

6. 各地におけるコメの価格（調査時期：2009年8～9月）

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1. マプト市

1.1 マプト市の Shoprite（スーパーマーケット）

商品名	内容（表示）	原産地	kg/袋	価格（MT）	輸入業者
Dona Ana	Long grain rice	袋詰はポルトガル	25	549	Dincore Lda. (Agrodinamica)
同上	同上	同上	10	299	同上
同上	同上	同上	5	179	同上
同上	同上	同上	1	32	同上
Mr. Dock	Long grain rice	同上	25	549	同上
Dona Ana Sun Rice	Thai Hon Mari Rice	タイ	5	259	同上
同上	同上	同上	1	52	同上
Tastic Basmati Aromatic Indian Rice		袋詰は南アフリカ共和国	1	55	Tastic
Tastic Bonnet Finest White Rice		同上	1	55	同上
Tastic Jasmine Fragrant Thai Rice		同上	2	139	同上
Sasseka First Choice White Rice		不明	5	159	Africom Lda.
同上		同上	1	29	同上
Ashoka Indian Basmati Rice		インド	5	369	Veetee Fine Foods Ltd. (India)
Dona Ana	Long grain parboiled rice	袋詰はポルトガル	5	185	Dincore Lda. (Agrodinamica)
同上	同上	同上	1	32	同上
Rite Brand	同上	袋詰は南アフリカ共和国	2	85	Fresta Holdings Ltd.
Suprise Rice	同上	不明	1	32	Tiger Consumer Brands Ltd.
同上	同上	同上	0.5	25	同上

1.2 マプト中央市場

商品名	内容（表示）	原産地	kg/袋	価格（MT）	輸入/精米業者
Xirico <Yellow>	（小分袋詰めのみ）	不明	1	25	Delta Trading
Sasseka	同上	不明	1	22	Africom Lda.
Dona Ana	Long grain rice		5	160	Dincore Lda.
同上	同上	同上	1	35	同上
Dona Ana Sun Rice	Thai Hon Mari Rice	タイ	5	260	同上
Super Kernel Basmati Rice	Extra long grain & aromatic	パキスタン	5	300	Delima Trading
Super Rice		パキスタン	5	300	Carimo & Filhos Lda.
Arroz Inteiro		表示なし	10	300	Comércio Internacional e Services Lda.
同上		表示なし	5	150	同上
Palmeira	Corrente（普通米）	Chókwè	5	120	Inácio de Sousa
同上	同上	同上	3	75	同上
同上	同上	同上	1	25	同上
同上	Integral（玄米）	同上	1	25	同上

2. マプト州

2.1 Palmeira の Inácio de Sousa (精米・製粉業者)

商品名	取引量	kg/袋	フォーマル価格 (MT)	インフォーマル価格 (MT)
Arroz Palmeira Extra (米)	最低 2 袋	50	898.50	943.50
	100 袋以上	50	880.00	
	最低 4 袋	25	470.00	493.50
	200 袋以上	25	461.50	
	最低 8 袋	12.5	250.50	
	400 袋以上	12.5	245.50	263.50
Arroz Palmeira Corrente (米)	最低 2 袋	50	684.00	718.50
	100 袋以上	50	666.00	699.50
	最低 4 袋	25	357.00	375.00
	200 袋以上	25	349.00	366.50
	最低 8 袋	12.5	191.00	201.00
	400 袋以上	12.5	186.00	195.50
Arroz Palmeira Trinca Grossa (コメ)	最低 2 袋	50	495.00	520.00
	最低 8 袋	12.5	138.00	145.00
Arroz Palmeira Trinca Fina (コメ)	最低 2 袋	50	440.00	462.00
	最低 8 袋	12.5	122.50	129.00
Extra Empactado (小袋)		1x10 パック	194.50	204.50
		3x6 パック	350.50	368.50
		5x4 パック	389.50	409.00
Integral Empactado		1x10 パック	194.50	204.50
Farinha de Arroz (コメ粉)		1x10 パック	179.50	188.50
Farinha de Milho Xima (シーマ用トウモロコシ粉)	最低 2 袋	50	457.00	480.00
	100 袋以上	50	449.50	
	最低 8 袋	12.5	123.00	124.50
	400 袋以上	12.5	119.50	
	最低 2 袋	2.5x6 パック	159.00	
	100 袋以上	2.5x6 パック	155.00	167.00
Farinha de Trigo Socimol Babita Especial (小麦粉)	最低 2 袋	50	851.50	894.50
	100 袋以上	50	846.00	
Farinha de Trigo Socimol Babita Normal (小麦粉)	最低 2 袋	50	820.00	861.00
	100 袋以上	50	814.50	
Semea de Arroz (コメ糠)	最低 5 袋	40	200.00	--
Casca de Arroz (もみ殻)	最低 30 袋	1	0.80	--
Semea de Trigo (小麦糠)	最低 20 袋	30	205.00	--
	最低 20 袋	25	195.00	--

注：「フォーマル価格」は業者への販売（卸売）価格、「インフォーマル価格」は個人への販売（小売）価格と思われる。

3. ガザ州

3.1 Pereira & Santos Chokwe 店（食品卸売業者）

商品名	内容（表示）	原産地	kg/袋	価格（MT）	輸入/精米業者
Sasseka “Coral” Blue	Long grain rice	不明（タイ？）	50	920	Africom Lda.
同上	同上	同上	25	465	同上
Sasseka “Coral” Orange		パキスタン	25	360	同上
Dona Ana	Long grain rice	袋詰はポルトガル	25	610	Dincore
同上	同上	同上	5	142	同上
Mr. Dock	Long grain rice	不明（タイ？）	25	493	同上
tia Rosa	Arroz de Moçambique	ショクエ	25	385	MIA
同上	同上	同上	10	165	同上
Sasseka	Farinha de milho		50	460	
Mpupu	同上		12.5	120	
Sasseka	Falhina de trigo		50	790	

4. ソファアラ州

4.1 Inhamiswa (Beira 市郊外) の食料品店

商品名	内容（表示）	原産地	kg/袋	価格（MT）	輸入業者
Mariana <Yellow>	Arroz Agulha	パキスタン	25	400	Ayan Trading
Mariana <Blue>	同上	同上	25	420	同上

5. ザンベジア州

5.1 Mopeia の Associação Agricola da Paz（稲作生産者組合・精米所）

商品名	内容（表示）	原産地	kg/袋	価格（MT）
Arroz Tewe	化学物質不使用	地場（Mopeia 県 Tewe）	10	450
同上	同上	同上	1	45
同上（玄米）	同上	同上	1	50

5.2 Morrumbala 市街の食料品店

商品名	内容（表示）	原産地	kg/袋	価格（MT）	輸入業者
Sasseka <Green>	Long grain rice	パキスタン	25	425	Africom Lda.
同上	同上	同上	(量売) 1	20	同上
Xirico <Pink>	Arroz Agulha	ベトナム	25	550	Delta Trading
同上	同上	同上	(量売) 1	25	同上
Arroz da Mamã	5% Broken	ベトナム	25	550	PHOENICIA Comércio e Investimentos Lda.

5.3 Quelimane 市の Confiança（卸売業者）（販売価格は取引量が多ければこれより低い。）

商品名	内容（表示）	原産地	kg/袋	価格（MT）	輸入業者
Sasseka First Choice	Long grain rice	不明	25	445	Africom Lda.
Sasseka “Coral” <Red>	同上	パキスタン	25	440	同上
Sasseka “Coral” <Orange>	同上	同上	25	405	同上
Sasseka “Coral” <Green>	同上	同上	25	395	同上
Xirico <Pink>	Arroz Agulha	ベトナム	25	445	Delta Trading
Xirico <Blue>	同上	パキスタン	25	440	同上
Xirico <Red>	同上	同上	25	410	同上
Mariana <Yellow>	同上	同上	25	400	Ayan Trading

5.4 Quelimane 中央市場

商品名	原産地	単位	仕入価格 (MT)	販売価格 (MT)
コメ	地場 (Namacurra 県 Macuse)	1 缶	4	5
コメ (炒り米)	地場 (Nicoadala 県 Ilalane)	同上	--	6

5.5 Quelimane 市の Supermercado Atlântico (スーパーマーケット)

商品名	内容 (表示)	原産地	kg/袋	価格 (MT)	輸入業者
Sasseka First Choice		不明	25	480	Africom Lda.
Sasseka <Green>	Long grain rice	パキスタン	25	360	Africom Lda.
Xirico <Blue>	25% Broken	パキスタン	25	360	Delta Trading

5.6 Inter Globe Quelimane 店 (卸売業者)

商品名	内容 (表示)	原産地	kg/袋	仕入価格 (MT)	販売価格 (MT)	輸入業者
Xirico <Pink>	5% Broken	ベトナム	25	420	440	Delta Trading
Xirico <Blue>	25% Broken	パキスタン	25	325	340	Delta Trading

6. ナンプラ州

6.1 Nampula 市の Faina (Resta) 市場

商品名	原産地	単位	販売価格 (MT)
コメ	地場 (ザンベジア州 Alto Molócuè 県 Nivala)	1kg	30

6.2 Nampula 市の Prédio Lopes (卸売業者)

商品名	内容 (表示)	原産地	kg/袋	価格 (MT)	輸入業者
Mama Africa Gold	Extra Long	タイ	25	600	Olam International
Lulu <Red>	Super Quality	記載なし	25	550	
Lulu <Yellow>	25% broken	パキスタン	25	375	
Ouro	15% broken	ベトナム	25	440	Grupo MAIAIA
Saboroso Premier Quality	Extra Long	パキスタン	25	360	Olam International

6.3 Nampula 市の Mercado Ideal (高級輸入食品を扱う小規模なスーパーマーケット)

商品名	原産地	kg/袋	販売価格 (MT)	輸入業者
Arroz Inteiro	表示なし	1	35	Comércio Internacional e Services Lda.
同上	表示なし	3	105	同上
同上	表示なし	5	170	同上
同上	表示なし	10	345	同上
Basmati Aromatic Indian Rice	インド	2	139	Tastic (南アフリカ共和国企業)
同上	同上	5	278	同上
Ashoka Indian Basmati Rice	インド	5	295	Ashoka

7. カボ・デルガード州

7.1 Pemba 市の Estabelecimento Zara (卸売業者)

商品名	内容 (表示)	原産地	kg/袋	価格 (MT)	輸入業者
Mama Africa Gold (橙袋)	Extra Long	タイ	25	630	Olam International
Mama Africa (緑袋)	Long Grain	ベトナム	25	440	同上
Saboroso Premier Quality	Extra Long	パキスタン	25	400	同上
Saboroso (白袋)		ミャンマー	25	370	同上
Akadi		ベトナム	25	435	同上
Golden Rhino Premier Quality		ベトナム	25	430	Export Marketing Co. Ltd.
MAIAIA Ouro	15% broken	ベトナム	25	440	Grupo MAIAIA

7.2 Pemba 市の Supermercado Osman Jacob (スーパーマーケット)

商品名	原産地	kg/袋	販売価格 (MT)	輸入業者
Arroz Inteiro	表示なし	1	45	Comércio Internacional e Services Lda.
同上	表示なし	3	135	同上
同上	表示なし	5	220	同上
同上	表示なし	10	450	同上
FALAK Basmati	インド	5	485	Carimo & Filhos Lda.

7.3 Macomia 県 Macomia の食料品店

商品名	内容 (表示)	原産地	kg/袋	価格 (MT)	輸入業者
Golden Rhino Premier Quality		ベトナム	25	470~480	Export Marketing Co. Ltd.
同上		ベトナム	1	20	同上

7.4 Macomia 県 Macomia の露店

商品名	内容 (表示)	原産地	kg/袋	価格 (MT)	輸入業者
Arroz da Mamã	5% Broken	ベトナム	25	480	Export Marketing Co. Ltd.

