,506		8,812	9,600	8,206	7,279	3,141	4,618	1,882	48,810
Iligan	891				107	471						280	1,649
Butuan City	5,518	1,294	610	2,806	385	2,579	1,092	882	367				13,514
Zamboanga City	1,616	1,027			1,607			821		688			4,139
Dipolog City		750			1,025		1,919	1,112	561				5,317
Manila												230	230
TOTAL													

Source: National-Food Authority, Cebu City,

c. 1987 Monthly Inflow of Corn Grains and Grits to Cebu City

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 Kg)													
White Corn Grains													
Cagayan de Oro	184,291	150,136	153,620	97,803	55,139	69,202	121,249	188,709	179,530	200,131	176,780	155,119	1,730,731
General Santos	76,891	23,062	29,650	109,147	163,623	98,267	93,978	81,523	73,263	61,668	17,100	59,706	890,093
Cotabato City	26,233	32,585	37,010	17,149	55,714	52,160	17,660	34,956	40,899	10,866	8,550	14,497	349,479
Davao City	14,774	6,774	5,725	1,846	15,608	12,808	6,227	15,768	13,439	10,566	3,285	3,714	110,754
Iligan City	3,748	8,230	10,067	12,565	6,175	9,357	5,758	6,459	20,229	23,844	20,045	9,487	135,964
Butuan	12,207	476		878	479	6,504	39,132	33,164	14,098	12,671	19,044	17,231	155,884
Ozamis	22,793	19,370	4,909	4,934	2,933	5,194	18,185	21,510	33,890	12,252	5,716	10,911	162,597
Surigao del Sur							184	2,317	1,197		114		3,812
Ormoc				1,509	4,003	2,496			707	1,140	268	127	10,250
Catbalogan				2,693	5,164	1,824	3,078	425	1,140	1,037	319	456	16,136
Zamboanga City	1,710	964		855		205	1,140	9,033	20,539	2,166	1,482	800	38,894
Dipolog City	684		331				566	3,762	11,498	4,764		4,885	25,480
Tacloban			915	2,579	1,723	3,192	3,016	1,750	3,807	2,193	1,219	706	21,100
Northern Leyte	80			1,242	1,392	663			109	717		228	4,461
Bohol									473	668	1,264	1,835	4,240
Calbayog						570	4,053						4,653
Roxas City				1,106						1,255			2,371
Iloilo City										1,710	226	194	2,130
Camiguin				214									214
Negros Oriental													
Manila					5,095								5,095
Tagbilaran					798	855			399			2,440	4,492
Dumaguete City										566		793	1,379
Surigao City												490	490
TOTAL													3,683,264
Yellow Corn Grains													
Cagayan de Oro	4,319	4,150	5,243	11,082	3,813	4,945	4,604	5,601	4,942	17,987	15,308	4,220	86,214
Cotabato	2,941	3,463	8,228	1,624	696	4,560		6,220	16,270	9,827	2,000	500	56,329
Ozamis City	512	313	385	36				160	236	229	320	33	2,224
General Santos						6,242		10,100	1,000				17,342
Davao City 3		279											279
Butuan City							500						500
Iligan City							12			6,840			6,852
Zamboanga City									260	2,700			2,960
Iloilo City	49			1,640	1,192			1,100	8,536		500		13,017
Roxas City				1,120	1,077			374	7,878	228		100	10,777
Bacolod City									300				300
Bohol											23		23
Dumaguete City			599	205									804
Ormoc			274	91	91		105						561
TOTAL													198,182
White Corn Grits													
Cagayan de Oro	20,096	17,740	21,458	10,835	8,019	5,521	15,379	37,928	27,289	16,902	19,007	24,883	225,062
General Santos	22,611	21,627	9,763	14,105	27,493	17,145	32,521	17,556	12,583	25,733	9,575	20,133	231,250
Davao City	6,811	6,624	9,632	7,797	17,585	27,636	9,556	64,611	39,715	4,000		1,200	195,367
Ozamis City			566						1,466	221	106		2,359
Cotabato City			1,763	1,380	1,081				5,116			500	9,840
Iligan City	300		1,615						700				2,615
Butuan City							29	866	1,770				2,665
Catbalogan							500						500
Manila		408	350										758
Tacloban City			104							177			281
Dumaguete City			230										230
Ormoc							57						57
Northern Leyte					41	92						100	233
Bohol							10		224			2,045	2,279
Roxas City			488										488
Masbate				368									368
Bacolod city												1,000	1,000
TOTAL													675,392

Source: National Food Authority, Cebu City

d. 1988 Monthly Inflow of Corn Grains and Grits to Cebu City

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 Kg)													
White Corn Grains													
Cagayan de Oro	192,818	186,972	150,364	149,109	72,691	25,249	153,058	249,630	276,619	221,819	155,358	342,668	2,176,405
General Santos	54,235	65,983	41,977	131,908	68,773	95,923	111,491	81,602	45,288	6,612	14,535	61,441	779,768
Cotabato City	21,227	15,447	60,679	57,099	95,512	61,593	44,539	25,158	7,376	5,343	16,354	16,188	425,515
Davao City	1,596	2,280	2,565	2,580	3,361	3,221			1,838	976			18,417
Iligan City	19,574	26,412	49,731	38,568	22,010	19,053	12,052	30,623	12,472	18,549	18,728	16,408	284,180
Butuan	9,439	1,020	2,360	855	2,316	26,446	31,649	13,688	7,935	2,907	5,097	4,262	107,972
Ozamis	27,074	26,397	16,239	6,841	9,934	10,846	38,189	21,138	13,756	4,867	2,424	2,931	180,436
Surigao del Sur	171	912					228						1,338
Ormoc	769	519		1,020	2,508	610	1,517	997		456			8,670
Catbalogan			785	2,642	4,622	2,850	5,276	3,768	1,311	228	798	203	22,483
Zamboanga City	4,959	2,041	8,408		1,710	912		6,511	13,859	2,521	456		41,377
Tacloban		410	1,627	98		1,615	2,840	1,174	2,084	448	228	456	10,980
Northern Leyte	172				1,180	1,043	1,424	2,162	652				6,533
Southern Leyte				180	57								237
Bohol	570	856					228	1,197			114		2,964
Maabate		684							228				912
Calbayog						912			1,060				1,972
TOTAL													4,071,859
Yellow Corn Grains													
Cagayan de Oro	6,087	11,090	12,854	16,319	9,597	8,890	9,257	5,750	5,704	4,443	2,931	6,879	99,801
Cotabato		5,985	32,905	12,193	8,806	8,436		15,670	5,227	490	14,485	3,853	106,040
Ozamis City		878	766						399	194	428		2,655
General Santos		2,070	6,840	7,410					1,140				17,460
Iloilo City		342	589	225			228	1,257					2,641
Roxas City				1,655									1,655
Manila					319								319
TOTAL													232,581
White Corn Grits													
Cagayan de Oro	25,304	28,729	22,949	25,117	14,011	19,120	28,857	26,422	22,422	30,483	27,717	34,599	305,730
General Santos	17,620	13,218	17,348	58,536	21,850	28,026	27,670	43,887	20,259	24,503	19,000	30,565	322,482
Davao City	900		3,300	5,400	1,200	13,800	7,549	43,438	3,050	14,640	14,954	7,530	113,761
Ozamis City		720	660	260	1,148	680	995	1,546	1,227	200	150	623	8,209
Cotabato City			2,056		500		500			2,600			5,656
Iligan		700	-1,030	190	339				990		200		3,449
Catbalogan	500		485										985
Manila			350				260		450				1,060
Iloilo City					250						100		330
Tacloban City					322	253							575
Dumaguete City						6,265							6,265
Ormoc						145							145
Northern Leyte						300							300
Southern Leyte						150							150
Bohol									135				135
TOTAL													769,352

Source: National Food Authority, Cebu City

e. 1989 Monthly Inflow of Corn Grains and Grits to Cebu City

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
(Bags of 50 Kg)													
White Corn Grains													
Cagayan de Oro	227,476	166,999	275,120	222,781	100,186	179,229	291,528	392,269	349,536	220,053	138,603	219,055	2,782,845
General Santos	168,203	83,623	109,711	135,728	132,050	213,804	112,532	92,879	32,747	17,214	54,441	35,643	1,188,575
Cotabato City	27,968	33,983	59,581	47,226	14,905	46,471	27,273	49,261	19,118	9,560	16,575	28,833	381,054
Davao City		8,247	6,049	725	2,313	4,710		902	420	798	7,859	920	36,800
Iligan City	31,692	9,193	23,379	21,097	24,086	12,474	22,498	17,444	12,745	11,596	7,837	11,422	205,563
Butuan	2,165					9,630	2,720	991	150	9,094	24,635	6,875	55,260
Dumaguete	16,017					3,990							20,007
Ozamis	3,010	3,779	1,234	7,845	1,639	5,125	23,432	12,676	4,251	1,224	1,324	4,553	75,102
Surigao del Sur	912	798	570	888				114					3,282
Ormoc	148	713			703								1,564
Catbalogan					300	317	683	714	497		1,169		3,680
Zamboanga City						22,051	1,774	285		1,938	2,062	782	28,882
Tacloban						125	633	535					1,293
Zamboanga del Norte							1,403						1,403
Samar												1,015	1,015
No. Leyte												1,734	1,734
Surigao City												2,964	2,964
TOTAL													4,792,023
Yellow Corn Grains													
Cagayan de Oro	2,075	32,961	14,785	7,851	7,704	3,108	4,482	16,820	13,538	26,830	12,232	7,026	159,512
Cotabato	1,140	223	6,270		5,920			88	410				14,056
Ozamis City		194	332		941	490			1,561	325	288		4,131
General Santos			2,280	3,058	8,652	1,401			1,140				16,541
Davao City					152								152
Butuan					279								279
Holo City				1,025		223		2,950	228				4,332
Roxas City				1,625									1,625
Manila				4,195									4,195
Iligan City											534		534
TOTAL													205,099
White Corn Grits													
Cagayan de Oro	16,247	13,561	12,681	19,877	8,985	10,736	20,029	18,459	10,558	11,192	13,761	11,978	168,064
General Santos	32,685	33,648	27,622	34,941	53,117	31,001	32,176	37,294	10,706	5,960	17,813	24,516	341,579
Davao City	34,480	36,224	31,295	9,943	33,934	20,645	19,825	34,416	31,670	6,160	12,230	19,343	290,205
Ozamis City	461	1,004	355	230	379		150		254				2,833
Cotabato City		4,989	1,050									1,500	7,539
Iligan		700	625				820	130				1,000	3,275
Siquijor								30					30
Catbalogan								200					200
No. Leyte										200			200
Bohol											100		100
Butuan City												114	114
Zamboanga City												445	445
Dumaguete City								200					200
TOTAL													814,784

Source: National Food Authority, Cebu City

APPENDIX 20

PHYSICAL INFRASTRUCTURE OWNED BY SAMPLE PROVINCE GRAIN TRADERS.
(BARANGAY, MUNICIPAL, AND PROVINCIAL) IN BUKIDNON, WAO, LANAO DEL SUR AND CLAVERIA
MISAMIS ORIENTAL, FIRST CROPPING SEASON, 1989

a. Shelling and Drying Facilities

LOCATION	SHELLING 1/			DRYING 2/				
	#	%	CAPACITY (MT)/Hr	DESCRIPTION	#	%	CAPACITY (MT)	DESCRIPTION
CLAVERIA					1	2	2/batch	Mechanical
Hinaplanan					3	5	0.1-0.15	Mat/nets
Ane-I								
MALAYBALAY					1		9/ hr.	Mechanical
					2	5	2	Solar (Central)
Magsaysay					2	4	0.5-0.6	Cemented drying floors
Aglayan	1	9	3.5	Mechanical (stationary)	3	7	8-80	Cemented drying floors
					1			Mechanical (not used)
VALENCIA	2	18	7.5	Mechanical	3	7	5-20	Solar (cemented)
					1		0.15	Mat/nets
MARAMAG	1	9	2.5		2	4	1.7-14	Cemented floor
DON CARLOS					4	7	2.5-15	Solar cemented floors
New Visayas	1			Mechanical (stationary)	1		2	Brgy. basketball court
	2	28		Mechanical (travelling)	1	4	7.5	Solar cemented floors
Pualas					5		2.6	Cemented floor
					2	12	0.10-0.15	Nets
PANGANTUCAN					2	4	3.5-17	Solar cemented floors
KALILANGAN	1	9		Mechanical	7	12	1.5-22.5	Solar cemented floors
Kibaning	2	18		Mechanical (stationary)	2	4	0.75-3.0	Cemented floors (1 brgy. basketball court & 1 private use)
Lampanusan					1	2	.15	Amakan
WAO	1	9		Mechanical	6		5-13	Solar cemented floors
					2	14	9.5/hr	1 (functional)
Milaya					4	7	0.15	Amakan
Katutungan								
TOTAL	11	100			56	100		

1/ Shellers were available in the research areas, whereas these shellers are usually manual or "bangguran" which is commonly used by small farmers and barangay traders.