7.5 Muidumbe 県 N'guri の食料品店

商品名	内容 (表示)	原産地	kg/袋	価格 (MT)	輸入業者
Mama Africa (緑袋)	Long Grain	ベトナム	25	550	Olam International

7. ショクエ灌漑地区にて使用した質問票（英語）

Serial No.

Enumerator's name	
Name of the village	
Date of interview	August 2009

Questionnaire for Sample Households

Name of the Respondent: _____

1. Profile of Household

1-1 Family composition (in the same family budget)

Living status	N O	Relationship with the respondent 1: Wife 2: Husband 3: Child 4: Own Parent 5: Spouse's Parent 7: Grand Parent 8: Grandchild 9: Relative 10: Other (specify)	Sex M/F	Age	Marital Status 1: Married 2: Single 3: Widowed 4: Separated / Divorced	Occupation 1: Full-time farmer 2: Part-time farmer 3: Civil servant 4: Regular employee 5: Casual laborer 6: Business operator 7: Student 8: Other (specify)	Educa-tion		Ethnic Group 1: Changana 2: Chuabo 3: Lomué 4: Macua 5: other (specify)	Religion 1: Christianity 2: Islam 3: other (specify)
							No. of years in school	in		
	1	Respondent								
	2									
	3									
	4									
	5									
	6									
	7									
	8									

Living status "Out": stay other place "HH": Household head

1-2. No. of family members who are available to work for rice cultivation. _____ persons

1-3. Birthplace of the Household head

() Within the District () Other District in the Province () Other Province

1-4. Membership in rural organizations

Does any of the household member participate in any organizations? () Yes () No

If yes, which member belongs to what kind of organization?

Sl. No. of the member in the table 1-1	Name of the organization	Position in the organization (give title if serving as an official)	Major activity of the organization
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	

1-5 Household assets

Do you own the following assets?

	No.		No.		No.
Radio		Mosquito net		Gas cooker	
Bicycle		Sewing machine		Cupboard	
Motorcycle		TV		Car/Sedan	
Car/Pick-up		Cassette player		Other (specify)	

1-6. Living Conditions

1-6-1. House

Do you live in your own house? () Yes () No

If No, whose house do you live in?

() parents' () child's () relative's () Other's (specify)

Is your house in good conditions? () Very Good () Good () Poor () Very Poor

What are the major materials of your house?

- Wall: () Mud/sand () Wood Plank () Bricks () Concrete () Other (specify:)

- Roof: () Tin () Thatch () Leaves () Roof tile () Other (specify)

1-6-2. Water

What is the water source for household use?

() Well () Canal () Rainwater tank () Piped water

() Other (specify)

1-6-3. Light and Fuel

Do you use electricity in your house? () Yes () No

How do you avail the electricity? () lines () Solar panel () Other (specify)

What is used in your house for lighting ?

() Electricity () Kerosene () Gas () Other (specify)

1-6-4. Fuel

What is the major fuel materials used in your house?

() Firewood () Kerosene () Charcoal () Electricity

() Other (specify)

If Firewood is used, how much time is needed for collection for one day use (approx. time on foot)

() 0~15min. () 15~30min. () 30~60min. () Over 60min. () Purchase

1-6-5. Toilet facility

() Pit () Improved latrine () Flush () Other (specify)

1-6-6. Educational Facility

How long does it take by foot from your house to the nearest primary educational facility?

() 0~15min. () 15~30min. () 30~60min. () Over 60min. () Need transportation

1-6-7. Health Facility

How long does it take by foot from your house to the nearest health facility?

() 0~15min. () 15~30min. () 30~60min. () Over 60min. () Need transportation

Has any member of household been sick for the last one year (Apr. '08 - Mar. '09)? () Yes () No

If yes, what were the diseases that they suffered from? (✓ all applicable)

✓if applicable	Disease	Way treated (✓ all applicable)				
		Use medicine sold at market	Brought to the medical facility	Traditional medicine	No treatment	Other (specify)
	Pneumonia					
	Skin diseases					
	Diarrhea					
	Malaria					
	HIV					
	Other (specify)					
	Other (specify)					

1-6-8. Food Security

Did you have food shortage last year (Apr. '08 - Mar. '09)? () Yes () No

If Yes, How many month did you have shortage? _____ month(s)

2. Productive Activities

2-1. On-Farm activities

2-1-1. Crop Production (and summer season, Oct. '08 – Mar. '09)

Season	Crops	Area harvested (ha)	Yield, No. of bags/boxes	The person mainly responsible for production
Winter season Apr.-Sept.'08	Paddy (variety:)			
Summer season Oct. '08 – Mar. '09	Paddy (variety:)			
Annual crops				
Perennial crops				

Note: Crops in a kitchen garden are not entered.

Responsible person(s) 1: Husband 2: Wife 3: Children 4: Other members 5: Jointly by all members

2-1-2. Rice Production

What variety of rice did you grow last year? Wet season () Dry season ()

How have you obtained the seed? (✓ applicable column)

Ways to obtain seed	Wet season	Dry season
Use stored seed produced in previous year		
Get from relatives/ friends/ neighbors for free		
Exchange with relatives/ friends/ neighbors		
Buy from the private traders		
Buy from the research station		
Other (specify)		

Who is mainly responsible for different work of rice cultivation? (Enter 1 for main person, 2 for additional person)

	Husband	Wife	Children	Other family members	Hired laborers
Land Preparation					
Seedling production					
Transplanting					
Weeding					
Harvesting					
Threshing					
Drying & storing					
Marketing					
Other (specify)					

2-1-3. Livestock rearing

	No.		No.		No.		No.
Cattle total		Milking cows		Ox/Bull		Donkey	
Chickens		Ducks		Turkey		Guinea fowl	
Goats		Pigs		Others(specify)		Others(specify)	

2-1-4 .Agricultural machinery and equipment

Do you use the following machinery and equipment? If you used any, is the equipment of your own possession?

	✓ if used	No. owned		✓ if used	No. owned		✓ if used	No. owned
Harrow			Sickle			Hand sprayer		
Knapsack sprayer			Manual thresher			Wheelbarrow		
Animal cart			Oxen-pulled plow			Oxen-pulled harrow		
Hand tractor			Water pump			Rice mill		
Other (specify)			Other (specify)			Othes (specify)		

2-1-5. Utilization of Agro-inputs

Did you use any of the following input for agricultural production during last year? If Yes, provide the details.

Agro-input	✓ if used	For what crop?	Amount used / ha.	From whom was it obtained?	Cost per unit (Mt)
Fertilizer			Bags / ha.		/ bag
			/ ha.		
Insecticides			Kg / ha.		/ Kg
			/ ha.		
Herbicides			Kg / ha.		/
			/ ha.		
Certified seed			/ ha.		/
			/ ha.		
Organic fertilizer			/ ha.		/ bag
			/ ha.		
Other (specify)					

2-1-6. Hired Labor

Did you hire any labor for agricultural production during last year (Apr. '08 - Mar. '09)? () Yes () No

If Yes, for which crop, for what kind of work, for how many days, and how much did you pay for the labor?

Crop	Work done by the hired laborer(s)	Did you provide machine / animal used for the work?	No. of days	Daily wage (Mt)	Other provision
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			

2-1-7. Problems and Prospects on Farming Activities

What is the most serious problem for your farming activities?

Shortage of irrigation water	Soil fertility	Unavailability of inputs
High price of inputs	Pests and diseases	Lack of technical information
Labor shortage	Lack of post harvest facilities	Marketing channels
Difficulty to transport the produce	Drought/Flood	Other (specify)

What are the prospects for your farming activities in the future?

Increase of cultivated area	Introduction of HYV	Introduction of high value crop
Crop diversification	Mechanization	Organic farming
Contract farming	Other (specify)	

2-2. Off-farm Activities (as for last year Apr. 08-Mar.09)

Has any family member permanently been employed? () Yes () No

If Yes, what are their occupations? _____

Has any family member operated any business of their own? () Yes () No

If Yes, what kind of business does the member operate?

() shop () vending () Credit () Other (specify) _____

Has any family member been engaged in household Industry and/ or handicraft?

Products	Major materials needed	Source of materials	Where did the member learn the technique?	Marketing route
		1. Self produce 2. Buy within the village 3. Buy from shops outside 4. Other (Specify)		1:Trader 2: Middleman 3. Wholesaler 4.Retailer 5: Coops 6.Self-marketing 7: Other (specify)

3. Agricultural Support Services

3-1. Information Source of Agricultural Techniques (✓ in plural if necessary)

No information available	Extension Office	Relatives	Neighbors	Other (specify)
Radio program	TV program	Agro input traders	Buyers	

3-2. Agricultural Credit and Finance

Have you availed any credit for farm activities during last year (Apr. '08-Mar. '09)? () Yes () No

If yes, provide the details in the following table.

Source of credit	Amount (Mt)	Interest (% / year)	Loan period (Months)	Purpose	Due amount to be paid back as of Aug. 09 (Mt)

3-3. Marketing of Products

How do you sell your agricultural produce?

Marketing means	Major agricultural produce					
	Rice	Maize	Vegetable			Livestock
Buyers come and buy from your farm						
Transport the produce to buyers' place						
Sell within the village						
Sell at nearby local market						
Sell at district market						
Other (specify)						

4. Household Economy

4-1. Land Holding

Land use		Housing & Garden	Paddy Land (irrigated)	Paddy Land (non-irrigated)	Upland (annual crop)	Upland (perennial crop)	Forest
Cultivated	Ha.						
Owned	Ha.						

Do you rent any land of other owners?

() Yes () No

If Yes, how many hectares of land do you currently rent?

_____ Ha.

What is the condition of the rent?

Plot sl.	Rental period	Rental fee (Mt/ha.)	Way of payment	Collateral required?
1				() Yes () No
2				() Yes () No

Do you lease out any land of yours to any other persons?

() Yes () No

If Yes, how many hectares of land is currently leased out?

_____ Ha.

What is the condition of the lease?

Plot sl.	Lease period	Lease fee (Mt/ha.)	Way of payment	Collateral required?
1				() Yes () No
2				() Yes () No

4-2 Farm Income of All Family Members (for the past one year from Apr.'08 to Mar.'09)

Crops sold	Quantity for sales	Unit price	Amount	Expenses for selling
	(No. of bags/boxes)	(Mt per bag/box)	(Mt)	(Mt per bag/box)
Paddy (Total)				
Annual crops				
Maize				
Perennial crops				
Livestock and aquatic products sold	Quantity for sales	Unit price	Amount	Expenses for selling
	(No.)	(Mt)	(Mt)	(Mt per unit)
Chicken				
Cows & bulls				
Milk & other dairy produce				
Fish				
Other (specify)				
Other (specify)				

4-3 Non-Farm Income of All Family Members (for the past one year from Apr.'08 to Mar.'09)

Items	Periodical Income (Mt)	Frequency of income	Annual Total (Mt)
Salary by employment	/ Month	Months	
Wages from permanent employment (farm work, etc.)	/ Month	Months	
Wages from casual work	/ Day	Days	
Self-employed (shops, factory, restaurants, etc.)	/ Month	Months	
Sale of household industry / handicraft products	/ Month	Months	
Charges for land lease	/ Season	Seasons	
Remittance	/ Year		
Other (specify _____)			
Total			

4-4. Living Expenses

Approximately how much do you spend for the following items?

Items	Periodical Expenditure (Mt)
1 Food items	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
2 Daily consumables	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
3 Electricity charges	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
4 Education (Fees and materials)	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
5 Medical care	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
6 House maintenance & furniture	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
7 Recreation & ceremonial occasions	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
8 Transportation & communication	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
9 Loan repayment	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
10 Taxes, dues, contribution, etc.	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
11 Deposit & savings	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
12 Other (specify _____)	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year

Which living expenses in the above table do you feel the heaviest for your household? _____
 (Indicate the serial no. of the table)

8. ショクエ灌漑地区にて使用した質問票（ポルトガル語）

Nr. de série

Nome do inquiridor	
Nome da Aldeia	
Data	Agosto 2009

Questionário para Agregados Produtores

Nome do Inquirido: _____

1. Perfil da Residencia

1-1 Composição da família (dentro do mesmo orçamento da família)

Notas especiais	Nr. Série	Grau parentesco com o inquirido 1: Esposa 2: Marido 3: Filho 4: Pai/Mae 5: Sogro/a 7: Avo/ô 8: Neto/a 9: Parente 10: Outro (especifique)	Sexo M/F	Idade	Estado Civil 1: Casado 2: Solteiro 3: Viuvo 4: Separado/ Divorciado	Ocupação 1: agricultor a tempo inteiro 2: Agricultor a tempo parcial 3: Funcionario Publico 4: Empregado nãoormal 5: Eventual 6: Negociante 7: Estudante 8: Outro (especifique)	Educação Nr. De anãos na escola	Etnia 1: Changana 2: Chuabo 3: Lomuê 4: Macua 5: Outro (especifique)	Religiao 1: Crista 2: Islamica 3: outra (especifique)
	1	Inquirido							
	2								
	3								
	4								
	5								
	6								
	7								
	8								

Notas especiais : “Fora”: vive em outro local “CAF”: Chefe de Família

1-2. Nr. Dos membros da família disponíveis para o cultivo do arroz. _____ pessoas

1-3. Local de nascimento do chefe de família

() Dentro do Distrito () Outra Provincia ou Distrito () Outra Provincia

1-4. Membro de alguma associação rural

Algum membro da família pertence a alguma associação? () Sim () Não

Se sim, que membros pertencem a que tipo de associação?

Sl. Nro do membro na Tabela 1-1	Nãome da Associação	Posição na Associação (Diga o Cargo se tiver)
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples

1-5 Bens da Família

Tem algum destes bens em casa?

	Nr.		Nr.		Nr.
Radio		Televisao		Carro	
Bicicleta		Mota		Maquina de Costurar	
Rede Mosquiteira				Outro (especifique)	

1-6. Condições Habitacionais

1-6-1. Casa

Vive em casa Própria? Sim Não

Se Não, vive em casa de quem? pais filhos familiares Outros (especifique)

A sua casa tem boas condições? Muito Boas Boas Más Muito más

De que materiais é feita a casa?

- Parede: Matope/areia Madeira/estacas Blocos Cimento
 Outro (especifique: _____)

- Cobertura: Chapa capím Telhas Outro (especifique _____)

1-6-2. Água

De onde tiram a agua que bebem em casa?

Poço Canal Tanque de aguas da chuva agua canalizada
 Outro (especifique _____)

1-6-3. Fonte de Energia

Tem luz em casa? Sim Não

De onde vem a energia? da rede Paineis solares Outro (especifique _____)

O que utilizam para a iluminação em casa ?

Electricidade Petroleo Gas Outro (especifique _____)

Quais são os principais combustiveis que usam em casa?

Lenha Petróleo Carvão Electricidade
 Outro (especifique _____)

Se usam lenha, quanto tempo levam a procurar lenha? (tempo aproximado a pé)

0~15min. 15~30min. 30~60min. mais de 60min. Compra

1-6-4. Casas de banho

Cova Latrina Melhorada Casa de banho com autoclismo Outro
especifique _____)

1-6-5. EScola

Quanto tempo levam para chegar a escola mais próxima a pé?

0~15min. 15~30min. 30~60min. Mais de 60min. Precisa de transporte

1-6-6. Posto de Saúde

Quanto tempo leva a pé para chegar ao hospital mais próximo?

() 0~15min. () 15~30min. () 30~60min. () Mais de 60min. () Precisa de transporte

Alguem na familia ficou doente no ultimo ano (Abr. '08 - Mar. '09)? () Sim () Não

Se sim, de que padeciam? (✓todas aplicaveis)

✓se aplicavel	Doença	Qual foi o tratamento que usou (✓todas aplicaveis)				
		Usou medicamento que se vende na farmacia	Medicamento que se da no hospital	Medicamento Tradicional	Não se tratou	Outro (especifique)
	Pneumonia					
	Doença de pele					
	Diarreia					
	Malaria					
	HIV					
	Outro (especifique)					
	Outro (especifique)					

1-6-8. Segurança alimentar

Chegou de faltar-lhe comida no ano passado (Apr. '08 - Mar. '09)? () Sim () Não

Se Sim, quantos meses ficou sem comida? _____meses

2. Actividade Produtiva

2-1. Actividades na Machamba

2-1-1. Produção de Alimentos (e na época de verao, Out. '08—Mar. '09)

Época	Culturas	Área colhida (ha)	Rendimento. Nr. de Sacos/caixas	A pessoa responsável pela produção
Epóca de Inverno Abr.-Set.'08	Arroz (variedade:)			
Epoca de Verao Out. '08—Mar. '09	Arroz (variedade:)			
Culturas Anuais				
Culturas anuais				

Nota: Culturas caseiras não devem ser consideradas.

Pessoal Responsável(s) 1: Marido 2: Mulher 3: Filhos 4: Outros membros 5: Conjuntamente com todos os membros

2-1-2. Produção de Arroz

Quais foram as variedades de arroz que plantaram ano passado?

Época seca () Época Chuvosa ()

Onde arranjam a semente? (✓coluna aplicável)

Formas para obter a semente	Época Chuvosa	Época Seca
Usaram a semente armazenada que produziram no ano passado		
Foram oferecidas por vizinhos/familiares/amigos		
Trocaram com vizinhos/familiares/amigos		
Compraram de revendedores privados		
Compraram na estação de investigação		
Outro (especifique)		

Quem é o principal responsável pelas diferentes fases na **produção de arroz**? (Escreva 1 para a principal pessoa e 2 pela pessoa adicional)

	Marido	Mulher	Filhos	Outros membros da família	Trabalhadores contratados
Preparação da Terra					
Produção de semente					
Transplante					
Monda					
Colheita					
Debulha					
Secagem & armazenamento					
Venda					
Outro (especifique)					

2-1-3. Criação de animais

	Nr.		Nr.		Nr.		Nr.
Total de Gado		Vacas Leiteiras		Touros		Burros	
Galinhas		Patos		Perús		Patos da Guinéa	
Cabritos		Porcos		Outros(especifique)		Outros(especifique)	

2-1-4. Maquinaria e equipamento Agrícola

Usam algum equipamento ou máquinas? Se sim, o equipamento é próprio?

	✓ se tem		✓ se tem		✓ se tem
Grade		Foice		Pulverizador manual	
Saco de Pulverizador		Debulhadora manual		Carrinho de mão	
Carroça Animal		Charrua animal		Grade animal	
Tractor de mão		Bomba de água		Moinho de arroz	
Outro (especifique)		Outro (especifique)		Outros (especifique)	

2-1-5. Utilizaçãode Insumos agrícolas

Usou algum destes insumos agrícolas para a produção agrícola no ano passado? () Sim () Não

Se Sim, dê detalhes.

Insumos Agrícolas	✓ se usou	Para que cultura?	Quantidade usada / ha.	De onde obteve?	Custo por unidade (Mt)
Fertilizantes			Sacos / ha.		/ sacco
			/ ha.		
Insecticidas			Kg / ha.		/ Kg
			/ ha.		
Herbicidas			Kg / ha.		/
			/ ha.		
Sementes Certificadas			/ ha.		/
			/ ha.		
Fertilizantes Organicos			/ ha.		/ sacco
			/ ha.		
Outro (especifique)					

2-1-6. Mão de obra contratada

Contractou alguma mao-de-obra para a produção Agrícola durante o ano passado (Abr. '08 - Mar. '09)?

() Sim () Não

Se Sim, para que Cultura, para que tipo de trabalho, por quantos dias, e quanto pagou pela mao-de-obra?

Cultura	Trabalho feito pelos contratados(s)	Usaram alguma maquina/animal para o trabalho?	Nr de dias	Taxa diaria (Mt)	Outras coisas
		<input type="checkbox"/> Não foi necessario <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus proprios meios			
		<input type="checkbox"/> Não foi necessario <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus proprios meios			
		<input type="checkbox"/> Não foi necessario <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus proprios meios			
		<input type="checkbox"/> Não foi necessario <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus proprios meios			

2-1-7. Problemas e Perspectivas na Actividade Agrícola

Qual é o principal problema da sua actividade Agrícola?

Falta de água para rega	Fertilidade dos solos	Falta de insumos
Preços dos insumos muito alto	Pestes e doenças	Falta de informação técnica
Falta de mão de obra	Falta de facilidades pós colheita	Canais de Mercado
Dificuldade para transportar a produção	Secas/ Cheias	Outro (especifique)

Quais as perspectivas da sua actividade Agrícola no futuro?

Aumento da área de cultivo	Introdução da nova variedade	Introdução de culturas mais rentáveis
Diversificação de Cultura	Mecanização	Agricultura Orgânica
Agricultura Contratado	Outro (especifique)	

2-2. Actividades Extra Machamba (durante o ano passado Abr. 08-Mar.09)

Algun membro da família tem um emprego fixo? () Sim () Não

Se Sim, o que faz? _____

Algun membro da familia é negociante? () Sim () Não

Se Sim, que tipo de negocio tem?

() Loja () banca () Credito () Outro (especifique) _____

Algun membro da família tem alguma industria caseira/ artesanato? () Sim () Não

Se sim, dê detalhes na tabela que se segue.

Produtos	Fonte dos Materiais	Rota de Mercado
	1. Produz sozinho 2. compra na zona 3. compra nas lojas fora da cidade 4. Outro (Especifique)	1:Comerciante 2:Intermediario 3.Armazenista 4.Retalhista 5: Coops. 6.Auto venda 7: Outro (especifique)

3. Serviços de Apoio Agrário**3-1. Fontes de INformaçõesobre Tecnicas Agricolas** (✓ no plural se necessário)

Não há informação disponível	Extensionistas	Familiares	Vizinhos	Outro (especifique)
Programa de Radio	Programa de TV	Vendedores de insu- mos agricolas	Compradores	

3-2. Financiamento e Credito à Agricultura

Recebeu algum credito para a agricultura ano passado (Abr. '08-Mar. '09)? () Sim () Não

Se sim, dê detalhes na tabela que se segue.

Fonte de Credito	Valor (Mt)	Taxa de juro (%/ano)	Periodo de Credito (Mêses)	Objectivo

3-3. Venda de Produtos

Como é que vende os seus produtos agricolas?

Venda significa	Principais Produtos Agrícolas					
	Arroz	Milho	Hortícolas	(especifique)	(especifique)	Animais
Os Clientes vem e compram na sua machamba						
Transporta os produtos até ao comprador						
Vende na comunidade						
Vende no Mercado perto						
Vende no Mercado do distrito						

Outro (especifique)						
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4. Economia familiar

4-1. Posse de Terra

Uso de Terra		Canteiros de casa	Arroz	Amontante	Floresta
Cultivada	Ha.				
Posse	Ha.				

Aluga terra de outros donos?

() Sim () Não

Se Sim, quantos Hectares tem alugados agora?

_____ Ha.

Qual é a condição da renda?

Plot sl.	Período de aluguer	Renda (Mt/ha.)	Forma de pagamento	Garantias exigidas?
1				() Sim () Não
2				() Sim () Não

Aluga a sua área a outras pessoas?

() Sim () Não

Se Sim, quantos hectares de terra estão alugados?

_____ Ha.

Qual é a condição deste aluguer?