2/ Nets, amakan mats, even cut size sacks were usually used by small barangay in drying corn.

Source : Trader Interviews

b. Trucking and Storage Facilities

LOCATION	TRUCKING			STORAGE				
	#	%	CAPACITY (MT)	DESCRIPTION	#	%	CAPACITY (MT)	DESCRIPTION
LAVERIA	7		10-12	Six wheelers	3		15-50	Bodega type
	2		1.5	Jeepneys	1	6		
	2	8	3.5	Tractors			0.6	Storeroom
Sinaplanan					1		5	Bodega type
					1	5	10	Silo (bamboo made)
							0.5	Amakan
Inc-I	1		10-12	Six wheelers	1	1		Bodega type
MALAYBALAY	2			Tractor	3	6	10-60	Warehouse
	17	15	5-22	6-10 wheelers	1		2.5	Bodega
Magsaysay	1		0.15	Motorcycle	2		2.4-17	Bamboo made
	2	2	0.10	Motorola	2	6	1-6.8	Cemented house type
Iglayan	4		3.5	Tractors/ Trailers	1		5	A portion w/in the trading store
	5	9	2.2-12	Trucks				
	1		1.5	Jeep	3	6	300-350	Warehouse
ALENCIA	17	13	4-22	4-10 wheelers	7	11	10-50	Warehouse type
BARAMAG	1		11	6 wheelers				
	1	2	1.5	Jeep				
	1		3.5	Tractor	1	1	22	Warehouse type
DON CARLOS	14		9-22	6-10 wheelers				
	1	12	1	Fiera	4	6	30-500	Warehouse type
New Visayas	4	3	10-12	Six wheelers	1		18	Warehouse type
					2	5	0.5-2.5	Amakan
Calas	3		10-12	Six wheelers				Bodega type
	1	5	1.2	Jeep	2		22.5	Storeroom (residence)
	2		3.5	Trailer/ tractor	6	12	2-10	
INGANTUCAN	5	4	10-11	6 wheels	2	3	30	Warehouse type
BULANGAN	12	9	10-12	6 wheels	1		2.5	Bodega type
					6	11	0.15-10	Warehouse type
Isanig	1	0.7	12.5	Tractor	2	3	15-25	House type
Impanusan					2	3	5-6.5	Storeroom (residence)
IO	5		4-6	Tractors	9	14	6.5-1,500	Warehouse type
	17	17	10-15	Trucks				
Iaya					1	1	0.75	Storeroom (residence)
Autogan								
TOTAL	123	100			65	100		

Mostly small barangay traders utilized receiving rooms for storage.

Source: Trader Interviews

APPENDIX 21

NUMBER OF SOLAR DYERS OWNED BY TYPE OF TRADERS IN RMA SITES

LOCATION	TYPE OF TRADERS								
	Barangay (n=25)			Municipal (n=36)			Provincial (n=7)		
	No. of Solar Dryer	%	Range of Capacity (sacks)	No. of Solar Dryer	%	Range of Capacity (sacks)	No. of Solar Dryer	%	Range of Capacity (sacks)
CLAVERIA Hinaplunan Ane-i	1	4	3						
MALAYBALAY Magsaysay Aglayan	2	8	10-12	3	8	40-400			
VALENCIA				2	6	100-400	1	14	100
MARAMAG				2	6	35-300			
DON CARLOS New Visayas Pualas	1	4	40	1	3	150	3	8	60-120
PANGANTUCAN							2	29	40-300
KALILANGAN Kibaning Lampanusan	1	4		5	14	30-450	2	29	40-150
WAO Milaya Katutungan				4	11	200-500	1	14	100
TOTAL	5	20		25	69		6	88	

Source: Trader Interviews

APPENDIX 22

MONTHLY AVERAGE WHOLESALE PRICES OF WHITE AND YELLOW CORN GRAINS
IN MALAYBALAY, BUKIDNON, 1984-88 & 1989

MONTH	1984-88		1989	
	WGN	YGN	WGN	YGN
			(P/Kg)	
JANUARY	2.78	2.66	3.71	3.11
FEBRUARY	3.05	2.77	3.89	3.23
MARCH	2.97	2.62	3.98	3.49
APRIL	3.06	2.72	4.34	4.19
MAY	3.07	2.74	4.06	3.77
JUNE	2.75	2.56	4.14	3.84
JULY	2.33	2.31	4.05	3.97
AUGUST	2.22	2.27	3.98	3.94
SEPTEMBER	2.43	2.30	4.57	4.12
OCTOBER	2.72	2.44	5.07	4.12
NOVEMBER	2.77	2.56	5.31	4.62
DECEMBER	2.89	2.76	4.41	4.60

Source: Trader Interviews

APPENDIX 23

MONTHLY AVERAGE PRICES OF WHITE AND YELLOW CORN GRAINS IN CAGAYAN DE ORO, 1984-1989

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(P/kg)												
WHITE CORN GRAINS												
1984	1.75	1.75	2.19	2.19	2.19	2.37	2.37	2.40	2.68	2.68	2.79	2.93
1985	3.15	3.06	3.24	3.60	3.42	2.80	2.34	2.16	2.16	2.16	2.20	2.34
1986	2.90	3.10	2.70	2.80	2.60	2.20	1.90	1.80	1.90	2.30	2.40	2.80
1987	2.97	3.15	3.15	3.70	3.85	3.57	3.55	3.10	3.60	2.20	2.60	2.80
1988	3.22	3.57	3.44	3.31	3.32	2.89	2.55	2.29	2.57	2.86	3.11	3.29
AVERAGE	2.80	2.93	2.94	3.12	3.08	2.77	2.54	2.35	2.58	2.44	2.62	2.83
1989	3.47	3.80	3.48	3.78	3.64	3.60	3.87	3.49	4.25	5.20	5.53	4.73
YELLOW CORN GRAINS												
1984	1.75	1.75	2.19	2.19	2.19	2.37	2.37	2.40	2.68	2.68	2.79	2.93
1985	3.15	3.06	3.24	3.60	3.42	2.79	2.34	2.16	2.16	2.16	2.07	2.07
1986	2.80	3.00	2.60	2.70	2.50	2.50	2.10	1.80	1.90	2.20	2.30	2.70
1987	3.10	3.17	3.17	3.50	3.60	3.65	3.65	3.20	2.60	2.40	2.70	3.00
1988	3.25	3.32	3.08	3.05	3.00	2.84	2.58	2.63	2.67	2.87	2.90	3.30
AVERAGE	2.81	2.86	2.86	3.01	2.94	2.83	2.61	2.44	2.40	2.46	2.55	2.80
1989	3.00	3.42	3.26	4.01	3.85	3.87	3.80	3.63	4.03	4.40	4.98	5.02

320

Source: Cagayan de Oro Trader/Shipper

APPENDIX 24

MONTHLY AVERAGE PRICES OF WHITE CORN GRAINS & GRITS
CAGAYAN DE ORO CITY, 1984-88 & 1989

	WGN 1984-88	WCT 1984-88	WGN 1989	WCT 1989
	(P-/Kg)			
JANUARY	2.75	4.29	3.20	5.40
FEBRUARY	2.89	4.49	3.60	6.00
MARCH	2.96	4.64	3.85	6.20
APRIL	3.16	4.81	4.10	6.60
MAY	3.13	4.77	4.10	6.62
JUNE	2.82	4.80	4.36	6.64
JULY	2.49	4.49	4.39	6.58
AUGUST	2.37	4.06	4.24	6.49
SEPTEMBER	2.58	4.00	4.82	6.90
OCTOBER	2.41	4.07	5.20	7.63
NOVEMBER	2.56	3.66	5.53	8.15
DECEMBER	2.77	4.50	4.73	8.05

Source: NFA, Cagayan de Oro City

APPENDIX 25

MONTHLY AVERAGE PRICES OF WHITE CORN GRAINS & GRITS
CEBU CITY, 1984-88 & 1989

MONTH	White Corn Grains		White Corn Grits	
	1984-88	1989	1984-88	1989
	(P/Kg)			
January	3.68	4.30	4.72	5.58
February	3.61	4.46	4.71	5.86
March	3.70	4.74	4.77	6.24
April	3.64	5.01	4.78	6.55
May	3.58	4.80	4.84	6.44
June	3.67	4.78	4.65	6.54
July	3.68	4.91	4.43	6.66
August	3.75	4.97	4.08	6.75
September	3.62	5.69	4.23	7.19
October	3.67	5.94	4.45	7.73
November	3.73	6.27	4.65	8.29
December	3.96	5.37	4.77	7.80

Source: NFA, Cebu City

APPENDIX 26

MONTHLY AVERAGE RETAIL PRICES OF REGULAR MILLED RICE (RMR)
AND WHITE CORN GRITS (WCT), CEBU CITY, 1984-88 & 1989

MONTH	1984-1988		1989	
	RMR	WCT	RMR	WCT
	(P/Kg)			
January	5.80	4.81	6.82	5.83
February	5.70	4.91	7.02	6.24
March	5.74	5.04	7.15	6.56
April	5.72	5.07	7.94	6.95
May	5.84	5.16	8.16	7.00
June	6.01	5.08	8.44	6.97
July	6.34	4.83	9.09	7.00
August	6.46	4.53	9.42	7.07
September	6.37	4.63	9.16	7.45
October	6.22	4.82	8.85	8.00
November	5.96	5.04	8.90	8.86
December	6.09	5.12	8.90	8.54

Source: NFA, Cebu City

APPENDIX 27

ILLUSTRATIVE CALENDAR OF ACTIVITIES AND CULTURAL PRACTICES
FOR GROWING HYBRID CORN

ACTIVITIES 1/	LABOR REQUIRED 2/	DBP/DAP 3/	STAGES OF GROWTH
STAGE I LAND PREPARATION			
1. Preparation of farm plan and budget, arrangements for financing and crop insurance		30 to 40 DBP	
2. First plowing: for newly opened area (usually during first cropping only 4/); or for cultivated area (for both first and second cropping)	5 to 6 MAD	30 DBP	
3. Liming of the field evenly	4 MD	20 DBP	
4. Procurement of inputs (seeds, fertilizers)		7 to 15 DBP	
5. First harrowing	2 MAD	13 DBP	
6. Second plowing	5 to 6 MAD	7 DBP	
7. Second harrowing	2 MAD	1 to 2 DBP	
STAGE II PLANTING			
1. Furrowing at 70 to 80 cms. apart per row and 12 to 15 deep per furrow	2 MAD		
2. Basal application of fertilizer, i.e., 4 to 6 bags complete fertilizer	2 MAD		
3. Planting of one seed per hill at 20 to 25 cms. apart within each furrow	8 MD		
STAGE III CARE AND MAINTENANCE			
1. Monitoring of insect infestation, i.e., seedling maggots and cutworm		5 to 6 DAP	Seed emergence stage
2. If insect infestation is present, spraying of chemical directly to seedling is recommended (about 1/2 litera per hectare)		6 to 8 DAP	Leaf stage
3. Off-harrowing or shallow cultivation (about 5 to 8 cms. deep)	2 MAD	12 to 15 DAP	4 to 5 leaves or early whorl stage
4. Row weeding and spot weeding		12 to 15 DAP	
5. First sidedressing of nitrogen fertilizer, i.e., 1 to 1.5 bag of urea or 2 to 3 bags of ammonium	2 MD	12 to 15 DAP	
6. Row weeding	12 MD	15 to 20 DAP	
7. Second sidedressing of nitrogen fertilizer, i.e., 1 to 1.5 bag of urea or 2 to 3 bags of ammonium (Or only sidedressing for farmers who do not split application of nitrogen, i.e., 2 to 3 bags urea or 4 to 6 bags of ammonium)	2 MD	25 to 30 DAP	6 to 7 leaves or mid-whorl stage
8. Hilling up to cover sidedressed fertilizer (at least 20 cms. away from the base of the plants to minimize root pruning)	2 to 3 MAD	35 to 40 DAP	Late whorl stage
9. If necessary, spraying of chemical for corn borer protection is recommended, i.e., about one liter per hectare	2 MD	35 to 40 DAP	
10. Continue monitoring of corn borer infestation spray if necessary		46 to 53 DAP	Tasseling stage
11. Monitor other corn plant pests, i.e., earworm, army worm and rats		46 to 54 DAP	Silking stage
		60 to 70 DAP	Blistering stage
STAGE IV HARVEST AND POST-HARVEST			
1. Harvesting of corn ears	12 MD	100 to 110 DAP	Maturity
2. Drying of harvested ears and storing in well-ventilated bins before shelling		100 to 110 DAP	
3. Shelling corn ears	6 MD 5/	101 to 111	
4. Drying of grains to reduce moisture content up to 14% before selling or storage	6 MD 6/	102 to 112	
			Bagging of dried corn grain, piling of bags

1/ Activities are based on a farm size of one hectare.

2/ MD - man day; MAD - man-animal day

3/ DBP - days before planting; DAP - days after planting

4/ Cultivation of newly opened areas for corn is preferred during the first cropping season which permits more adequate time for land preparation, i.e., two months, than the second cropping season which allows only one month for land preparation.

5/ Labor required if given favorable weather condition and access to available shelling and drying facilities, i.e., shelling and drying could be immediately done at most one day after harvest.

6/ Drying requires a maximum of two days given favorable weather condition.

Source. Interviews of sample farmers in the municipalities of Claveria, Malaybalay, Don Carlos, Kalingan, Wao, and recommendations from hybrid seed companies.

APPENDIX 28

COMPARATIVE COST OF LABOR IN SAMPLE BARANGAYS,
FIRST CROPPING SEASON, 1989 1/

MUNICIPALITY/ BARANGAYS	MAN-DAY (MD) 2/		MAN-ANIMAL DAY (MAD)	
	W/Meals	W/O Meals	W/Meals	W/O Meals
	----- (P/day) -----			
CLAVERIA				
Hinaplanan	25	30	50	60
Ane-i		25-30		50-60
MALAYBALAY				
Magsaysay		30		60
Aglayan		25-35		50-60
DON CARLOS				
New Visayas		25		50
Pualas		35		70
KALILANGAN				
Kibaning	30	35	60	70
Lampanusan	30	35	60	70
WAO				
Milaya	20	30	50	60
Katutungan		30-35		60-70

1/ Cost of labor refers to hired person and/or animal for corn farming which covers land preparation, planting, care and maintenance, and harvest and post harvest activities.

2/ Meals include breakfast and lunch.

Source: Interviews of 40 farmers.

APPENDIX 29 Comparative Costs of Production Per Hectare of Yellow Hybrid and White Corn Farmers in The Sample Barangays, First Cropping Season, 1989 1/

A. Farmers in Claveria and Malaybalay 2/

MUNICIPALITY	CLAVERIA								
	HINAPLANAN				ANEI				
	YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN		
VARIETY USED	FL	HL	FL	HL	FL	HL	FL	HL	
ITEMS FOR ANALYSIS	FL	HL	FL	HL	FL	HL	FL	HL	
A. LABOR COSTS 3/									
1. Land Preparation									
Plowing	0	690	180	545	125	725	0	833	
Harrowing	60	60	55	25	188	230	0	83	
Farrowing	0	150	0	110	38	112	0	126	
2. Liming	0	30	0	0	0	38	0	0	
3. Planting	0	225	0	90	0	162	0	112	
4. Cultivation									
Off-barring	0	180	50	60	75	175	0	50	
Hilling-up	0	120	50	60	38	138	0	186	
5. Fertilization									
Basal	0	30	0	30	0	62	0	12	
1st Sidedressing	0	30	0	30	0	38	0	12	
2nd Sidedressing	0	0	0	0	0	0	0	8	
6. Weeding									
1st Weeding	0	150	0	0	0	0	30	80	
2nd Weeding	0	0	0	0	0	0	0	0	
7. Pest and Disease Control	0	0	0	0	0	0	0	0	
Sub-total	60	1,655	335	950	464	1,700	30	1,549	
B. MATERIAL COSTS									
1. Seeds	0	635	0	40	0	850	0	40	
2. Fertilizers	0	1,586	0	380	0	2,085	0	308	
3. Pesticides	0	0	0	0	0	0	0	0	
4. Lime	0	265	0	0	0	260	0	0	
Sub-total	0	2,486	0	420	0	3,195	0	348	
C. PRE-MARKETING COST									
1. Harvesting	0	639	0	791	0	1,009	0	979	
2. Shelling	0	117	0	70	0	280	0	16	
3. Drying	0	109	0	75	0	56	0	0	
4. Hauling	0	110	0	0	0	0	0	0	
Sub-total	0	975	0	936	0	1,345	0	1,155	
D. OTHER COSTS									
1. Animal Rental	0	0	0	0	0	0	0	574	
2. Landlord Share	0	0	0	0	0	0	0	0	
3. Land Rental	0	0	0	0	0	0	0	0	
Sub-total	0	0	0	0	0	0	0	574	
TOTAL PRODUCTION COST (Labor, Material, Pre-Marketing, Others)	60	5,126	335	2,306	464	6,240	30	3,526	
E. MARKETING COST 5/									
1. Transportation	0	0	0	16	0	0	0	0	
Total	0	0	0	16	0	0	0	0	
TOTAL COST (For FL and HL)	60	5,126	335	2,322	464	6,240	30	3,526	
		5,188		2,657		6,704		3,526	

1/ Based on actual costs, i.e., these include imputed costs for family labor.

2/ Two white corn and two yellow hybrid corn farmers were interviewed per barangay.

3/ Labor costs include Family Labor (FL) and Hired Labor (HL). Costs of hired labor in selected sites are shown in Appendix 28.

4/ Tractor was used for land preparation.

5/ No transportation cost means corn was picked-up in the farm.

APPENDIX 29A continued ...

MUNICIPALITY	MALAYBALAY							
	MAGSAYSAY				AGLAYAN			
BARANGAY	YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
VARIETY USED	FL	HL	FL	HL	FL	HL	FL	HL
ITEMS FOR ANALYSIS	FL	HL	FL	HL	FL	HL	FL	HL
A. LABOR COSTS								
1. Land Preparation								
Plowing	431	279	708	0	0	0	0	0
Harrowing	0	0	69	210	0	700 4/	400	430 4/
Farrowing	61	26	72	36	30	130	90	60
2. Liming	45	60	0	0	50	88	52	70
3. Planting	0	105	45	69	38	100	62	52
4. Cultivation								
Off-barring	61	45	120	72	60	160	60	120
Hilling-up	61	51	130	72	60	110	60	120
5. Fertilization								
Basal	90	30	0	0	12	25	18	18
1st Sidedressing	0	75	0	0	25	25	0	52
2nd Sidedressing	0							52
6. Weeding								
1st Weeding	0	345	0	216	0	350	237	200
2nd Weeding	0	0	0	0	0	0	0	175
7. Pest and Disease Control								
Control	0	0	0	0	12	0	0	0
Sub-total	735	1,016	1,144	675	257	1,718	979	1,359
B. MATERIAL COSTS								
1. Seeds	0	894	0	43	0	865	0	42
2. Fertilizers	0	1,167	0	0	0	2,318	0	1,680
3. Pesticides	0	0	0	0	0	120	0	0
4. Lime	0	800	0	0	0	740	0	1,275
Sub-total	0	2,661	0	43	0	4,043	0	2,997
C. PRE-MARKETING COST								
1. Harvesting	0	1,369	0	769	0	2,995	0	475
2. Shelling	0	209	0	225	0	362	0	171
3. Drying	0	488	0	26	0	91	0	37
4. Hauling	0	112	0	82	0	0	0	29
Sub-total	0	2,178	0	1,102	0	3,448	0	712
D. OTHER COSTS								
1. Animal Rental	0	0	0	0	0	0	0	0
2. Landlord Share	0	0	0	0	0	0	0	0
3. Land Rental	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0
TOTAL PRODUCTION COST (Labor, Material, Pre-Marketing, Others)	735	6,055	1,144	1,820	257	9,209	979	5,078
E. MARKETING COST								
1. Transportation	0	122	0	80	0	733	0	286
Total	735	6,177	1,144	1,900	257	9,942	979	5,364
TOTAL COST (For FL and HL)		6,912		3,014		10,219		6,343

APPENDIX 29 Comparative Costs of Production Per Hectare of Yellow Hybrid and White Corn Farmers In The Sample Barangays, First Cropping Season, 1989

B. Farmers in Don Carlos and Kalilangan^{1/}

MUNICIPALITY	DON CARLOS							
BARANGAY	NEW VISAYAS				PUALAS			
VARIETY USED	YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
ITEMS FOR ANALYSIS	FL	HL	FL	HL	FL	HL	FL	HL
A. LABOR COSTS 2/								
1. Land Preparation								
Plowing	0	725	330	0	280	810	225	610
Harrowing	0	0	100	0	245	0	25	60
Farrowing	25	100	88	0	154	0	25	60
2. Liming	0	0	0	0	0	0	0	0
3. Planting	0	96	81	0	108	36	0	120
4. Cultivation								
Off-barring	25	100	125	0	273	0	25	95
Hilling-up	25	175	175	0	210	0	0	105
5. Fertilization								
Basal	0	49	12	0	89	0	25	45
1st Sidedressing	12	50	25	0	89	0	0	58
2nd Sidedressing	0	0	0	0	0	0	0	0
6. Weeding								
1st Weeding	0	188	438	0	315	240	45	405
2nd Weeding	0	0	100	0	0	0	0	150
7. Pest and Disease Control	0	0	0	0	0	0	0	0
Sub-total	87	1,483	1,494	0	1,761	1,086	370	1,708
B. MATERIAL COSTS								
1. Seeds	0	600	0	40	0	365	0	59
2. Fertilizers	0	1,339	0	248	0	1,529	0	1,428
3. Pesticides	0	0	0	0	0	0	0	0
4. Lime	0	0	0	0	0	0	0	0
Sub-total	0	1,939	0	288	0	1,894	0	1,487
C. PRE-MARKETING COST								
1. Harvesting	0	752	0	539	0	889	0	968
2. Shelling	0	99	0	128	0	150	0	56
3. Drying	0	50	0	64	0	85	0	130
4. Hauling	0	248	0	349	0	0	0	208
Sub-total	0	1,149	0	1,080	0	1,124	0	1,362
D. OTHER COSTS								
1. Animal Rental	0	0	0	0	0	0	0	0
2. Landlord Share	0	0	0	0	0	0	0	0
3. Land Rental	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0
TOTAL PRODUCTION COST (Labor, Material, Pre-Marketing, Others)	87	4,571	1,494	1,368	1,761	4,104	370	4,557
E. MARKETING COST 3/								
1. Transportation	0	0	0	0	0	0	0	112
Total	87	4,571	1,494	1,368	1,761	4,104	370	4,669
TOTAL COST (For FL and HL)		4,658		2,862		5,865		5,039

1/ Two white corn and two yellow hybrid corn farmers were interviewed per barangay.

2/ Labor costs include Family Labor (FL) and Hired Labor (HL). Costs of hired labor in selected sites are shown in Appendix 28.

3/ No transportation cost means corn was picked-up in the farm.

APPENDIX 29B continued . . .