Plot sl.	Período de aluguer	Renda (Mt/ha.)	Forma de pagamento	Garantias exigidas?
1				() Sim () Não
2				() Sim () Não

4-2 Rendimento por machamba de todos os membros da Família (do ano passado desde Abr.'08 a Mar.'09)

Produtos vendidos	Quantidade para vendas (Nr. de sacos/caixas)	Preço por unidade (Mt por saco/caixa)	Despesas para vender (Mt por saco/caixa)
Arrozal (Total)			
Culturas anuais			
Milho			
Culturas Perenais			
Teve algum rendimento proveniente da animais e produtos pesqueiros? () Sim () Não			
Pprodutos vendidos	Quantidade para vendas (Nr.)	Preço por unidade (Mt)	Despesas para vender (Mt por unidade)
(especifique)			
(especifique)			
(especifique)			

4-3 Rendimentos Não-Agrícolas de todos os membros da família (Abr. '08-Mar. '09)

Itens	✓ se tiver o rendimento	Rendimento Periódico (Mt)	Frequência de rendimento	Total Anual (Mt)
Salário por emprego		/ Mês	Mês	
Rendimento do emprego fixo (trabalho agrícola, etc.)		/ Mês	Mês	
Salários de trabalho casual		/ Dia	Dias	
Auto emprego(lojas, fabrica, restaurantes, etc.)		/ Mês	Mês	
Venda de produtos caseiros/ artesanato		/ Mês	Mês	
Pagamentos pelo aluguer de terra		/ Época	Épocas	
Remessas		/ Ano		
Outro (especifique _____)				

4.4. Despesas correntes

Despendeu algum valor nos seguintes itens (Abr. '08-Mar. '09) ?

Itens		✓ se tiver gasto	Despesas Periodicas (Mt)	
1	Produtos alimentares		/ <input type="checkbox"/> dia <input type="checkbox"/> semana <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
2	Consumiveis diarios		/ <input type="checkbox"/> dia <input type="checkbox"/> semana <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
3	Despesas com electricidade		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
4	Educação (taxas e materiais)		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
5	Cuidados Medicos		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
6	Manutenção de casa e mobiliario		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
7	Ocasão Festiva & cerimoniais		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
8	Transporte & comunicação		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
9	Pagamento de Crédito		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
10	Taxas, direitos, contribuição, etc.		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
11	Depositos & poupanças		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto
12	Outro (especifique _____)		/ <input type="checkbox"/> mês <input type="checkbox"/> ano	<input type="checkbox"/> não sei quanto

Qual das despesas mencionadas acha que são muito pesadas para si ou para sua família? _____

(Indique o Nr. de serie na tabela)

9. ナンテ灌漑地区にて使用した質問票（英語）

Serial No.

Enumerator's name	
Name of the village	
Date of interview	August 2009

Questionnaire for Sample Households

Name of the Respondent: _____

1. Profile of Household

1-1 Family composition (in the same family budget)

Special notes	SI No	Relationship with the respondent 1: Wife 2: Husband 3: Child 4: Own Parent 5: Spouse's Parent 7: Grand Parent 8: Grandchild 9: Relative 10: Other (specify)	Sex M/F	Age	Marital Status 1: Married 2: Single 3: Widowed 4: Separated / Divorced	Occupation 1: Full-time farmer 2: Part-time farmer 3: Civil servant 4: Regular employee 5: Casual laborer 6: Business operator 7: Student 8: Other (specify)	Educa-tion No. of years in school	Ethnic Group 1: Changana 2: Chuabo 3: Lomué 4: Macua 5: other (specify)	Religion 1: Christianity 2: Islam 3: other (specify)
	1	Respondent							
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								

Living status "Out": stay other place "HH": Household head

1-2. No. of family members who are available to work for rice cultivation. _____ persons

1-3. Birthplace of the Household head

() Within the District () Other District in the Province () Other Province

1-4. Membership in rural organizations

Does any of the household member participate in any organizations? () Yes () No

If yes, which member belongs to what kind of organization?

SI. No. of the member in the table 1-1	Name of the organization	Position in the organization (give title if serving as an official)	Major activity of the organization
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	
		<input type="checkbox"/> Official () <input type="checkbox"/> Member	

1-5 Household assets

Do you own the following assets?

	No.		No.		No.
Radio		Mosquito net		Gas cooker	
Bicycle		Sewing machine		Cupboard	
Motorcycle		TV		Car/Sedan	
Car/Pick-up		Cassette player		Other (specify)	

1-6. Living Conditions

1-6-1. House

Do you live in your own house? () Yes () No

If No, whose house do you live in?

() parents' () child's () relative's () Other's (specify)

Is your house in good conditions? () Very Good () Good () Poor () Very Poor

What are the major materials of your house?

- Wall: () Mud/sand () Wood Plank () Bricks () Concrete () Other (specify:)

- Roof: () Tin () Thatch () Leaves () Roof tile () Other (specify)

1-6-2. Water

What is the water source for household use?

() Well () Canal () Rainwater tank () Piped water

() Other (specify)

1-6-3. Light

Do you use electricity in your house? () Yes () No

How do you avail the electricity? () lines () Solar panel () Other (specify)

What is used in your house for lighting ?

() Electricity () Kerosene () Gas () Other (specify)

1-6-4. Fuel

What is the major fuel materials used in your house?

() Firewood () Kerosene () Charcoal () Electricity

() Other (specify)

If Firewood is used, how much time is needed for collection for one day use (approx. time on foot)

() 0~15min. () 15~30min. () 30~60min. () Over 60min. () Purchase

1-6-5. Toilet facility

() Pit () Improved latrine () Flush () Other (specify)

1-6-6. Educational Facility

How long does it take by foot from your house to the nearest primary educational facility?

() 0~15min. () 15~30min. () 30~60min. () Over 60min. () Need transportation

1-6-7. Health Facility

How long does it take by foot from your house to the nearest health facility?

() 0~15min. () 15~30min. () 30~60min. () Over 60min. () Need transportation

Has any member of household been sick for the last one year (Apr. '08 - Mar. '09)? () Yes () No

If yes, what were the diseases that they suffered from? (✓ all applicable)

✓ if applicable	Disease	Way treated (✓ all applicable)				
		Use medicine sold at market	Brought to the medical facility	Traditional medicine	No treatment	Other (specify)
	Pneumonia					
	Skin diseases					
	Diarrhea					
	Malaria					
	HIV					
	Other (specify)					
	Other (specify)					

1-6-8. Food Security

Did you have food shortage last year (Apr. '08 - Mar. '09)? () Yes () No

If Yes, How many month did you have shortage? _____ month(s)

2. Productive Activities

2-1. On-Farm activities

2-1-1. Crop Production (and summer season, Oct. '08—Mar. '09)

Crops	Area harvested (ha)	Yield, No. of bags/boxes	The person mainly responsible for production

Note: Crops in a kitchen garden are not entered.

Responsible person(s) 1: Husband 2: Wife 3: Children 4: Other members 5: Jointly by all members

2-1-2. Rice Production

What variety of rice did you grow last year? ()

How have you obtained the seed? (✓ applicable column)

Ways to obtain seed	✓ all applicable
Use stored seed produced in previous year	
Get from relatives/ friends/ neighbors for free	
Exchange with relatives/ friends/ neighbors	
Buy from the private traders	

Buy from the research station	
Other (specify)	

Who is mainly responsible for different work of rice cultivation? (Enter 1 for main person, 2 for additional person)

	Husband	Wife	Children	Other family members	Hired laborers
Land Preparation					
Seedling production					
Transplanting					
Weeding					
Harvesting					
Threshing					
Drying & storing					
Marketing					
Other (specify)					

2-1-3. Livestock rearing

	No.		No.		No.		No.
Cattle total		Milking cows		Ox/Bull		Donkey	
Chickens		Ducks		Turkey		Guinea fowl	
Goats		Pigs		Others(specify)		Others(specify)	

2-1-4 .Agricultural machinery and equipment

Do you use the following machinery and equipment? If you used any, is the equipment of your own possession?

	✓ if owned		✓ if owned		✓ if owned
Harrow		Sickle		Knapsack sprayer	
Manual thresher		Wheelbarrow		Animal cart	
Oxen-pulled plow		Oxen-pulled harrow		Hand tractor	
Water pump		Rice mill		Other (specify)	

2-1-5. Utilization of Agro-inputs

Did you use any of the following input for agricultural production during last year? If Yes, provide the details.

Agro-input	✓ if used	For what crop?	Amount used / ha.	From whom was it obtained?	Cost per unit (Mt)
Fertilizer			Bags / ha.		/ bag
			/ ha.		
Insecticides			Kg / ha.		/ Kg
			/ ha.		
Herbicides			Kg / ha.		/
			/ ha.		
Certified seed			/ ha.		/
			/ ha.		
Organic fertilizer			/ ha.		/ bag
			/ ha.		
Other (specify)					

--	--	--	--	--	--

2-1-6. Hired Labor

Did you hire any labor for agricultural production during last year (Apr. '08 - Mar. '09)? () Yes () No
 If Yes, for which crop, for what kind of work, for how many days, and how much did you pay for the labor?

Crop	Work done by the hired laborer(s)	Did you provide machine / animal used for the work?	No. of days	Daily wage (Mt)	Other provision
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			
		<input type="checkbox"/> No need <input type="checkbox"/> I provided <input type="checkbox"/> Laborers used their own			

2-1-7. Problems and Prospects on Farming Activities

What is the most serious problem for your farming activities?

Shortage of irrigation water	Soil fertility	Unavailability of inputs
High price of inputs	Pests and diseases	Lack of technical information
Labor shortage	Lack of post harvest facilities	Marketing channels
Difficulty to transport the produce	Drought/Flood	Other (specify)

What are the prospects for your farming activities in the future?

Increase of cultivated area	Introduction of HYV	Introduction of high value crop
Crop diversification	Mechanization	Organic farming
Contract farming	Other (specify)	

2-2. Off-farm Activities (as for last year Apr. 08-Mar.09)

Has any family member permanently been employed? () Yes () No

If Yes, what are their occupations? _____

Has any family member operated any business of their own? () Yes () No

If Yes, what kind of business does the member operate?

() shop () vending () Credit () Other (specify) _____

Has any family member been engaged in household industry and/ or handicraft? () Yes () No

Products	Major materials needed	Source of materials 1. Self produce 2. Buy within the village 3. Buy from shops outside 4. Other (Specify)	Where did the member learn the technique?	Marketing route 1:Trader 2: Middleman 3. Wholesaler 4.Retailer 5: Coops 6.Self-marketing 7: Other (specify)

3. Agricultural Support Services

3-1. Information Source of Agricultural Techniques (✓ in plural if necessary)

No information available	Extension Office	Relatives	Neighbors	Other (specify)
Radio program	TV program	Agro input traders	Buyers	

3-2. Agricultural Credit and Finance

Have you availed any credit for farm activities during last year (Apr. '08-Mar. '09)? () Yes () No

If yes, provide the details in the following table.

Source of credit	Amount (Mt)	Interest (% / year)	Loan period (Months)	Purpose	Due amount to be paid back as of Aug. 09 (Mt)

3-3. Marketing of Products

How do you sell your agricultural produce?

Marketing means	Major agricultural produce					
	Rice	Maize	Vegetable			Livestock
Buyers come and buy from your farm						
Transport the produce to buyers' place						
Sell within the village						
Sell at nearby local market						
Sell at district market						
Other (specify)						

4. Household Economy

4-1. Land Holding

Land use		Paddy Land (irrigated)	Paddy Land (non-irrigated)	Upland (annual crop)	Upland (perennial crop)
Cultivated	Ha.				
Owned	Ha.				

Do you rent any land of other owners? () Yes () No

If Yes, how many hectares of land do you currently rent? _____ Ha.

What is the condition of the rent?

Plot sl.	Rental period	Rental fee (Mt/ha.)	Way of payment	Collateral required?
1				() Yes () No
2				() Yes () No

Do you lease out any land of yours to any other persons? () Yes () No

If Yes, how many hectares of land is currently leased out? _____ Ha.

What is the condition of the lease?