MUNICIPALITY	KALILANGAN							
BARANGAY	KIBANING				LAMPANUSAN			
VARIETY USED	YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
ITEMS FOR ANALYSIS	FL	HL	FL	HL	FL	HL	FL	HL
A. LABOR COSTS								
1. Land Preparation								
Plowing	320	0	470	350	90	420	280	280
Harrowing	30	0	150	0	78	250	280	0
Farrowing	30	100	115	35	45	75	99	29
2. Liming	0	0	0	0	0	0	0	0
3. Planting		130	0	130	0	120	35	88
4. Cultivation								
Off-harrowing	125	105	265	0	150	60	175	0
Hilling-up	30	135	265	0	60	60	140	0
5. Fertilization								
Basal	0	74	0	30	0	30	18	30
1st Sidedressing	0	89	0	75	0	105	88	0
2nd Sidedressing	0	89	0	85	0	60	88	0
6. Weeding								
1st Weeding	60	0	0	105	0	270	175	150
2nd Weeding	0	0	0	105	0	0	0	0
7. Pest and Disease Control	0	0	0	0	30	0	22	0
Sub-total	590	722	1,265	915	453	1,450	1,380	877
B. MATERIAL COSTS								
1. Seeds	0	830	0	37	0	908	0	390
2. Fertilizers	0	3,222	0	1,706	0	3,931	0	1,622
3. Pesticides	0	0	0	30	0	62	0	40
4. Lime	0	0	0	0	0	0	0	0
Sub-total	0	4,052	0	1,773	0	4,901	0	2,042
C. PRE-MARKETING COST								
1. Harvesting	0	1,284	0	737	0	1,484	0	1,824
2. Shelling	0	304	0	100	0	153	0	180
3. Drying	0	115	0	42	0	73	0	40
4. Hauling	0	1,309	0	388	0	89	0	222
Sub-total	0	2,992	0	1,265	0	1,829	0	2,266
D. OTHER COSTS								
1. Animal Rental	0	0	0	0	0	0	0	0
2. Landlord Share	0	0	0	0	0	0	0	0
3. Land Rental	0	400	0	0	0	0	0	0
Sub-total	0	400	0	0	0	0	0	0
TOTAL PRODUCTION COST (Labor, Material, Pre-Marketing, Others)	590	8,166	1,265	3,953	453	8,180	1,380	4,885
E. MARKETING COST								
1. Transportation	0	2,836	0	0	0	1,430	0	450
Total	590	10,852	1,265	3,953	453	9,610	1,380	5,335
TOTAL COST (For FL and HL)		11,452		5,213		10,063		6,715

1/

c. Farmers in Wao and Average for the 5 Municipalities Covered ^{2/}

MUNICIPALITY	W A O								AVERAGE FOR THE 5 MUNICIPALITIES COVERED			
	MILAYA				KATUTUNGAN				YELLOW CORN		WHITE CORN	
BARANGAY	YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN		YELLOW CORN		WHITE CORN	
VARIETY USED	FL	HL	FL	HL	FL	HL	FL	HL	FL	HL	FL	HL
ITEMS FOR ANALYSIS	FL	HL	FL	HL	FL	HL	FL	HL	FL	HL	FL	HL
A. LABOR COSTS 3/												
1. Land Preparation												
Plowing	525	225	300	300	165	450	180	300	193	432	275	322
Harrowing	210	0	80	0	30	70	30	0	84	133	117	81
Farrowing	175	0	80	60	65	82	30	80	62	78	58	61
2. Liming	0	0	0	0	0	0	0	0	10	22	5	7
3. Planting	0	195	47	60	0	300	25	115	14	147	30	84
4. Cultivation												
Off-barring	175	0	70	60	82	160	90	50	102	99	98	61
Hilling-up	35	80	0	130	30	142	0	110	55	101	82	79
5. Fertilization												
Basal	15	30	0	24	0	100	0	32	21	43	7	22
1st Sidedressing	15	30	24	35	0	130	0	65	14	67	14	33
2nd Sidedressing	15	30	0	0	0	112	0	40	2	28	9	23
6. Weeding												
1st Weeding	0	479	82	300	0	499	38	225	38	255	105	169
2nd Weeding	0	0	0	0	0	0	0	0	0	0	10	43
7. Pest and Disease Control												
Control	0	0	0	0	0	0	0	0	4	0	2	0
Sub-total	1,165	1,069	723	969	372	2,045	393	1,020	597	1,395	811	973
B. MATERIAL COSTS												
1. Seeds	0	529	0	55	0	828	0	44	0	700	0	78
2. Fertilizers	0	2,814	0	1,350	0	2,767	0	1,839	0	2,276	0	1,044
3. Pesticides	0	0	0	0	0	0	0	0	0	15	0	7
4. Lime	0	0	0	0	0	0	0	0	0	307	0	128
Sub-total	0	3,343	0	1,435	0	3,595	0	1,883	0	3,231	0	1,262
C. PRE-MARKETING COST												
1. Harvesting	0	522	0	934	0	1,274	0	1,411	0	1,220	0	943
2. Shelling	0	186	0	121	0	412	0	218	0	200	0	146
3. Drying	0	54	28	45	0	417	0	82	0	157	3	54
4. Hauling	0	0	0	71	0	709	0	254	0	258	0	160
Sub-total	0	792	28	1,171	0	2,812	0	1,965	0	1,864	3	1,322
D. OTHER COSTS												
1. Animal Rental	0	0	0	0	0	0	0	0	0	0	0	56
2. Landlord Share	0	0	0	0	0	0	0	0	0	0	0	0
3. Land Rental	0	0	0	0	0	0	0	0	0	40	0	0
Sub-total	0	0	0	0	0	0	0	0	0	40	0	56
TOTAL PRODUCTION COST (Labor, Material, Pre-Marketing, Others)	1,165	5,204	751	3,575	372	8,452	393	4,868	597	6,531	814	3,594
E. MARKETING COST 4/												
1. Transportation	0	1,014	0	705	0	1,414	0	1,547	0	743	0	320
Total	1,165	6,218	751	4,281	372	9,866	393	6,415	597	7,274	814	3,913
TOTAL COST (For FL and HL)		7,383		5,002		10,238		6,808		7,871		4,727

1/ Two white corn and two yellow hybrid corn farmers were interviewed per barangay.

2/ Average cost of production for 20 white corn and 20 yellow hybrid corn farmers in the five municipalities covered.

3/ Labor costs include Family Labor (FL) and Hired Labor (HL). Costs of hired labor in selected sites are shown in Appendix 28

4/ No transportation cost means corn was picked up in the farm.

Source: Farmer Interviews

c. Registered Corn and Rice Warehouses
in Bukidnon, by Municipality

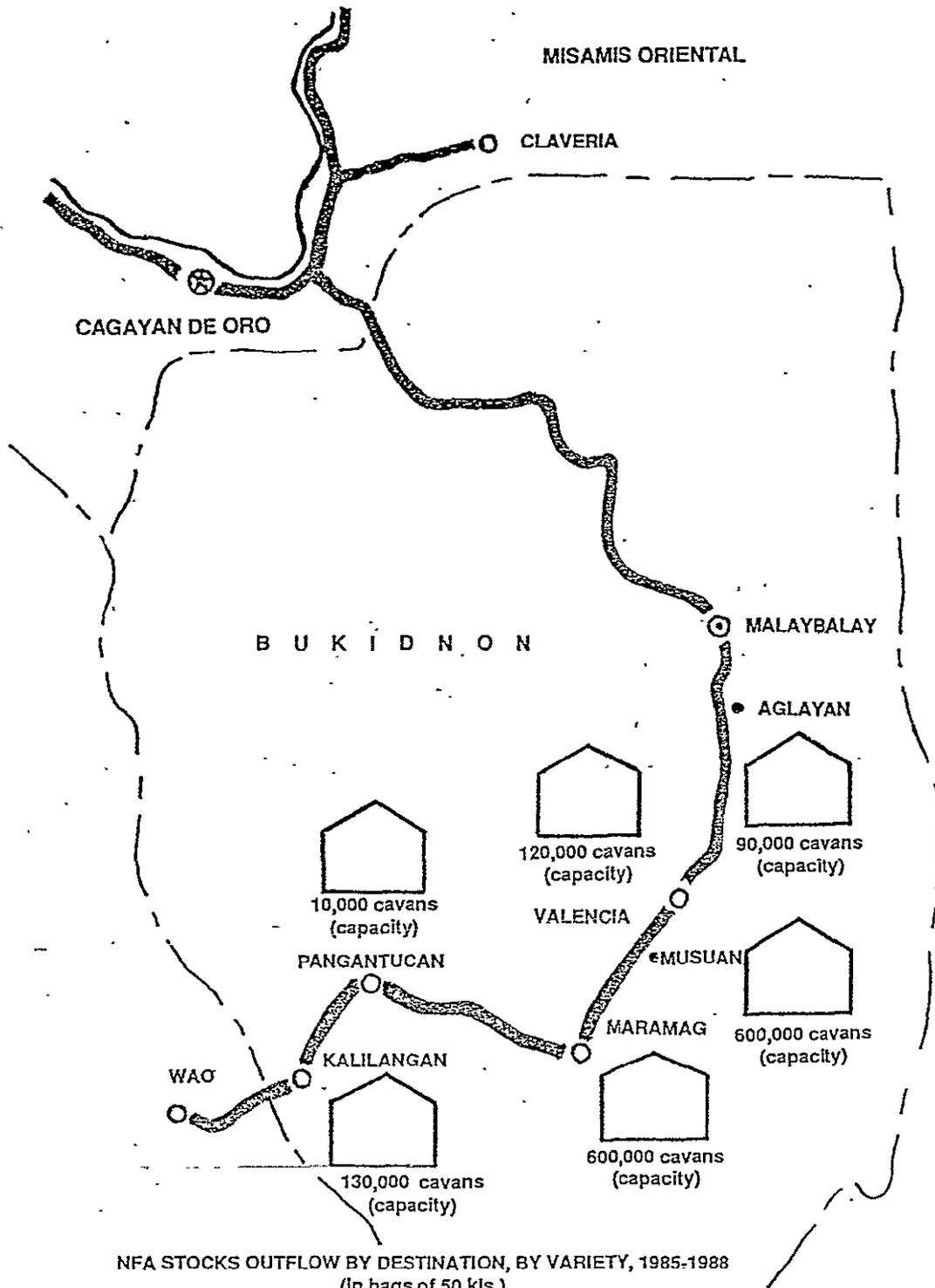
Municipality	Number	Capacity (No. of bags) 1/
Cabanglasan	2	400
Damulog	1	235
Dangcagan	6	5,000
Don Carlos	8	126,900
Impasug-ong	3	8,500
Kadingilan	3	1,000
Kalilangan	5	500
Kibawe	3	
Lantapan	1	
Malaybalay	18	1,031,883
Maramag	9	5,300
Pangantucan	1	
Quezon	11	2,810
San Fernando	3	100
Sumilao	1	1,000
Valencia	39	116,693
TOTAL 2/	114	1,300,321

1/ 50 kilos per bag

2/ No data was given for the municipalities of
Baungon, Kitaotao, Libona, Malitbog, Manolo
Fortich, Pangantucan and Talakag. Also no data
was available for Wao and Claveria.