Plot sl.	Lease period	Lease fee (Mt/ha.)	Way of payment	Collateral required?
1				() Yes () No
2				() Yes () No

4-2 Farm Income of All Family Members (for the past one year from Apr.'08 to Mar.'09)

Crops sold	Quantity for sales	Unit price	Amount	Expenses for selling
	(No. of bags/boxes)	(Mt per bag/box)	(Mt)	(Mt per bag/box)
Paddy (Total)				
Annual crops				
Maize				
Perennial crops				
Livestock and aquatic products sold	Quantity for sales	Unit price	Amount	Expenses for selling
	(No.)	(Mt)	(Mt)	(Mt per unit)
(specify)				
(specify)				
(specify)				

4-3 Non-Farm Income of All Family Members (for the past one year from Apr.'08 to Mar.'09)

Items	Periodical Income (Mt)	Frequency of income	Annual Total (Mt)
Salary by employment	/ Month	Months	
Wages from permanent employment (farm work, etc.)	/ Month	Months	
Wages from casual work	/ Day	Days	
Self-employed (shops, factory, restaurants, etc.)	/ Month	Months	
Sale of household industry / handicraft products	/ Month	Months	
Charges for land lease	/ Season	Seasons	
Remittance	/ Year		
Other (specify _____)			
Total			

4.4. Living Expenses

Approximately how much do you spend for the following items?

Items		Periodical Expenditure (Mt)
1	Food items	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
2	Daily consumables	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
3	Electricity charges	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
4	Education (Fees and materials)	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
5	Medical care	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
6	House maintenance & furniture	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
7	Recreation & ceremonial occasions	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
8	Transportation & communication	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
9	Loan repayment	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
10	Taxes, dues, contribution, etc.	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
11	Deposit & savings	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year
12	Other (specify _____)	/ <input type="checkbox"/> day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year

Which living expenses in the above table do you feel the heaviest for your household? _____
 (Indicate the serial no. of the table)

10. ナンテ灌漑地区にて使用した質問票（ポルトガル語）

Nr. de série
Data

Nome do inquiridor	
Nome da Aldeia	

Questionário para Agregados Familiares Produtores

Nome do Inquirido: _____

Nome da Aldeia onde reside _____

1. Perfil da Residencia

1-1 Composição da família (dentro do mesmo orçamento da família)

Notas especiais *	Nr. Série	Grau parentesco com o inquirido 1: Esposa 2: Marido 3: Filho 4: Pai/Mae 5: Sogro/a 7: Avo/ô 8: Neto/a 9: Parente 10: Outro (especifique)	Sexo M/F	Idade	Estado Civil 1: Casado 2: Solteiro 3: Viuvo 4: Separado/ Divorciado	Ocupação 1: agricultor a tempo inteiro 2: Agricultor a tempo parcial 3: Funcionario Publico 4: Empregado nãoormal 5: Eventual 6: Negociante 7: Estudante 8 Outro (especifique)	Educação Nr. De anãos na escola	Etnia 1: Changana 2: Chuabo 3: Lomué 4: Macua 5. Outro (especifique)	Religiao 1: Crista 2: Islamica 3: outra (especifique)
	1	Inquirido							
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								

* Notas especiais : "Fora": vive em outro local

"CAF": Chefe do Agregado Familia

1-2. Nr. de agregado familiar disponiveis para o trabalho da machamba _____ pessoas

1-3. Local de nascimento do chefe de familia

() Dentro do Distrito Maganja da Costa

() Dentro do Distrito Namacurra

() Outro Distrito na Provincia Zambezia

() Outra Provincia

1-4. Membro de alguma associação rural

Algum membro da família pertence a alguma associação?

() Sim

() Não

Se sim, que membros pertencem a que tipo de associação?

Sl. Nro do membro na Tabela 1-1	Nãome da Associação	Posição na Associação (Diga o Cargo se tiver)
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples
		<input type="checkbox"/> MCD () <input type="checkbox"/> Membro simples

1-5 Bens da Família

Tem algum destes bens em casa?

	Nr.		Nr.		Nr.
Radio		Televisao		Carro	
Bicicleta		Mota		Maquina de Costurar	
Rede Mosquiteira				Outro (especifique)	

1-6. Condições Habitacionais

1-6-1. Casa

Vive em casa Própria? () Sim () Não

Se Não, vive em casa de quem? () pais () filhos () familiares () Outros (especifique)

A sua casa tem boas condições? () Muito Boas () Boas () Más () Muito más

De que materiais é feita a casa?

- Paredes: () Matope/areia () Madeira/estacas () Blocos () Cimento
() Outro (especifique:)

- Cobertura: () Chapa () capim () Telhas () Outro (especifique)

1-6-2. Água

De onde tiram a agua que bebem em casa?

() Poço () Canal () Tanque de aguas da chuva () agua canalizada
() Outro (especifique)

1-6-3. Fonte de Energia

Tem luz em casa? () Sim () Não

De onde vem a energia? () da rede () Paineis solares () Outro (especifique)

O que utilizam para a iluminação em casa ?

() Electricidade () Petroleo () Gas () Outro (especifique)

Quais são os principais combustiveis que usam em casa?

() Lenha () Petróleo () Carvão () Electricidade () Outro (especifique)

Se usam lenha, quanto tempo levam a procurar lenha? (tempo aproximado a pé)

() 0~15min. () 15~30min. () 30~60min. () mais de 60min. () Compra

1-6-4. Casas de banho

() Cova () Latrina Melhorada () Casa de banho com autoclismo
() Outro (especifique)

1-6-5. Escola

Quanto tempo levam para chegar a escola mais próxima a pé?

() 0~15min. () 15~30min. () 30~60min. () Mais de 60min. () Precisa de transporte

1-6-6. Posto de Saúde

Quanto tempo leva a pé para chegar ao hospital mais próximo?

() 0~15min. () 15~30min. () 30~60min. () Mais de 60min. () Precisa de transporte

Alguem na familia ficou doente no ultimo ano (Abr. '08 - Mar. '09)? () Sim () Não

Se sim, de que padeciam? (✓todas aplicaveis)

✓se aplicavel	Doença	Qual foi o tratamento que usou (✓todas aplicaveis)				
		Usou medicamento que se vende na farmacia	Medicamento que se da no hospital	Medicamento Tradicional	Não se tratou	Outro (especifique)
	Pneumonia					
	Doença de pele					
	Diarreia					
	Malaria					
	HIV					
	Outro (especifique)					

1-6-8. Segurança alimentar

Chegou de faltar-lhe comida no ano passado (Apr. '08 - Mar. '09)? () Sim () Não

Se Sim, quantos meses ficou sem comida? _____meses

2. Actividade Produtiva

2-1. Actividades na Machamba

2-1-1. Posse de Terra

Uso de Terra		Arroz		Amontante
		Regadio	Não Regadio	
Posse	(Ha.)			
Cultivada	(Ha.)			

Aluga terra de outros donos? () Sim () Não

Se Sim, quantos Hectares tem alugados agora? _____ Ha.

Qual é a condição da renda?

Plot sl.	Período de aluguer (mes)	Renda (Mt/ha.)	Forma de pagamento	Garantias exigidas?
1				() Sim () Não
2				() Sim () Não

Aluga a sua área a outras pessoas? () Sim () Não

Se Sim, quantos hectares de terra estão alugados? _____ Ha.

Qual é a condição deste aluguer?

Plot sl.	Período de aluguer (mês)	Renda (Mt/ha.)	Forma de pagamento	Garantias exigidas?
1				() Sim () Não
2				() Sim () Não

2-1-2. Produção de Alimentos (Todas as culturas cultivadas durante a última época)

Culturas (Culturas caseiras não devem ser consideradas)	Período de Produção (mês-mês)	Área colhida (ha)	Rendimento (Nr. de Sacos)	A pessoa responsável pela produção			
				1: Marido membros	2: Mulher membros	3: Filhos	4: Outros
Arroz				5: Conjointamente com todos os membros			

Planta qualquer cultura de alimento a volta da casa? Sim Não
 Se Sim, que culturas? _____

2-1-3. Produção de Frutas

Tem qualquer fruteira? Sim Não Se Sim, dê detalhes na tabela que se segue.

Frutas	Nr. de arvores	Mês de Colheta	Vende a sua colheta? Se, sim, Quanto e que recebeu das vendas? (Mt.)	
			<input type="checkbox"/> Não	<input type="checkbox"/> Sim
			<input type="checkbox"/> Não	<input type="checkbox"/> Sim
			<input type="checkbox"/> Não	<input type="checkbox"/> Sim
			<input type="checkbox"/> Não	<input type="checkbox"/> Sim
			<input type="checkbox"/> Não	<input type="checkbox"/> Sim

2-1-4. Produção de Arroz

Já cultivou arroz? Sim Não Se Sim, responde as seguintes perguntas.

Quais foram as variedades de arroz que plantaram ano passado? ()
 Onde arranjaram a semente?

Formas para obter a semente	<input checked="" type="checkbox"/> coluna aplicável
Usaram a semente armazenada que produziram no ano passado	
Foram oferecidas por vizinhos/familiares/amigos	
Trocaram com vizinhos/familiares/amigos	
Compraram de revendedores privados	
Compraram na estação de investigação	
Outro (especifique)	

Quem é o principal responsável pelas diferentes fases na **produção de arroz**?

(Escreva **1** para a principal pessoa e **2** pela pessoa adicional)

	Marido	Mulher	Filhos	Outros membros da família	Trabalhadores contratados
Preparação da Terra					
Preparação de viveiros de arroz					
Transplante					
Monda					
Colheita					
Debulha					
Secagem & armazenamento					
Venda					
Outro (especifique)					

2-1-5. Criação de animais

	Nr.		Nr.		Nr.		Nr.
Total de Gado		Vacas Leiteiras		Touros		Burros	
Galinhas		Patos		Perús		Patos da Guinéa	
Cabritos		Porcos		Outros(especifique)		Outros(especifique)	

2-1-6 .Maquinaria e equipamento Agrícola

Possui algum destes equipamentos?

	✓ se tem		✓ se tem		✓ se tem
Grade		Foice		Saco de Pulverizador	
Debulhadora manual		Carrinho de mão		Carroca Animal	
Charrua animal		Grade animal		Tractor de mão	
Bomba de água		Moinho de arroz		Outros (especifique)	

2-1-7. Utilização de Insumos agrícolas

Usou algum destes insumos agrícolas para a produção agrícola no ano passado? () Sim () Não

Se Sim, dê detalhes.

Insumos Agrícolas	✓ se usou	Para que cultura?	Quantidade usada / ha.	De onde obteve?	Custo por unidade (Mt)
Fertilizantes			Sacos / ha. / ha.		/
Insecticidas			/ ha. / ha.		/
Herbicidas			/ ha. / ha.		/
Sementes Certificadas			/ ha. / ha.		/
Fertilizantes Orgânicos			/ ha. / ha.		/
Outro (especifique)					

2-1-8. Mão de obra contratada

Contractou alguma mão-de-obra para a produção agrícola durante o ano passado (Abr. '08 - Mar. '09)?

() Sim () Não

Se Sim, para que cultura, para que tipo de trabalho, por quantos dias, e quanto pagou pela mão-de-obra?