Source: Bukidnon Statistical Yearbook, 1989
(NFA - Provincial Office Dat

APPENDIX 31
LOCATION MAP OF NFA WAREHOUSES & BUYING STATIONS



Destination/Variety	1985	1986	1987	1988
Cagayan de Oro				
White Corn Grains	70,073	218,560	165,309	26,842
Yellow Corn Grains	9,847	53,633	120,911	211,338

Source: NFA Provincial Office, Bukidnon

APPENDIX 32

a. NATIONAL INSTITUTIONS AFFECTING THE CORN INDUSTRY AND THEIR FUNCTIONS

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
I. GOVERNMENT							
A. Dept. Agencies							
1. DA (Dept of Agriculture)	Overall: Promote agricultural development in order to increase farmers' income, ensure food security and attain self-sufficiency in (rice & corn)	<ul style="list-style-type: none"> Prevent over exploitation of resources to ensure their long term productivity Protect health and safety of the populace Prevent & contain spread of plant and animal diseases Prevent manipulation in the market of staple agri-commodities and inputs Protect domestic agri-producers from unfair competition of imports made cheap through subsidies by exporting countries Ensure quality of Phil. agri. exports and increase their share in world market 	Lead, in support of private sector efforts, the dev't., production and distribution of superior crop varieties	<ul style="list-style-type: none"> Conduct empowerment programs through farmers training on cooperatives Develop and strengthen extension services to farmers 	Assist agri-entrepreneurs avail of financing through credit guarantee and insurance facilities	<ul style="list-style-type: none"> Provide market information for policy and planning purposes Provide info on agri-business investment opportunities 	Facilitate market access and promotion of agri-based industries through post harvest and marketing support facilities

b. NATIONAL INSTITUTIONS AFFECTING THE CORN INDUSTRY AND THEIR FUNCTIONS

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
Specific Bureaus and Agencies under the DA	<p>NFA (National Food Authority):</p> <ul style="list-style-type: none"> Stabilize price and supply of corn by maintaining farm support price and keeping buffer stocks <p>NAFC (National Agricultural & Fishery Council):</p> <ul style="list-style-type: none"> Promote private sector participation in agricultural dev't programs and policy-making procedures 	<p>NFA:</p> <ul style="list-style-type: none"> Develop grades and standards for grains Issue business license to corn millers and grain traders <p>Authorize and allocate corn importation</p> <p>BPI (Bureau of Plant Industry):</p> <ul style="list-style-type: none"> Enforce plant quarantine procedures <p>FPA (Fertilizer & Pesticide Authority):</p> <ul style="list-style-type: none"> Ensure adequate supply of fertilizer and pesticides at reasonable prices Protect the public from risks of fertilizers & pesticides <p>ACPC (Agricultural Credit Policy Council):</p> <ul style="list-style-type: none"> Promulgate and develop guidelines on agricultural credit <p>BAI (Bureau of Animal Industry):</p> <ul style="list-style-type: none"> Registers feedmilling companies Enforce animal quarantine procedures <p>NMIC (National Meat Inspection Commission):</p> <ul style="list-style-type: none"> Conduct meat inspection for local and imported sources Enforce standards for accreditation of slaughterhouses 	<p>BPI:</p> <ul style="list-style-type: none"> Develop crop production technology Develop seed production & storage technology <p>BS (Bureau of Soils):</p> <ul style="list-style-type: none"> Develop and conduct soil analysis <p>Conduct crop diversification studies</p> <p>BAR (Bureau of Agricultural Research):</p> <ul style="list-style-type: none"> Coordinate and integrate all agri-research, liaise with PCAARD <p>FPA:</p> <ul style="list-style-type: none"> Research on pesticide use with DFI <p>NAPHIRE (National Post-Harvest Institute for Research & Extension):</p> <ul style="list-style-type: none"> Develop and promote grains post-harvest technologies <p>BAI:</p> <ul style="list-style-type: none"> Introduce improved livestock breeds Promote animal health and nutrition <p>NMIC:</p> <ul style="list-style-type: none"> Research on animal-borne diseases Research on sanitary disposal of animal slaughter wastes 	<p>BPI:</p> <ul style="list-style-type: none"> Promote integrated pest management for corn <p>ATI (Agricultural Training Institute):</p> <ul style="list-style-type: none"> Develop and conduct training on programs for trainers/extension workers <p>NAPHIRE:</p> <ul style="list-style-type: none"> Conduct training on post-harvest technologies <p>BACOD (Bureau of Agricultural Cooperatives & Development):</p> <ul style="list-style-type: none"> Support farmers organizations by intensifying pre- and post-organizational education, managers training, monitoring and audit services 	<p>QGF (Quezon Guarantee Fund Board):</p> <ul style="list-style-type: none"> Provide credit guarantee for grain traders <p>PCIC (Philippine Crop Insurance Corporation):</p> <ul style="list-style-type: none"> Ensure corn farmers' crops against losses due to infestation and adverse weather condition 	<p>NFA:</p> <ul style="list-style-type: none"> Publish monthly and quarterly market information on grains <p>BAS:</p> <ul style="list-style-type: none"> Collect and disseminate agricultural statistics for policy makers and other uses Conduct market research studies 	<p>NFA:</p> <ul style="list-style-type: none"> Provide warehouses <p>BAI:</p> <ul style="list-style-type: none"> Establish Artificial Insemination Centers

C. NATIONAL INSTITUTIONS AFFECTING THE CORN INDUSTRY AND THEIR FUNCTIONS

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
2. DARR (Dept of Agrarian Reform)	Promote rural economic growth and equity through a comprehensive agrarian reform program	Promulgate guidelines for land acquisition, land transfer and compensation for landowners	Develop system for land mapping, and resource surveys				
3. DOST (Dept of Science and Technology)	Advance science and technology for economic and health uses		Conduct R & D of processing, energy & biotechnology				
4. DTI (Dept of Trade and Industry)	Expand trade and industry to improve the country's economy	Promulgate guidelines on investments and trade	Conduct research on industry technologies in cooperation with private sector	Develop and conduct training on cottage, small and medium enterprises	Assist entrepreneurs to avail of financing	Conduct review of trade & investment trends	Establish industrial and export processing centers
5. DENR (Dept of Environment & Natural Resources)	Protect use of environmental and natural resources to enhance ecological balance	Promulgate conservation laws on land & forestry resources	Develop technologies for conservation and optimum utilization of environmental and natural resources				
6. DPWH (Dept of Public Works and Highways)	Provide efficient public works to promote public safety and convenience & to spur economic activities	Issue guidelines on public works which include roads, ports, bridges & drainage					Construct, rehabilitate & maintain roads, ports, bridges & drainage facilities
7. DOTC (Dept of Transportation and Communication)	Provide efficient transportation and communications system to promote economic growth	Issue guidelines on public and private transportation and communications system					Install public transportation and communication facilities
8. NEDA (Nat'l Economic Development Authority (NEDA))	Provide overall socio-economic development policies and directions for the nation Develop policy studies on macro-economic and sectoral concerns Coordinate and integrate government and private sector efforts towards socio-economic development	Promulgate the medium & long term plan for the Philippines Issue guidelines on official development assistance				Publish medium & long term socio-economic development plan for the Philippines Publish national census statistics on demographic data	

d. NATIONAL INSTITUTIONS AFFECTING THE CORN INDUSTRY AND THEIR FUNCTIONS

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
B. Financing Agencies							
1. DBP (Development Bank of the Philippines)	Promote wholesale banking and intensify development of domestic capital market				Channel medium and long-term funds to participating financial institutions for on-lending to investment enterprises		
2. LBP (Land Bank of the Philippines)	Support the agrarian reform program by managing its financial operations				Extend production credit to farmer cooperatives esp. rice and corn		
3. GFSME (Guarantee Fund for Small & Medium Enterprises)					Guarantee loans to small and medium enterprises		
C. Research and Academic Institutions							
PCARRD (Phil. Council for Agricultural Resources & Research Development)			Review and evaluate R & D programs and projects being implemented by the National Agriculture and Resources Research and Development Network (NARRDN)			Publish studies on various R & D topics	
SCUs (State Colleges & Universities)			Conduct technology research on production, post harvest, processing and marketing				

e. NATIONAL INSTITUTIONS AFFECTING THE CORN INDUSTRY AND THEIR FUNCTIONS

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
II. Private Organisations							
1 PCCI (Phil Chamber of Commerce and Industry)	Promote industrial growth and development Officially represent the private sector's positions on national issues				Serve as conduit of IGLF (Industrial Guarantee & Loan Fund)	Collect and publish market research data	
2. CONFED (Confederation of Rice & Corn Millers Association)	Promote the (rice and) corn milling industry nationwide through close consultations among members and with various groups, esp. gov't policy makers						
3. PAFMII, (Phil Association of Feed Millers, Inc.)	Promote the feedmilling industry nationwide through close consultations among members & with various groups, esp. gov't. policy makers						
4. PAHRI (Phil Association of Hog Raisers, Inc.), USPA (United Swine Producers Assn), PPAI (Phil Poultry Industry Assn), PLDPF (Phil Livestock & Poultry Development Foundation)	Promote the livestock and poultry industries through close consultations among members & with various groups, esp. gov't. policy makers						

f. NATIONAL INSTITUTIONS AFFECTING THE CORN INDUSTRY AND THEIR FUNCTIONS

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION
B. Research and Management Organizations						
1. CRC (Center for Research and Communication)	Promote socio-economic development through applied research		Develop & conduct applied research methodologies	Conduct training workshops on various areas geared towards development		Conduct market and policy oriented research and publish research outputs
2. TLRC (Technology & Livelihood Resource Center)			Develop technologies for income-generating enterprises	Conduct training on livelihood enterprises	Extend financing programs for livelihood enterprise	Publish technologies on livelihood projects
3. AMMDA (Agricultural Machines Manufacturing & Distribution Asso.) PIS (Phil Inventors Society) APPROTECH (Appropriate Technology Center)			Develop technologies for agri-based machineries & equipment	Encourage commercialization of agri. machinery technologies through farm demonstration and pilot tests		
4. MAP (Management Asso. of the Philippines)	Enhance private sector participation in technology and management services development		Promote technology & management research & development	Conduct training & consultancy services on various development areas		
C. Financing Sources						
Various commercial and development banks					Extend credit for agri-based enterprises	

APPENDIX 33

TOTAL CORN PROCUREMENT OF
THE NATIONAL FOOD AUTHORITY, 1987-1989

	1987	1988	1989
	(MT)		
January	1,176	241	4
February	87	114	5
March	78	60	
April	4	573	
May	5	188	
June	4	3,341	
July	5	12,350	
August	3,619	59,589	
September	11,057	36,300	
October	7,996	8,813	
November	2,138	612	
December	782	100	
TOTAL	26,951	122,281	9

Source: NFA

APPENDIX 34

NFA REQUIREMENTS FOR LICENSING BUSINESS
ESTABLISHMENTS IN GRAINS

I.A. Establishment/Facilities for LICENSING:

1. Retailing
2. Wholesaling
3. Processing
4. Bakeries
5. Milling
6. Warehousing
7. Indenting
8. Packaging
9. Importing
10. Exporting

B. General Requirements for Licensing (New Applicants) 2 copies each

1. FOR INDIVIDUAL

- 1.1. Pass-port size pictures
- 1.2. Income Tax Returns for the last 3 years
- 1.3. Financial Statement for the last 3-years certified by a CPA if capitalization is P 25,000 or more.

2. FOR CORPORATION/ENTITIES - 2 copies each

- 2.1. Pass-port size pictures of the authorized representative;
- 2.2. Board resolution authorizing the representative to sign for and in behalf of its corporation;
- 2.3. Articles of Incorporation
- 2.4. Constitution and By-Laws
- 2.5. Registration Certificate with the Securities and Exchange Commission (SEC)
- 2.6. Income Tax Returns of the Corporation for the last three (3) years Certified by a CPA if capitalization is P 25,000 or more.

3. Signboard

C. Additional Requirements and Facilities/Equipment Required For Licensing (New Applicants)

1. Retailing

- a. Duly calibrated scale or weighing apparatus;
- b. Adequate storage space;
- c. Grains box duly painted white;
- d. Price tags on rice, corn and/or other grains and/or their substitutes and their by-products/and products displayed for sale.

Wholesaling:

- a. Duly calibrated platform scale or suitable weighing apparatus;
- b. Adequate storage facility owned or leased for the grains to be traded;
- c. Price list of grains displayed on a conspicuous place in the establishment of the business and;
- d. Duly calibrated moisture meter for wholesalers of palay.

Milling:

- a. Locational clearance form Housing and Land Use Regulatory Board for all types of mills except single pass rice and corn mill;
- b. Clearance from National Pollution Control Commission for all types of mills except single pass rice and corn mill;
- c. Postcard size picture of the mill and of the building housing mill;
- d. Location plan indicating the principal roads bounding the site of the mill;
- e. Warehouse plan indicating therein the material used, floor area, height, storage space or capacity and the space occupied by the mill or other facilities;
- f. List of equipment, facilities and their respective capacities such as scale, moisture tester, fire extinguisher, etc.;
- g. Schedule of charges for milling;
- h. Bond insurance if bonded mill;
- *i. Duly calibrated platform scale or suitable weighing apparatus;
- *j. Fire extinguisher;
- *k. Adequate space for the grains received for milling;
- *l. Duly calibrated moisture tester.

- Not required for traveling kiskisan or grinders.

Shelling:

- a. Postcard size picture of the sheller and of the building housing the sheller;
- b. List of equipment, facilities and their respective capacities such as scales, moisture tester, fire extinguisher, etc.
- c. Schedule of charges for shelling;
- d. Bond and insurance if to be bonded.

Threshing:

- a. Schedule of Charges duly certified by the owner thereof.