Cultura	Trabalho feito pelos contratados(s)	Usaram alguma máquina/animal para o trabalho?	Nr de Homem X dia	Taxa diária (Mt) por pessoa	Outras coisas
		<input type="checkbox"/> Não foi necessário <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus próprios meios			
		<input type="checkbox"/> Não foi necessário <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus próprios meios			
		<input type="checkbox"/> Não foi necessário <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus próprios meios			
		<input type="checkbox"/> Não foi necessário <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus próprios meios			
		<input type="checkbox"/> Não foi necessário <input type="checkbox"/> concedi <input type="checkbox"/> os contratados usaram os seus próprios meios			

2-1-9. Problemas e Perspectivas na Actividade Agrícola

Qual é o principal problema da sua actividade agrícola? (✓ todas aplicáveis)

- () Falta de água para rega () Fertilidade dos solos () Falta de insumos
() Preços dos insumos muito alto () Pestes e doenças () Falta de informação técnica
() Falta de mão de obra () Falta de facilidades pós colheita () Canais de Mercado
() Dificuldade para transportar a produção () Secas/ Cheias () Outro (especifique)

Quais as perspectivas da sua actividade agrícola no futuro? (✓ todas aplicáveis)

- () Aumento da área de cultivo () Introdução da nova variedade
() Introdução de culturas mais rentáveis () Diversificação de Cultura () Mecanização
() Agricultura Orgânica () Agricultura Contratado () Outro (especifique)

2-2. Actividades Extra Machamba (durante o ano passado Abr. 08-Mar.09)

Algun membro da família tem um emprego fixo? () Sim () Não

Se Sim, o que faz? _____

Algun membro da família é negociante? () Sim () Não

Se Sim, que tipo de negócio tem?

() Loja () banca () Crédito () Outro (especifique) _____

Algun membro da família tem alguma indústria caseira/ artesanato? () Sim () Não

Se sim, dê detalhes na tabela que se segue.

Produtos	Fonte dos Materiais	Rota de Mercado
	1. Produz sozinho 2. compra na zona 3. compra nas lojas fora da cidade 4. Outro (Especifique)	1:Comerciante 2:Intermediario 3.Armazenista 4.Retalhista 5: Coops. 6.Auto venda 7: Outro (especifique)

3. Serviços de Apoio Agrário

3-1. Fontes de Informação sobre Técnicas Agrícolas (✓ no plural se necessário)

<input type="checkbox"/>	Não há informação disponível	<input type="checkbox"/>	Extensionistas	<input type="checkbox"/>	Familiares	<input type="checkbox"/>	Vizinhos	Outro (especifique)
<input type="checkbox"/>	Programa de Radio	<input type="checkbox"/>	Programa de TV	<input type="checkbox"/>	Vendedores de insu- mos agrícolas	<input type="checkbox"/>	Compradores	

3-2. Financiamento e Crédito à Agricultura

Recebeu algum crédito para a agricultura ano passado (Abr. '08-Mar. '09)? () Sim () Não

Se sim, dê detalhes na tabela que se segue.

Fonte de Crédito	Teve crédito de quanto? (Mt)	Taxa de juro (%/ano)	Período de Crédito (Mês(es))	Objectivo
	Mt			

3-3. Venda de Produtos

Como é que vende os seus produtos agrícolas?

Venda significa	Principais Produtos Agrícolas					
	Arroz	Milho	Hortícolas	(especifique)	(especifique)	Animais
Os Clientes vem e compram na sua machamba						
Transporta os produtos até ao comprador						
Vende na comunidade						
Vende no Mercado perto						
Vende no Mercado do distrito						
Outro (especifique)						

4. Economia familiar

4-1. Rendimento por machamba de todos os membros da Família (do ano passado desde Abr.'08 a Mar.'09)

Produtos vendidos	Quantidade para vendas (Nr. de sacos/caixas)	Preço por unidade (Mt por saco/caixa)	Despesas para vender (Mt por saco/caixa)
Arrozal (Total)			
Milho			
(especifique)			
(especifique)			
(especifique)			
Teve algum rendimento proveniente da animais e produtos pesqueiros? () Sim () Não			
Pprodutos vendidos	Quantidade para vendas (Nr.)	Preço por unidade (Mt)	Despesas para vender (Mt por unidade)
(especifique)			

(especifique)			
(especifique)			

4-2. Rendimentos Não-Agrícolas de todos os membros da família (Abr. '08-Mar. '09)

Já teve algum dos seguintes rendimentos no período que compreende entre (Abr. '08-Mar. '09)?

() Sim () Não

Itens	✓ se tiver o rendimento	Rendimento Periódico (Mt)	Frequência de rendimento	Total Anual (Mt)
Salário por emprego		/ Mês	Mês	
Rendimento do emprego fixo (trabalho agrícola, etc.)		/ Mês	Mês	
Salários de trabalho casual		/ Dia	Dias	
Auto emprego(lojas, fabrica, restaurantes, etc.)		/ Mês	Mês	
Venda de produtos caseiros/ artesanato		/ Mês	Mês	
Pagamentos pelo aluguer de terra		/ Época	Épocas	
Remessas		/ Ano		
Outro (especifique _____)				

4-3. Despesas correntes

Despendeu algum valor nos seguintes itens (Abr. '08-Mar. '09) ?

Itens		✓ aplicaveis	Se sim, Despesas Periodicas (Mt)	
1	Produtos alimentares	() Sim () Não () Não sei	/ □ dia □ semana □ mês □ ano	□ não sei quanto
2	Consumiveis diarios	() Sim () Não () Não sei	/ □ dia □ semana □ mês □ ano	□ não sei quanto
3	Despesas com electricidade	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
4	Educação (taxas e materiais)	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
5	Cuidados Medicos	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
6	Manutenção de casa e mobiliario	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
7	Ocasião Festiva & cerimoniais	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
8	Transporte & comunicação	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
9	Pagamento de Crédito	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
10	Taxas, direitos, contribuição, etc.	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
11	Depositos & poupanças	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto
12	Outro(especifique _____)	() Sim () Não () Não sei	/ □ mês □ ano	□ não sei quanto

Qual das despesas mencionadas acha que são muito pesadas para si ou para sua família? _____

(Indique o Nr. de serie na tabela)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**Preparatory Study for Rural Development/Economic Promotion
(with special emphasis on Rice Cultivation Promotion)
in
Mozambique**

- Preliminary Findings -

September 2009

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Appendixes

- I. Timetables of the Study
- II. Persons Interviewed

Abbreviations and Acronyms

AfDB	African Development Bank
AGRA	Alliance for a Green Revolution in Africa
APAC	<i>Associação de Promoção de Agricultura Comercial</i>
BID	Islamic Development Bank
CARD	Coalition for African Rice Development
CAIMOC	<i>Companhia Agro-Industrial de Moçambique Lda.</i>
CeLIM	Rural Development Project in Mopeia
DNC	National Directorate for Trade (of MIC)/ <i>Direcção Nacional de Comércio</i>
DNEA	National Directorate for Agricultural Extension/ <i>Direcção Nacional de Extensão Agrária</i>
DNSA	National Directorate for Agricultural Services/ <i>Direcção Nacional de Serviços Agrários</i>
DPA	Provincial Directorates for Agriculture/ <i>Direcção Provincial de Agricultura</i>
EU	European Union
EP-I	First stage of primary education
EP-II	Second stage of primary education
ESG-I	First stage of secondary education
ESG-II	Second stage of secondary education
FAO	Food and Agriculture Organization of the United Nations
FIL	Local Initiative Fund/ <i>Fundo Iniciativo Local</i>
GAPI	Office for Assistance to Small Industries/ <i>Gabinete de Apoio à Pequena Indústria</i>
GoM	Government of Mozambique
GPZ	Zambezi Valley Development Authority
HICEP	<i>Hidráulica de Chókwè E. P.</i>
IDA	International Development Association (of the World Bank)
IFAD	International Fund for Agricultural Development
IIAM	Institute of Agrarian Research in Mozambique/ <i>Instituto de Investigação Agrária de Moçambique</i>
INAM	National Institute of Meteorology/ <i>Instituto Nacional de Meteorologia</i>
INE	National Institute of Statistics/ <i>Instituto Nacional de Estatística</i>
IRRI	International Rice Research Institute
JICA	Japan International Cooperation Agency
MIA	<i>Mogfer Industrias Alimentares</i>
MIC	Ministry of Industry and Commerce/ <i>Ministério de Indústria e Comércio</i>
MINAG	Ministry of Agriculture/ <i>Ministério de Agricultura</i>
MOPH	Ministry of Public Works and Housing/ <i>Ministério de Obras Públicas e Habitação</i>
MSU	Michigan State University
MT	<i>metical</i> (plural: <i>meticais</i>)
NGO	Non Governmental Organization

NRDS	National Rice Development Strategy
O&M	Operation and maintenance
PAEI	Agrarian Policy and Implementation Strategy/ <i>Política Agrária e Estratégia de Implementação</i>
PAMA	Support to Agricultural Market Programme
PAPA	Action Plan for Food Production/ <i>Plano de Acção para a Produção de Alimentos</i>
PARPA	Poverty Reduction Strategy and Programme (PRSP)/ <i>Programa de Redução da Pobreza Absoluta</i>
PIDA	Integrated Agricultural Development Project
PROAGRI	Agriculture Sector Public Expenditure Program
SDAE	District Service of Economic Activities/ <i>Serviço Distrital de Actividades Económicas</i>
SEMOC	Mozambique Seed Company/ <i>Sementes de Moçambique</i>
SIDA	Swedish International Development Agency
SIMA	Agricultural Market Information System/ <i>Sistema de Informação de Mercados Agrícolas</i>
SMS	Short message service
SSIP	Small-scale irrigation project
TIA	Agricultural Survey/ <i>Trabalho Inquérito Agrícola</i>
TICAD	Tokyo International Conference on African Development
USAID	United States Agency for International Development
WFP	World Food Programme
WUA	Water Users Association

1. Introduction

1.1 Background and Objectives of the Study

Rice consumption in Mozambique has been rapidly growing, reaching about 25 kg per capita and a total of 550,000 tons in 2008. Rice is currently the third highest source of calories in the Mozambican diet after cassava and maize. While the importance of rice as a cash crop is also increasing due to the growing demand, the production of paddy remains at 196,000 tons (0.96 tons/ha) in 2006/07 and nearly 400,000 tons of rice are being imported. It is therefore deemed significant to examine effective measures for rice cultivation promotion. The increased rice productivity would also contribute to improving livelihoods of smallholder farmers who account for a major part of the agricultural sector of Mozambique.

The Japan International Cooperation Agency (JICA), in partnership with the Alliance for a Green Revolution in Africa (AGRA), launched an initiative “Coalition for African Rice Development (CARD)” on the occasion of the Fourth Tokyo International Conference on African Development (TICAD IV) held in Yokohama, Japan in May 2008. CARD is to support the efforts of African countries to double rice production in within 10 years, from 14 million tons in 2008 to 28 million tons in 2018. Mozambique has been selected as a country of the first group to be supported by CARD and thus prepared the National Rice Development Strategy (NRDS) in February 2009.

Based on this background, JICA has decided to conduct a study for the purpose of formulating a comprehensive program for cooperation with the Government of Mozambique (GoM) in rice cultivation promotion. Specific objectives of the study are as follows.





- 1) Investigate the present situation of rice cultivation and related areas such as agricultural policy, rural society, infrastructure, marketing and support services (e.g., research and extension) and identify key issues for rice development
- 2) Grasp the conditions of rice growers such as farm management, income and expenditure, social structure and farmers’ organizations through field visits and surveys in the Provinces of Maputo, Gaza, Sofala, Zambézia, Nampula and Cabo Delgado
- 3) Propose to and discuss with GoM and other stakeholders a possible program for cooperation in rice cultivation promotion.

1.2 Methods and Areas of the Study

The study is conducted in Japan and Mozambique in late July – early October 2009 through the review of relevant documents, interviews and discussions with officials of the central, provincial and district governments and field visits in the above-mentioned six provinces. In particular, the present situation of rice farmers and their surroundings in the Chókwè and Nante irrigation schemes in the Provinces of Gaza and Zambézia, respectively, were surveyed as case studies by using a set of questionnaire.

The overall work schedule of the study is shown in Section 3 below and a more detailed timetable in Appendix I.

1.3 Overall Work Schedule

Tasks	2009			
	July	Aug.	Sept.	Oct.
1) Investigation of the present situation of rice cultivation and related areas	<input type="checkbox"/>			
2) Grasp of the conditions of rice growers through field surveys				
3) Preparation of interim report (including a draft program for cooperation in rice cultivation promotion)				
4) Discussion on the draft program for cooperation in rice cultivation promotion				
5) Preparation of final report				<input type="checkbox"/>

 Work in Mozambique Work in Japan

1.4 Members of the Study Team

Members	Affiliation
Dr. Kunihiro TOKIDA Team Leader	Senior Advisor, Rural Development, JICA (Head Office)
Ms. Keiko MIZOE Cooperation Planning	Program Officer, Southern and Eastern Africa Division, Rural Development Department, JICA (Head Office)
Ms. Satoko EMOTO Agricultural Economy/Marketing/Policy (consultant)	Senior Economist, International Development Center of Japan
Dr. Kiyoko HITSUDA Rice Farming/Farm Management (consultant)	Senior Consultant, Consulting Division, Japan Development Service Co. Ltd.
Ms. Keiko ITAGAKI Rural Society (consultant)	Researcher, Social Development Department, Global Link Management
Mr. Koji OKADA Irrigated Agriculture Development/Water Resources (consultant)	Irrigation and Drainage Engineer, Agriculture and Rural Development Department, Nippon Koei Co. Ltd.
Mr. Joaquim Tembe Interpreter	
Ms. Jacklin Timane Interpreter	

The names and positions of those whom the study team interviewed at central, provincial, district and field levels are indicated in Appendix II.

2. Overview of Mozambique's Agricultural Sector

2.1 Importance of Agriculture in Mozambique's Economy

Mozambique's GDP grew at the average rate of 7.8% between 1992 (the end of the civil war) and 2006 (Figure 2.1). This remarkable achievement is attributed to a high degree of political stability with prudent and stable economic policy continuity, as well as to efficient use of substantial international development assistance with good coordination. Furthermore, the growth has been pro-poor, accompanied by a significant decrease in poverty levels, with the poverty headcount index declining from 69.4% in 1996-97 to 54.1% in 2002-03.¹

While agriculture has seen above average growth rates for the region in the last decade (5.3% in 1997–2007), its share in total output has decreased from 34.9% in 1997 to 27.6% in 2007.² While services' share of total GDP has decreased slightly, industry (particularly gas and electricity and construction sectors) has experienced significant growth with its share increasing from 17.8% in 1997 to 25.7% in 2007. However, agriculture is still important in Mozambique's economy, because about 65.5% of the total population or 13.4 million people live in rural areas and 70% of rural livelihoods are tied to agriculture as of 2005. The sector is also the key to addressing the problem of mass poverty, i.e., 55.3% of the rural population still lived in absolute poverty in 2002-03.³

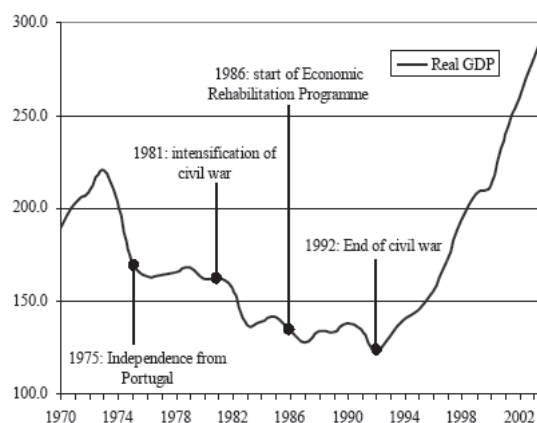


Figure 2.1: Mozambique Real GDP 1970–2004 (billions of metical at constant 1980 prices)

Source: Arndt, C., S. Jones and F. Tarp, Aid and Development: The Mozambican Case, Discussion Paper No. 27E, Ministry of Planning and Development, May 2006. As cited in World Bank, *Mozambique Investment Climate Assessment*, May 2009, p. 1.

2.2 Major Characteristics of Mozambique's Agriculture

Mozambique has 36 million ha of potentially arable land, of which only 5.7 million ha, or less than 16%, is actually cultivated.⁴ While the country has considerable untapped opportunities for irrigation, its total irrigated area is less than 0.3% of the total arable land. Smallholder farmers account for 99% of all rural households. They are mostly subsistence, dependent on rainfed production and thus highly vulnerable to droughts and floods. Under these conditions intercropping and rotational cropping systems are widely practiced to secure food and cash income.

Mozambique's agricultural productivity is the lowest among countries in the region such as Malawi, Tanzania and Zambia.⁵ The Agricultural Survey (Trabalho Inquérito Agrícola: TIA) conducted annually by the Ministry of Agriculture (MINAG) has revealed that the use of modern inputs and mechanization by smallholder farmers is very limited; less than 5% use

¹ Republic of Mozambique, PAPRA II, May 2, 2006, p. 10.

² World Bank, Mozambique at a glance, 09/24/2008.

³ Republic of Mozambique, op. cit.

⁴ For the arable land area, World Bank, *Mozambique Agricultural Development Strategy: Stimulating Smallholder Agricultural Growth*, February 23, 2006; and for the area cultivated, Ministry of Agriculture, *Trabalho Inquérito Agrícola (TIA) 2007*.

⁵ World Bank, *Mozambique Agricultural Development Strategy*, op. cit., p. 2.

fertilizers or pesticides and around 12% use animal traction.⁶

The country can be broadly divided into three geographical regions with a wide variety of regional cropping patterns as shown in Table 2.1. While rice is an important food crop in the central and northern regions, its share of total food production is small as compared with cassava and maize as indicated in Table 2.2.

Table 2.1: Agroecological Conditions and Regional Crop Production Patterns

Category	Northern Zone	Central Zone	Southern Zone
Province	Niassa, Cabo Delgado and Nampula	Zambézia, Tete, Manica and Sofala	Inhambane, Gaza and Maputo
Annual rainfall (mm)	1,000 – 1,800	1,000 – 1,200	400 – 1,000
Main food crops	Cassava, maize, rice, sorghum, sweet potatoes, beans	Cassava, sweet potatoes, maize, rice, beans, sorghum, millet	Cassava, maize
Main cash crops	Tobacco, cotton, cashew, groundnuts	Tobacco, cotton, groundnuts, horticulture	Only limited agricultural production
Livestock	Large pasture areas in Tete Province	Pasture areas in Sofala	Pasture areas with rural population raising cattle and goats

Source: World Bank, Mozambique Agricultural Development Strategy, February 23, 2006, p. 6.

Table 2.2: Food Crop Production for Small- and Medium-size Farms by Province, 2007 (1,000 tons)

Crop	Niassa	Cabo Delgado	Nampula	Zambézia	Tete	Manica	Sofala	Inhambane	Gaza	Maputo	Total
Maize	104	86	94	229	212	212	97	29	61	11	1,133
Rice	3	12	10	62	0	2	11	2	2	0	103
Sorghum	8	18	21	14	22	44	36	3	1	--	169
Millet	1	0	2	3	11	2	4	0	2	--	25
Feijão manteiga	16	0	4	15	12	3	1	0	3	0	55
Feijão nhemba	1	12	20	6	5	3	2	9	3	1	62
Cassava	88	45	1,144	2,322	24	171	123	442	156	42	4,959
Sweet potatoes	20	8	9	205	288	178	74	7	56	15	861

Source: Ministry of Agriculture, Trabalho Inquérito Agrícola (TIA) 2007.

2.3 Agricultural Policy and Development Strategy

The current policy framework for the agricultural sector includes the overall Government Five-Year Program (2005-09), the Action Plan for the Reduction of Absolute Poverty 2006-2009 (PARPA II), and the Agricultural Policy and Implementation Strategy 1997 (PAEI). The objectives of the Government Program for the agricultural sector and rural development include reduction of absolute poverty through actions in agriculture and rural development. The main government guidelines for the sector are expressed in PAEI, where agricultural activities fit into the country's development objectives towards four main areas: 1) food security, 2) sustainable economic development, 3) reduction of the unemployment rate and 4) poverty reduction. PARPA outlines the national strategic vision for reducing poverty, main objectives, and key actions, all of which inform the preparation of the state's medium-term and annual budgets, programs and policies, including sector programs.

Within the policy framework, MINAG has been implementing programs and action plans for agricultural development. Major on-going programs are as explained below.

(1) Agriculture Sector Public Expenditure Program (PROAGRI)

⁶ Ministry of Agriculture, op. cit.

PROAGRI I was implemented in a sector-wide approach in 1999-2004. As one of sector programs under PARPA, it had a broader perspective to improving agriculture so as to play the role of providing for rural households the necessary means to pursue the goal of reducing poverty and food insecurity. The five-year program funded by over 16 donors had a budget of more than US\$200 million to finance activities within eight components: institutional development, livestock, forestry and wildlife, extension, research, land, irrigation and crop production. The program placed much emphasis on institutional reform and capacity development, as well as decentralization of planning and implementation.

Following PROAGRI I, MINAG formulated PROAGRI II in 2004 for the implementation period of 2006-2010. PROAGRI II's five pillars are: 1) markets; 2) financial services; 3) technology; 4) access to natural resources; and 5) enabling business environment. PROAGRI II continues to address the need to strengthen the public sector's capacity to: 1) undertake institutional reform and human development; 2) improve infrastructures and farmers' ability to access to and compete in the market, and 3) manage risks, particularly natural disasters, and input and output market fluctuations associated with hunger and food insecurity

(2) Action Plan for Food Production (PAPA) 2008-2011

In response to the sharp rise in global food and oil prices, GoM approved PAPA in June 2008 as an implementation agenda of the Strategy for Green Revolution formulated in 2007. The total planned budget for PAPA is MT 15.9 billion, or US\$572 million, for the period of 2008/09-2010/11.⁷ PAPA seeks to substantially increase productivity and production of all key commodities within the three-year period in order to reduce dependency on food imports. PAPA's target commodities are maize, rice, wheat, cassava, potatoes, oilseeds (sunflower seeds, soybean, cotton seeds and groundnuts), chicken and fish, among which the highest projection is for rice with the production to be more than tripled within three years (Table 2.3). The plan is envisaged to tackle all issues existing in the value chains of food production, i.e., cultivation, harvesting, storage, processing and marketing (including export markets).

Table 2.3: Production projected by the Green Revolution Strategy and Estimated Marketed Quantity (tons)

Commodities	2008/09		2009/10		2010/11	
	Production	Marketed	Production	Marketed	Production	Marketed
Maize	1,854,062	556,219	1,994,142	598,243	2,245,907	673,772
Rice (paddy)	265,098	79,529	576,730	173,019	931,844	279,553
Wheat	21,300	21,300	46,313	46,313	96,750	96,750
Sunflower seeds	5,000	5,000	12,000	12,000	21,000	21,000
Soybean	27,000	27,000	50,000	50,000	92,000	92,000
Groundnuts	186,386	139,790	202,500	151,875	217,503	163,127
Chicken	47,364	42,628	51,616	46,454	61,290	55,161
Potatoes	119,024	107,122	180,308	162,277	279,308	251,377
Cassava	9,576,292	653,363	9,960,551	665,971	10,732,344	736,394
Total	12,101,526	1,631,950	13,074,160	1,906,152	14,677,946	2,369,135

Source: República de Moçambique, *Plano de Acção para a Produção de Alimentos 2008-2011*, 11 Junho 2008, p. 45.

⁷ República de Moçambique, *Plano de Acção para a Produção de Alimentos 2008-2011*, 11 Junho 2008, p. 61.