Warehousing:

- a. Postcard size picture of the warehouse;
- b. Location plan indicating the principal roads bounding the site of the warehouse;
- c. Warehouse plan indicating therein the materials used, floor area, height, storage space or capacity or the space occupied by the mill or other facilities/equipment, if any. If warehouse is to be bonded, warehouse plan shall be duly certified by a registered Engineer/Architect and shall indicate the portion applied for bonded storage, if not to be completely bonded.
- d. List of equipment, facilities and their respective capacities such as scales, moisture tester, fire extinguisher, etc.;
- e. Schedules of charges for storage;
- f. Bond and insurance if warehouse is to be bonded;
- g. Duly calibrated platform scale or suitable weighing scale or apparatus;
- h. Duly calibrated moisture meter;

- i. Drier
- j. Fire extinguisher/s
- k. Fumigating and pest control equipment;
- l. Pallets
- m. Warehouse should be rodent and bird proof and properly ventilated.

7. Bakery/Bakeshop/Pastry shop/Food processor/Manufacturer:

- a. Information sheet of all bakers/baking technician employed by the applicant for license;
- b. Two (2) passport size picture of bakers/baking technician/Food technician concerned;
- c. Oven;
- **d. Dough kneader; 10 kilos capacity and/or planetary vertical mixer with 5 quarts capacity;
- *e. Working table;
- *f. Proofing cabinet;
- *g. Cooking wax;
- *h. Weighing scale;
- *i. Wooden trough or plastic container with cover;
- *j. Adequate working space or area;
- *k. Baking sheet and pans.

* Required for bakery operators only

** Suspended temporarily-effective 13-January 1984

II.A. Establishment/Facilities for Registration (New Applicant)

- 1. Motor vehicles used in transporting grains
- 2. Mechanical drier;
- 3. Grains warehouse for storing own produce;
- 4. Threshing for threshing own produce;
- 5. Sheller for shelling own produce;
- 6. Grains packaging plant for exclusive use;
- *7. Mills and other facilities/equipment not in operation;
- 8. Institution/establishments such as but not limited to restaurant, hotel/motels, hospitals, can teen/ eateries,dormitories, seminaries, charitable institutions, penitentiaries, rehabilitation center, like youth welfare and orphanages and other industrial/commercial buying grains for the use or consumption of the employées or customers;
- 9. Manufacturer, importers, dealers and distributors of post-production equipment;
- 10. Poultry and hog raising securing grains from NFA.

* Registration shall be done only once:

B. Requirements for Registration:

- 1. Three (3) passport size pictures of the applicant-of the duly authorized representative in case of entities;
- 2. For transporting facilities;
 - a. LTC registration certificate;
 - b. Official Receipt for payment of LTC registration.
- 3. For manufacturers, importers, dealers, and distributor of post-production equipment;
 - a. Copies of brochures containing specifications of the equipment manufactured/imported;
 - b. Pictures of the post-production equipment.

III. Requirements for Renewal of License:

1. Passport size picture of the applicant;
2. Income tax return for the previous year;
3. Financial Statement for the previous year.

IV. Special Franchised Bonded Warehouse to Participate in Quedan Financing Program:

A. Requirements:

1. All requirements for bonded warehousing per R & R enumerated in NO.1, C6, hereof;
2. License for bonded warehousing;
3. Sign board measuring at least 75 cm in width and 135 cm in length bearing applicants name or business name, address, license number and certificate of franchise number.

V. Procedure in Securing a License/Registration

1. Secure application form from the Registration and Licensing Officer (RLO) upon payment of application fee;
(5 minutes)
2. Prepare the facilities/equipment requirements for inspection by NFA investigators (Inspection schedule is within 1 week)
3. After inspection of establishment, submit the application form with complete requirements to the Registration and Licensing Officer for processing
(Processing time : 10 to 20 minutes)
4. Pay license fee to the NFA cashier; (5 minutes)
5. Present Official Receipt to RLO for issuance of license/temporary permit valid for 60 days -
(10 to 20 minutes)

Note: See RLO for signboard specifications

VI. Procedures for Renewal of License/Registration:

1. Secure application form from the Registration and Licensing Officer (RLO) upon payment of application fee; (5 minutes)
2. Submit the application form with complete requirements together with the NFA license for the previous year to the RLO for processing; (Processing time: 5 to 10 minutes)
3. Pay license fee to the NFA cashier; (5 minutes)
4. Present Official Receipt to the RLO for validation of your license/registration certificate.(5 to 10 minutes)

VII. In pilot areas for Billing System in 1988, following shall be the Procedure in Securing Renewal of License/Registration

1. Present the bill/renewal notice together with the requirement and the NFA license for the previous year to the Registration Licensing Officer for processing; (processing time: 3 to 5 minutes)
2. Sign the computerized renewal application, and pay the amount of fees stated therein to the NFA cashier; (5 minutes)
3. Present the OR to the RLO for validation of your licenses/registration certificate; (5 to 10 minutes)

Source: National Food Authority, Region X

Appendix 35

a. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL)
AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
REGIONAL LEVEL							
1. GOVERNMENT							
A. Department Agencies							
1. DA (Dept of Agriculture) - Regional Office	Overall: Implements agricultural programs and projects in line with the DA's objectives		Conduct corn farm trials	Deploy agricultural technicians	Implement LEAD (Livelihood Enhancement for Agricultural Development) Program	Conduct market studies	Provide solar dryers through LEAD dryers
Specific Bureaus and Agencies under the DA - Region X	NFA (National Food Authority): Procure corn at gov't support prices RAFC (Regional Agricultural and Fishery Council): Encourage people's participation in agr. dev't through sectoral representation in agri policy-making bodies	NFA: Enforce standards for grains License grain millers, traders and their port Conduct seed certification FPA (Fertilizer & Pesticide Authority): Monitor supply and price levels of fertilizers and pesticides License input dealers	BS (Bureau of Soils): Conduct land capability studies Conduct fertilizer assay and lime analysis Produce soil inoculants for leguminous plants Conduct compost and trichogramma tests for organic fertilizer	BPI (Bureau of Plant Industry): Implement crop protection program BS: Conduct soil sampling analysis			NFA: Provide warehouses
2. Other Department Agencies	Implement programs and projects in consonance with their central offices' functional objectives						

**b. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL)
AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO**

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
B. Financing Agencies							
a. LBP (Land Bank of the Phil), PNB (Phil National Bank), DDP (Development Bank of the Phil)					Provide agricultural financing		
C. Research & Academic Institutions							
a. XU (Xavier University)			Conduct research on agriculture, anthropology, native/tribal groups & reforestation				
b. DMMMPSC (Don Mariano Marcos Memorial Polytechnic State College)				Offer courses on vocational and academic curricula			
II. PRIVATE							
A. Business Organization							
a. Oro Chamber (Cagayan de Oro Chamber of Commerce and Industry Foundation, Inc.)	Promote and protect private sector initiative in business activities located in Cagayan de Oro and Misam Oriental		Conduct corn marketing assessment study in Region 10 under the AAPP (Accelerated Agricultural Production Project)		Provide access to credit facilities	Conduct training and advisory services	
	Serves as an affiliate member of the PCCI (Phil Chamber of Commerce & Industry)						
b. Oro Grains	Promote grains industry in the region through close consultation among members and with various groups, esp. gov't. policy-makers						

**c. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL)
AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO**

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
B. Research SEARSOLIN (Southeast Asia Rural Social Leadership Institute)				Link up with the Xavier University on agricultural and leadership training			
III. Development NGOs							
a. MUCARD (Muslim-Christian Agency for Rural Development)	Promote agricultural development in the rural areas			Assists in organizing groups for rural development	Provide small scale credit		
b. Tawit Foundation				Organize farmers into self-help organizations assists farmers in marketing their crops	Help farmers obtain agricultural financing		
c. Hagdanan sa Pag-uswag Foundation				Promote small-scale entrepreneurship development	Provide small-scale loans to entrepreneurs		
d. PHILDHARRA (Phil Partnership for the Development of Human Resources in Rural Areas)	Promote coordination and cooperation among NGOs directly involved in social development among depressed communities			Enhance growth professionalization of development NGOs		Act as clearing house in facilitating the exchange of information, resources, experiences and expertise among NGOs primary groups and development workers Promote research, documentation and reflection on various dev't issues	
e. Others PICCO (First Community Credit Cooperative)				Conduct training on credit cooperatives	Provide credit financing, Mutual Aid Fund & small economic assistance		

**d. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL)
AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO**

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
Provincial Municipal Level							
MISAMIS ORIENTAL CLAVERIA							
I. GOVERNMENT							
a. DA, PAO (Provincial Agricultural Officer) & MAO (Municipal Agricultural Officer) Offices			Monitor corn production through DA technicians industrial crops	Assist of cooperatives/ transformation of Samahang Nayon Farmers' As into cooperatives Implementing Integrated Pest Management Progra	Assist in extending crop insurance to corn farmers	Conduct market studies	Support establishment of solar dryers and storage facilities
PAFC (Provincial Agricultural and Fishery Council) & MAFC (Municipal Agricultural & Fishery Council)	Promote agricultural production and development through greater private participation						
b. Other Gov't Agencies DAH (Dept of Agrarian Reform) DPWH (Dept of Public Works & Highways)	Implement programs and projects in consonance with their central offices functional objectives						

e. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL)
AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
B. Financing Agencies							
a. Claveria Rural Bank					Provide credit to farmers organization		
C. Research & Academic Institutions							
a. MOSCAT (Misamis Oriental State College of Agriculture and Technology)			Conduct fertilizer trials	Conducted LEAD supported project of DA on corn and tomato production through technology transfer to United Farmers of Claveria, Inc. (UFCI)			
d. IIRR (International Rice Research Institute) Claveria			Monitoring daily rainfall data Conduct a feed substitute study using winged bean				
II. PRIVATE							
a. SIMCA (San Isidro Multi-Purpose Cooperative of Ana-I)				Promote hybrid seeds to member farmers	Help farmers to avail credit/loan from financing institution	Facilitate marketing of farmers' produce	Propose a solar dryer
BUKIDNON							
A. Department Agencies							
a. DA - PAO and MAO Offices			Conduct demonstration and exploratory research Implement IPD promotion strategies such as seed exchange program		Provide assistance to farmers in availing of formal credit		Establishment of solar dryer and other post-harvest facilities through LEAD program

f. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION
FAPC & MAFC	Promote agricultural production and development through greater private sector participation			Conduct farmers' class/lectures		
BAS (Bureau of Agricultural Statistics)	Service statistical data requirements of the DA Provide statistical needs of the farmers, fishermen and all other agri-dependent sectors of society					Monitoring prices of agricultural crops and disseminate price information
NFA		Provide additional incentives to farmer groups who sold corn to them.				
PCIC (Phil Crop Insurance Corporation)	Provide insurance plan to protect corn farmers against crop losses caused by natural calamities, i.e., floods, earthquakes, typhoons, droughts, etc.	Require both borrowing farmers are required to follow the package of technology recommended by DA and must agree to be supervised by a production technician accredited by DA		Train unemployed agriculture graduates/students as adjusters	Provide farmers with guarantee coverage (all-risk & multi risks) Enhance farmers credit standing enabling them to borrow again for the next cropping season	
b. Other Gov't Agencies	Implement plans & programs in consonance with their central agencies' functional objectives					
b. Financing Agencies						
a. LDP	Improve farmers' organizations' access to corn production and post-harvest loans	Farmers could avail of production loan provided their crop are insured on PCIC	Promotion of hybrid seeds		Extend production loan to corn growers Had provided 1 coop in 1968 and 9 coops in 1969 Extending Agricultural Loans to corn traders Extending credit to corn farmers and traders in Kallangan	

**g. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL)
AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO**

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION
b RPB (Republic Planters Bank)					Extend production loan to corn traders	
c. KRB (Kallangan Rural Bank)					Extend credit to corn farmers and traders in Kallangan	
C. Research and Academic Institutions						
a. CMU (Central Mindanao University)			Undertake/conduct several types of research on corn Providing soil sample analysis			Involved in information dissemination that would benefit the farmers through their radio station, DXMU
NOMCARRD I/ (Northern Mindanao Consortium for Agricultural Research and Resource Development)	Promote agricultural research and development in Northern Mindanao					
II. PRIVATE						
A. Business Organization						
Valencia Chamber of Commerce and Industry	Promote business progress and development					
c. Kallangan Farmers' Cooperative					Extending credit to farmers in terms of inputs	
d. Plantation Consumer's Cooperatives, Inc.	Agricultural development		Conduct/provide farmers' class(es) regarding hybrid corn technology & soil preservation			

**h. LOCAL INSTITUTIONS (REGIONAL, PROVINCIAL, MUNICIPAL)
AFFECTING THE CORN INDUSTRY IN NORTHERN MINDANAO**

	POLICY FORMULATION AND ADVOCACY	REGULATION	TECHNOLOGY R & D	TRAINING AND EXTENSION	CREDIT AND GUARANTEE	MARKET INFO RESEARCH AND DISSEMINATION	INFRASTRUCTURE SUPPORT
WAO ----- I. GOVERNMENT A. Department Agencies ----- a. DA			Assist the technical aspects of corn production	Monitor of corn production Conduct farmer's class			Support the establishment of drying and storage facilities
B. Other Gov't Agencies ----- DAR, NFA, etc.	Implement programs and projects in consonance with their central offices' functional objectives						
II. PRIVATE A. Business Organization ----- a. Wso Grains Association						Assist in the marketing of farmers' produce	Propose to establish a multi-purpose pavement to be used for drying corn during harvest season
b. Tawill Foundation			Promote alternative and sustainable agricultural technology	Organize small farmers Promote cooperative development, i.e. producer/credit coop formation, cluster organization and cooperative marketing	Seek financial assistance for farm production	Assist farmers market their crops	

APPENDIX 36

LAND BANK OF THE PHILIPPINES
CHECKLIST OF REQUIREMENTS FOR CROP LOAN APPLICATION

Name of Coop: _____ Contact Person: _____

Address: _____ Project: _____

Initial Requirements

- _____ 1. (5) Application Form to be notarized
- _____ 2. (1) Residence Certificate of authorize officer(s)
- _____ 3. (1) Certificate of Registration (authenticated xerox copy)
- _____ 4. Certificate of Good Standing
- _____ 5. Copy of Articles of Incorporation & By-Laws together with all amendments
- _____ 6. List of Board of Members/Management Officers with their corresponding signatures and addresses together with their Certificate of Incumbency indicating therein their terms of office (the same shall be supported with biodata which shall highlight the qualifications and experience of the Board members/management officers)
- _____ 7. Board Resolution authorizing certain management officer to negotiate/contract business with LBP
- _____ 8. Licenses/Business Permits from agencies concerned if necessary (authenticated xerox copy)
- _____ 9. Financial Statements (Balance Sheet, Income Statement and Cash Flow Statement for the last 3 years duly certified by any CPA)
- _____ 10. Project Proposal/Farm Plan & Budget/Feasibility Study

Post Approval Documents

- _____ 11. Collateral (if EP or TCT with latest Tax Declaration and Tax Receipt)
- _____ 12. Certificate of Insurance Coverage & Assignment of Insurance Policy
- _____ 13. REM/CM duly notarized & registered
- _____ 14. Accountable Officers for the Coop are properly bonded
- _____ 15. Certification that Book of Account are properly installed and Accountants and Bookkeeper are trained.
- _____ 16. Certification that Coop management is capable to retail loans and administer funds and document transaction
- _____ 17. Certification that ORs, PNs and other necessary forms are available in the coop.
- _____ 18. Endorsement to LBP of individual members' PN to Coop
- _____ 19. Other requirements

Source: Land Bank of the Philippines, Malaybalay Field Office,
Malaybalay, Bukidnon

APPENDIX 37

PROBLEMS PERCEIVED BY HYBRID YELLOW CORN VS. WHITE CORN FARMERS
BY BARANGAY FIRST CROPPING SEASON, 1989

a. Farmers in Claveria, Malaybalay and Don Carlos

LOCATION and TYPE / PROBLEMS	CLAVERIA				MALAYBALAY				DON CARLOS			
	Hinaplanan		ANE-I		Magsaysay		Aglayan		New Visayas		Pualas	
	WC (n=5)	YC (n=5)	WC (n=5)	YC (n=5)	WC (n=10)	YC (n=3)	WC (n=6)	YC (n=8)	WC (n=8)	YC (n=6)	WC (n=7)	YC (n=7)
	(%)											
Post Harvest Facilities	40	40	40	20	20	67	33	34	38	67	28	57
Transport Related	40	20	40	40	40	33	-	12	50	83	28	43
Lack of Capital	80	60	60	60	90	-	33	62	83	83	43	28
Fluctuating / Low Prices	0	20	40	-	50	33	17	38	100	100	57	43
Weeds / Pest / Diseases	40	60	-	20	-	100	-	25	12	50	28	43
High Cost of Inputs	40	40	20	-	10	-	-	12	25	33	57	57
High Cost of Labor	0	20	20	40	10	33	33	38	-	17	57	-
Unpredictable Weather Condition	0	-	20	20	10	33	17	50	12	-	-	-
No / Lack of Working Animals	0	-	40	-	30	-	-	-	-	-	28	-

b. Farmers in Kalilangan and Wao

LOCATION and TYPE / PROBLEMS	KALILANGAN				WAO				TOTAL		GRAND TOTAL	
	Kibaring		Lampunan		Milaya		Katutungan		WC	YC	N-115	100%
	WC (n=6)	YC (n=4)	WC (n=5)	YC (n=5)	WC (n=5)	YC (n=5)	WC (n=5)	YC (n=5)	(n=62)	(n=53)		
	(%)											
Post Harvest Facilities	33	75	80	100	80	80	80	100	44	62	60	52
Transport Related	67	50	100	60	60	20	40	100	45	45	62	45
Lack of Capital	17	25	20	40	60	20	60	-	58	42	58	50
Fluctuating / Low Prices	50	75	40	20	60	40	80	20	51	40	53	46
Weeds / Pest / Diseases	-	-	60	60	20	40	-	40	14	42	31	27
High Cost of Inputs	33	25	40	40	20	40	60	20	27	30	33	29
High Cost of Labor	17	-	-	20	20	40	40	60	19	25	25	22
Unpredictable Weather Condition	17	-	20	20	20	-	-	-	6	13	14	12
No / Lack of Working Animals	17	-	40	20	20	20	60	40	22	008	18	16

Note: YC = Yellow Corn and WC = White Corn
The total may not equal to 100% due to multiple responses.

Source: Farmer Interviews

APPENDIX 38

PROBLEMS PERCEIVED BY TYPE OF TRADERS AND LOCATION
IN MISAMIS ORIENTAL, BUKIDNON & WAO, LANA O DEL SUR, 1989

a. Barangay/Municipal/Provincial Traders

PROBLEMS	TYPE OF TRADER			TOTAL
	BARANGAY	MUNICIPAL	PROVINCIAL	
	n=25	n=36	n=7	N=68
	%	%	%	%
1. Poor roads/bridges condition	20	25	71	28
2. Lack of working capital	28	22	43	27
3. Price fluctuation	32	19	29	25
4. Low credit recovery	24	19	14	21
5. Wet corn	12	22	29	19
6. Low supply of corn	16	22	14	19

b. Traders by Location

PROBLEMS	LOCATION			TOTAL
	CLAVERIA	MALAYBALAY	KALILANGAN	
	n=9	n=37	n=22	N=68
	%	%	%	%
1. Poor roads/bridges condition	11	11	64	28
2. Lack of working capital	33	24	23	26
3. Price fluctuation	56	22	18	25
4. Low recovery of credit	11	30	9	20
5. Wet corn	11	14	32	19
6. Low supply of corn	56	19	5	19

Source: Trader interviews

APPENDIX 39

PROBLEMS PERCEIVED BY TRADER/SHIPPERS
IN CAGAYAN DE ORO, 1989

PROBLEMS	(N=7)
	%
1. Limited bottoms	43
2. Substantial shortage of corn grains purchased	29
3. High moisture content of corn	29
4. Inadequate working capital	29
5. Tight competition among traders	29
6. Price fluctuations	14
7. Pilferage at Cebu Port	14

Source: Trader/shipper interviews

APPENDIX 40

PROBLEMS PERCEIVED BY TRADERS/SHIPPERS AND COMMERCIAL
CORN MILLERS IN CEBU CITY, 1989

a. Traders

PROBLEMS	N=10
	%
1. Inadequate bottoms from CDO, South Cotabato and Davao	70
2. High moisture content of corn from CDO	40
3. Reduced corn grain supply from CDO	40
4. Price fluctuations	20

b. Commercial Corn Millers

PROBLEMS	N=7
	%
1. Inadequate supply of white corn	71
2. High moisture content of corn	71
3. Lack of bottoms	57
4. Unannounced brown-outs/power failures	29

Source: Trader/shipper and commercial corn miller interviews

APPENDIX 41

PROBLEMS PERCEIVED BY CUSTOM & COMMERCIAL CORN MILLERS
IN REGION X (NORTHERN MINDANAO), 1989

a. Custom Corn Millers

PROBLEMS	(N=24)
	%
1. Low milling recovery	75
2. High moisture content of corn	13
3. Inadequate working capital	8

b. Commercial Corn Millers

PROBLEMS	(N=5)
	%
1. Inadequate supply of white corn	60
2. High moisture content of corn	60
3. Lack of bottoms	20
4. Poor condition of roads and bridges	20

Source: Custom and commercial corn miller interviews

APPENDIX 42

PROBLEMS PERCEIVED BY SAMPLE FEEDMILLERS IN CAGAYAN DE ORO & CEBU, 1989

a. Cagayan de Oro

PROBLEMS	(N=2)
	%
1. Poor condition of roads and bridges	100
2. Inadequate supply of yellow corn	100
3. Rising cost of feed ingredients	50

b. Cebu

PROBLEMS	(N=2)
	%
1. High moisture content of corn coming from CDO	100
2. Rising cost of feed ingredients	50
3. Inadequate supply of yellow corn	50

Source: Feedmiller interviews

APPENDIX 43

PROBLEMS PERCEIVED BY SAMPLE BACKYARD & COMMERCIAL
HOG RAISERS IN NORTHERN MINDANAO, 1989

a. Backyard Hog Raisers

PROBLEMS	N=10
	%
1. Incidence of epidemics	100
2. Low marketing during summer	66
3. Inflow of native hogs from a neighboring region	66
4. Inconsistency on feed quality	33

b. Commercial Hog Raisers

PROBLEMS	N=5
	%
1. Lack of breeding stocks available in Region X	71
2. High percentage of losses during hog shipment	57
3. High cost of feed ingredients	57
4. Inadequate hog vans Manila shipment and absence of hog vans Cebu shipment	29
5. Inadequate working capital	29

Source: Backyard and commercial hog raiser interviews

APPENDIX 44

PROBLEMS PERCEIVED BY SAMPLE BACKYARD & COMMERCIAL
HOG RAISERS IN CEBU, 1989

a. Backyard Hog Raisers

PROBLEMS	N=4
	%
1. Incidence of epidemics	75
2. Inadequate working capital	50

b. Commercial Hog Raisers

PROBLEMS	N=6
	%
1. High cost of production	67
2. Inadequate supply of corn from Mindanao	50
3. Incidence of epidemics	33

Source: Backyard and commercial hog raiser interviews

APPENDIX 45

PROBLEMS PERCEIVED BY SAMPLE POULTRY GROWERS
IN NORTHERN MINDANAO & CEBU, 1989

a. Northern Mindanao

PROBLEMS	N=10
	%
1. Inadequate Supply of day old chick	70
2. Inconsistency on feed quality	40
3. Incidence of epidemics	40
4. Inadequate working capital	40
5. Price competition for poultry eggs with Cebu suppliers	30

b. Cebu

PROBLEMS	N=5
	%
1. Inadequate supply of corn from Mindanao	60
2. High cost of production	40
3. Incidence of epidemics	40

Source : Poultry growers interviews

APPENDIX 46

PROJECTED CASH FLOW
100 SOW LEVEL
(Monthly Estimates)

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total	
I. INVESTMENT COST																				
A. Land (one hectare)	10,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,000	
B. Gestating House (6.6 m x 34 m) @ P1,800/sq m	403,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	403,920	
C. Farrowing House (24 crates @ P10,000/crate)	0	0	0	0	0	0	240,000	0	0	0	0	0	0	0	0	0	0	0	240,000	
D. Nursery House (6.2 m x 24 m) @ P2,500/sq m	0	0	0	0	0	0	0	312,000	0	0	0	0	0	0	0	0	0	0	312,000	
E. Growing House (8.2 m x 69 m) @ P1,250/sq m	0	0	0	0	0	0	0	0	604,750	0	0	0	0	0	0	0	0	0	604,750	
F. Water System (Pump, reservoir, pipes, waterers)	50,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,000	
G. Feedmill/Bodega	150,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150,000	
H. Quarters/Office	60,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60,000	
Total	673,920	0	0	0	0	0	240,000	312,000	604,750	0	0	0	0	0	0	0	0	0	1,830,670	
INCOME																				
133 heads/month @ 86 kgs @ P29.00/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	331,702	331,702	331,702	996,106
II. OPERATING BUDGET																				
A. Purchase of Breeders																				
1. Boars - 5 heads @ P9,000/head	0	0	0	45,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45,000
2. Gilts - 100 heads @ P4,500/head	0	0	0	450,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	450,000
	0	0	0	495,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	495,000
B. Feeds																				
1. Before production (from purchase to breeding)																				
a. Gilts (100 heads)	0	0	0	154,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	154,200
b. Boars (5 heads)	0	0	0	2,572	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,572
2. Production - Cost of Feeds																				
a. Sows (100) and Boars (5)	0	0	0	0	0	117,992	0	0	0	0	0	9,833	19,665	29,498	39,331	39,331	39,331	39,331	294,980	
b. Growers (16 heads/sow/year)	0	0	0	0	0	589,010	0	0	0	0	0	49,159	98,318	147,478	196,637	196,637	196,637	196,637	1,474,775	
C. Labor (7 men @ P2,500/month)	0	0	0	0	0	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	210,000
D. Veterinary Medicine	0	0	0	1,000	1,000	1,000	4,667	4,667	4,667	4,667	4,667	4,667	4,667	4,667	4,667	4,667	4,667	4,667	4,667	59,000
E. Electricity	500	500	500	800	800	800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	25,500
F. Other Express (Trucking, Supplies, Misc.)	0	0	0	1,000	1,000	1,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	39,000
Total	500	500	500	654,572	2,800	2,800	734,889	26,967	26,967	26,967	26,967	26,967	86,064	144,960	200,942	202,934	202,934	202,934	202,934	2,755,027

COMMON TERMS USED IN THE CORN COMMODITY SYSTEM
IN NORTHERN MINDANAO

A glossary of commonly used terms in the corn commodity system and their appropriate local expressions are provided below. Definitions of local expressions are given whenever a single expression signifies more than one thing or idea.

Farm Level

- Basket - "Bukag/Bakat" - a container utilized in measuring harvesters' share on sharing, usually made of rattan.
- Cart - "Karomata/Kariton" - a two - wheeled carabao drawn cart.
- Cattle - "Baka" - draft animal trained for plowing.
- Charge to - "Pahulam/Pautang" - borrowed cash or inputs for production, payment will be done after Crop harvest.
- Clay Soil - "Bagtikan/Taloon" - fine textured soil, poor in aeration and drainage, sticky when wet and hard to plow when dry.
- Corn - "Mais" - Zea Maize L. - a cereal plant with tall stalks bearing kernel on ears.
- Corn (ear) - "Tipuso/Puso" - a) a grain bearing spike of a corn plant; or b) fruiting head of a corn, including both the kernels of grain and protective as well as supportive structures.
- Corn Cob - "Pakaw/Anongal" - the core or center part of an ear of corn, i.e., part remaining after recovering the corn grain.
- Corn Crib - "Lolo" - storage house for corn, flooring are usually made of bamboo slats.
- Corn (dried) - "Uga nga mais" - moisture content of the corn grain is between 14% and 16%.
- Corn Field - "Kamaisan/Maisan" - a parcel of land planted with corn.
- Corn Grain - "Lugas sa mais/Uyas sang mais" - small hard seed of corn use for feeds, etc., botanically known as caryopsis, a dry or seeded berry in which the fruit coat and seed coat

refused to form a single grain.

- Corn (green) - "Tilaubon/Anagon" - corn harvested before the full maturity. Can be utilized for human consumption.
- Corn (half-dried) - "Basa-basa nga mais" - moisture content of corn grain is usually between 14% and 16%.
- Corn (shelled) - "Linubo/Padpad" - a) (noun) corn grains removed from the cob or; b) (verb) to shell.
- Corn (wet) - "Basa nga mais" - moisture content of corn grain is usually over 19%.
- Cropping Cycle - "Kutsitsa" - farmers cropping activities on the farm from planting up to harvest.
- Cropping Season (1st) - "Panuig" - First planting season normally starts on April and May.
- Cropping Season (2nd) - "Tibuklas/Buklas" - second planting season normally starts on August and September.
- Cropping Season (3rd) - "Pamulahaw" - last planting season of the year, usually starts on January.
- Drought - "Hulaw" - non-occurrence of precipitation over a period of time.
- Dry (to) - "Bulad" - corn is dried by spreading the shelled grains on whatever hard surface is available, i.e., roads, basketball courts, drying floors, etc., during sunny days soon after harvest.
- Dryer - "Bulāranan" - a space for drying corn (solar or mechanical).
- Fertilizer - "Abono" - organic or inorganic material applied to enrich the soil.
- Furrow - "Tudling/ldas" - a narrow groove made in the ground by a plow.
- Grain - "Lusuk/Lugas, Uyas" - a small hard seed of any cereal plant.
- Harrow - "Rastilyos/Paragos/Karas" - a heavy frame with spikes or disk used for breaking up and leveling plowed ground.

- Harvest (to) - "Langgi/Sanggi" - to gather a season's crop.
- Harvest time - "Tingsanggi/Panahon sa sanggi" - time of the year when grain, fruit, etc., are gathered.
- Harvester - "Mananggiay/Tig-sanggi" - refers to a person harvesting corn.
- Harvester's Share - "Bahin/Sinangian" - share given by the farmer to a person for harvesting corn, 9:1 common ratio in sharing.
- Haul - "Hakot" - to move or transport from one point to another.
- Hilling-up - "Surko/Sira" - cultivation done 35-40 days after planting, it covers sidedressed fertilizer to the base of the corn plant.
- Horse - "Kabayo" - draft animal used for transporting corn in remote farms not accessible by vehicles.
- Husk - "Pakpak/Panit" - the outer covering of an ear of corn.
- Load - "Karga" - a quantity that can be customarily carried.
- Loam-soil - "Pughay" - a well pulverized and aerated soil rich in organic matter, suited for growing corn.
- Market Day - "Tienda/Tabo" - a stated time and place for people to come together for the purpose of holding sales.
- Measuring Unit - "Taksanan/Pangtakos" - a common container for measuring volumes of grain. This can be approximately 13-14 kilograms of dried corn grain.
- Moldboard Plow - "Daro" - a locally made farm implement, drawn by draft animal for plowing.
- Off-Season Planting - "Dili tingtanum" - corn planted outside the regular planting season.
- Off-Barring - "Abri" - first cultivation done 12-15 days after planting using moldboard plow.

- Pest - "Dangan/Peste" - insects that causes damages on corn production.
- Picking - "Ipo/Langgi/Sanggi" - to pick the ear of corn from the stalk.
- Plant (to) - "Pugas/Tanom/Panggas" - to put seeds into the furrow to grow.
- Price - "Presyo" - the amount of money asked or paid for something.
- Regular Exchange Partner - "Suki" - a person with whom a regular commercial relationship has evolved.
- Replanting - "Puli/Puna" - Replant seeds that did not germinate.
- Redeem - "Lucat" - Sharing system between farmer and hired laborer, usually in cash, fixed by a certain amount per kilogram of corn harvested to enable the farmer to acquire all the harvested corn.
- Sack - "Sako" a container made of plastic, jute, or similar materials used to hold various kinds of commodities, such as corn, palay, etc. This container usually holds 50 to 60 kilograms.
- Sell (to) - "Baligya" - a) to exchange goods or services for money; or b) to give up property to another for money or other valuable.
- Sheller (manual) - "Bangguran" - a hand tool made of wood and metal used in separating the kernel from the cob.
- Side Dressing - "Abono" - placing fertilizer in the soil near the roots of a growing crop.
- Sled - "Balsa/Kangga" - a box-like attachment usually made of bamboo that moves on by sliding on a pair of wooden runners, hitched to a carabao and used for hauling purposes.
- Spraying - "Magbomba" - farmers activities in the farm, using a sprayer and chemicals when their corn plants were already attacked by pests and diseases.
- Unload - "Diskarga" - to take the load out of a vehicle.

Weeding - "Magguna/Magbasok/Hilamon" - removing unwanted plants by hand or bolos.

Yield - "Abot" - farmer's produce after harvest.

Distribution Level

Advance - "Bale" - money or its equivalent paid for goods to be delivered at a later specified time.

Agent - "Ahente" - one who buys and sell on a commission basis on behalf of someone else.

Assembler - "Buy and Sell" - usually a small or medium-scale commodity buyer of rice, corn etc., who mostly procures from one municipality and sell in the cash market or with prior agreements.

Boat - "Barko/Bapor" - shipping vessel for transporting stocks of corn from port to port.

Canvasser - "Canvasser" - one who receives commission to conduct surveys of highest buying price among traders in behalf of his clients prior to selling.

Deduction - "Disuento" - a reduction either in volume or price charged by the buyer to the seller of corn when sold wet, half dried and or with impurities.

Drying Floor - "Bularanan/Buladan" - cemented areas near warehouses or basketball courts, asphalt roads, various mats, etc., on which corn is spread and dried in the sun.

Fare - "Plete/Pasahe" - the price charged to transport a person or thing.

Guarantor - "Piyansador" - a) one who gives a guarantee; or b) a person entrusted with the money that is to be extended to others (farmers).

Interest Rate - "Porsiyento" - the price paid for borrowing money generally expressed as a percentage of the amount borrowed usually paid in one month or one year.

Jeepney - "Jeepney/Dyip" - small vehicle designed to carry over 17-23 persons or 1.5 to 2.5 tons of commodities; common means of transportation to barangay.

Store - "Sari-Sari/Tindahan" - a small store with limited quantities of consumer goods for local consumers.

- Town - "Poblacion" - a capital town in a municipality.
- Barangay Trader - "Mamalitay" - small to medium scale commodity buyer (i.e., corn, copra, rice) who procures from the farmers in the barangay usually in per kg basis. Often had sari-sari store.
- Trader-Provincial level - "Mamalitay" - medium or large scale commodity buyer (i.e., rice copra and/or corn) who usually procures from more than municipalities within a province and the cash market in a contract basis.
- Trader (regional level) - "Mamalitay" - large scale commodity buyer who procure corn and or other commodities, i.e., copra from more than one province and sells the bulk of these commodities to other regions.
- Warehouse - "Bodega" - a building or room for storing dried corn.
- Weighing - "Timbangan/Bascula/Espada" - an instrument used to measure the weight of a certain thing such as corn, palay, copra, etc. (usually in kilogram unit).

Processing Level

- Corn (cracked) - "Ginaling nga mais/Giniling nga mais" - larger sized pieces of corn after milling.
- Corn Grits - "Kalimbugas/Bugas mais" - moderately sized pieces of corn after milling with various grades i.e., numbers 10, 12, 14, 16, 18, 22.
- Corn (fine) - "Tik-Tik" - very fine particles of corn after milling.
- Corn Bran - "Tahop" - by products of corn after milling utilized by backyard hog raisers for feeding.
- Feeds - "Pambahog/Bahog" - grains and other materials as food for livestock.
- Feedmill - "Fedmil" - processing of corn for feed manufacturing commercially or for own consumption.
- Feed Supply Store - "Agricultural Supply Store" - a business establishment that sells feeds and veterinary supplies for poultry, hog and other livestock.

Mill (corn) - "Galingan" - a) a place with a machine for grinding corn ; or b) to break grain into fine pieces.

Consumption Level

Hog Raiser - "Gabuhi ug Baboy" - a farmer who grow hogs.

Piggery - "Babuyan" - a place where hogs are raised commercially.

Poultry - "Manukan" - domestic fowls collectively.

Poultry Raiser - "Gabuhi ug Manok" - a farmer who raises domestic fowls.