3. Present Situation of the Rice Sector of Mozambique

3.1 Rice Supply and Demand in Mozambique

While rice production has long stagnated since the 1990s, rice import has rapidly increased since the early 2000s, reaching 425,600 tons, or US\$127.5 million, in 2007 (Table 3.1 and Figure 3.1).⁸ Per capita consumption also increased from less than 10kg in the 1990s to 22kg in 2007, which suggests that rice is becoming a staple of the Mozambican diet. The quantity imported plummeted in the latter half of 2008 due to the global market situation in which prices of all major grains, particularly rice, sourced to record highs (Figure 3.2). However, the increasing tendency of demand for rice in Mozambique appears to continue as the quantity imported has already recovered to the level of previous years in early 2009.⁹

Table 3.1: Rice Supply and Demand in Mozambique in 1994-2007 (1,000 tons)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Area harvested*	121.3	129.6	144.0	165.3	181.0	186.1	184.2	155.0	172.6	179.0	178.6	180.0	160.0	165.0
Yield**	0.8	0.9	1.0	1.1	1.1	1.0	1.0	0.6	0.7	1.1	1.0	1.0	0.6	0.6
Production: paddy	101.2	113.0	139.0	180.2	191.0	186.1	180.8	93.4	117.5	200.4	177.4	174.0	99.2	104.7
Seeds: paddy	10.4	11.5	13.2	14.5	14.9	14.7	12.4	13.8	14.3	14.3	14.4	12.8	13.2	13.2
Supply: paddy	90.8	101.5	125.8	165.7	176.1	171.4	168.4	79.6	103.2	186.1	163.0	161.2	86.0	91.5
Supply: rice	54.5	60.9	75.5	99.4	105.7	102.8	101.0	47.7	61.9	111.7	97.8	96.7	51.6	54.9
Import (volume)	60.8	90.0	53.3	44.8	48.7	34.0	70.0	31.5	76.0	159.4	262.6	259.3	382.3	425.6
Import (value)***	19.0	31.0	21.0	13.2	16.5	10.3	21.2	9.5	13.6	30.2	49.4	67.5	96.3	127.5
Export (volume)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.3
Export (value)***	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Total consumption	115.3	150.9	128.8	144.2	154.4	136.8	171.0	79.2	137.8	270.9	360.1	356.0	433.9	480.2

Data source: FAOSTAT (<http://faostat.fao.org/>). Crop statistics updated on June 23, 2009 and TradeSTAT updated on August 12, 2009 (both accessed on September 4, 2009).

Notes: Numbers includes calculated, estimated by FAO and unofficial data. * = (1,000 ha); **=ton/ha; and ***=US\$ million.

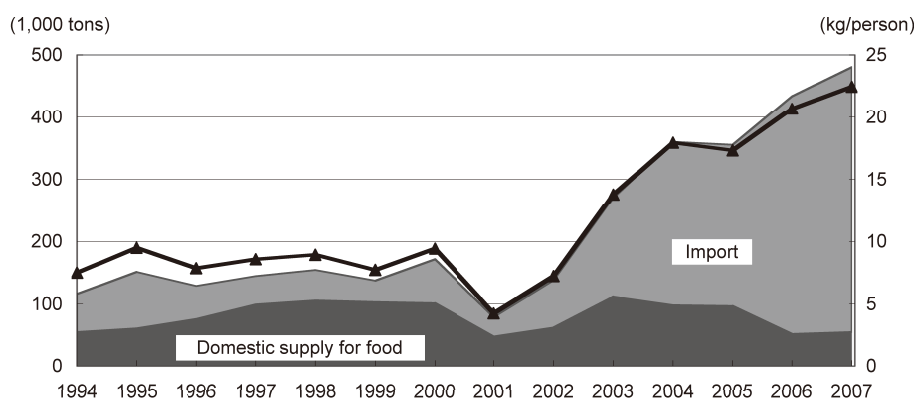


Figure 3.1: Domestic Supply, Import and Per Capita Consumption of Rice in Mozambique in 1994-2007

Data source: FAOSTAT (<http://faostat.fao.org/>). Crop statistics updated on June 23, 2009, TradeSTAT updated on August 12, 2009 and PopSTAT updated on February 10, 2009 (accessed on September 4, 2009).

While the trend of rice import should be further analyzed, it does not seem to be an immediate threat to national-level food security. However, it would be significant to take action to enhance household-level food security of subsistence farmers in areas where only rice can be cultivated and of the urban poor who tend to buy cheaper rice due to the relatively higher prices for maize flour in recent years. It would also be important from a long-term perspective, considering the country's enormous potential for rice development.

⁸ These numbers are obtained from FAOSTAT (<http://faostat.fao.org/>) as a complete data set, particularly on trade, was not available at the time of this report preparation.

⁹ Data obtained from the National Directorate of Commerce, Ministry of Industry and Commerce.

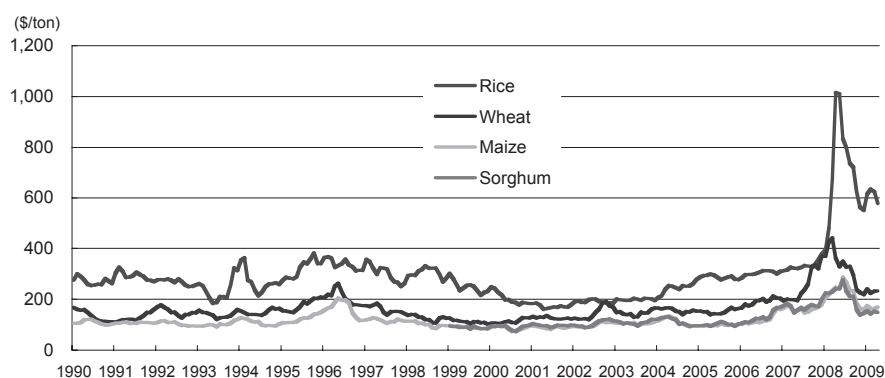


Figure 3.2: Global Prices of Major Agricultural Products (January 1990 - April 2009)

Data source: IMF, Primary Commodity Prices (<http://www.imf.org/external/np/res/commod/index.asp>); and for sorghum, FAO, Food Price Indices (<http://www.fao.org/worldfoodsituation/FoodPricesIndex/en/>).

Notes: Rice - 5% broken, nominal price quote, fob Bangkok
 Wheat - U.S. No.1 Hard Red Wheat, fob Gulf of Mexico
 Maize - U.S. No.2 Yellow, fob Gulf of Mexico
 Sorghum - U.S. No.2, Yellow, fob Gulf of Mexico.

3.2 Policies and Programs related to Rice Development

(1) Action Plan for Food Production (PAPA): Rice Production Program

Rice is one of PAPA's focuses as highlighted in Section 2.3 above. Rice production is expected to increase from 265,098 tons in 2008/09 to 931,844 tons in 2010/11 (Table 3.2). The increase is brought about mainly by intensification. Main interventions to attain the target are: 1) provision of certified seeds and other inputs for rainfed production; and 2) provision of technological packages including certified seeds, fertilizers and irrigation systems for intensive production. Total planned costs amount to US\$173 million for the three years.

Table 3.2: Expected Rice Production by PAPA in 2008/09-2010/11

	2008/09	2009/10	2010/11
Area with intensification (ha)	22,000	115,000	210,000
Area rainfed (ha)	209,301	121,630	33,000
Total Area (ha)	231,301	236,630	243,729*
Production with intensification (tons)	53,000	355,000	687,000
Production rainfed (tons)	212,098	221,730	244,844
Total production (paddy) (tons)	265,098	576,730	931,844
Total production (rice) (tons)	159,059	346,038	559,106
Consumption (tons)	552,475	566,287	580,444
Deficit (tons)	-393,416	-220,249	-21,338
Budget for production units (MT million)	48	252	300
Credit (MT million)	274	1,285	1,992
Total (MT million)	322	1,537	2,292
Total (US\$ million)	13.4	64.0	95.5

Source: República de Moçambique, *Plano de Acção para a Produção de Alimentos 2008-2011*, Versão do dia 11/Junho 2008, p. 13.

*: Not equal to the sum of the two numbers above but as indicated in the PAPA document.

Based on the Green Revolution Strategy, PAPA has set 19 priority districts nationwide for rice production promotion (Table 3.3). The study team visited 15 of them during the present field study and has found that there are irrigation schemes, most of which are not operational or require substantial rehabilitation, in all the 15 districts. However, some of the priority districts seem to have been selected merely because of the presence of irrigation schemes without making an analysis of the economic and technical feasibility of rehabilitation.

Table 3.3: Priority Districts for Rice Production Promotion by PAPA

Province	Districts
South Zone:	
Maputo	Matutuine*, Manhiça*
Gaza	Chókwè*, Xai-xai*, Bilene, Mandlakaze
Central Zone:	
Sofala	Dondo*, Búzi*, Beira*
Zambézia	Nicoadala*, Morrumbala*, Chinde, Mopeia*, Namacura*, Maganja da Costa*, Inhassunge
Northern Zone:	
Nampula	Angoche*
Cabo Delgado	Muidumbe (N'guri)*, Balama (Chipembe)*

Source: República de Moçambique, Plano de Acção para a Produção de Alimentos 2008-2011, 11 Junho 2008, p. 14.

*: Districts visited by the JICA study team.

(2) National Rice Development Strategy (NRDS)

GoM has prepared NRDS in February 2009 and presented it at the second conference of the Coalition for African Rice Development (CARD) held in Tokyo in early June 2009. NRDS is based on the Green Revolution Strategy and PAPA, and formulated as a ten-year program to boost rice production, meet domestic demand and even generate exportable surpluses. The program is thus no less ambitious than PAPA, i.e., rice production is projected to increase five times for the period from 2008 to 2018 (Table 3.4). The increase is expected to come mainly from intensification, i.e., rehabilitation and construction of infrastructure, particularly irrigation facilities, and provision of improved seeds and other inputs.

Table 3.4: Indicative Projection of Rice Production and Consumption by NRDS in 2008-2018

	2007	2008	2013	2018
Area (ha)	204,031	231,301	352,769	389,485
Yield (ton/ha)	0.96	1.15	2.90	3.50
Production (paddy) (tons)	195,967	265,098	1,023,030	1,363,199
Milled Rice (tons)	117,580	159,059	613,818	817,919
Consumption (tons)	--	552,475	625,075	707,215
Deficit/Surplus (tons)	--	-393,416	-11,257	110,705

1. These projections reflect the official data on PAPA approved by the Cabinet.
2. This approach anticipates closing the gap (consumption vs. production) in 7 years.
3. There is need to show the coherence between area increase with the necessary effort in terms of resources to achieve this goal.
4. These calculations imply an area increase of 191% in 10 years of which: 13% (2008/2007); 2%/years (2009/2008) onwards.
5. The calculations show projection on yields of 364% in 10 years and more than double production in 3 years (the CRDS's goal).
6. The calculations show production increase of 668% over 10 years.

Source: Republic of Mozambique, Ministry of Agriculture, National Rice Development Strategy, Mozambique February 9, 2009.

Notes by the JICA study team:

- 1) The data for 2007 are taken from the NRDS document.
- 2) The above six original notes need to be re-examined as they are not consistent with the numbers in the table.

Major observations on NRDS by the JICA study team are as follows.

- 1) Although a vision, goal and strategic objective are presented in the document, the main goal or objective of NRDS is not clear; i.e., whether it is to improve the livelihoods of smallholder rice growers, to enhance household-level food security of poor rice producers and consumers, to reduce rice import bills, or to expand rice production for export. Different approaches should be taken, depending on the goal or objective. If the objective is to increase rice production to such a high level as projected, for example, the approach

might be oriented towards more commercial production on a medium- to large-scale. If it is to enhance food security of subsistent rice growers, strategic emphasis should be placed on more stable rice production in intercropping and rotational cropping systems.

- 2) The production target, more than five-fold increase in ten years, does not seem to be realistic, judging from the past trend of rice development. In particular, it is supposed to expand the irrigated area by 188,000 ha in three years while the current irrigated area actually planted with rice is estimated to be around 4,000 ha.¹⁰ The introduction of water pumps may not be efficient since they would eventually require higher costs for operation and maintenance, as well as for replacement in 10-15 year's time. It may also be difficult to realize the planned production of pre-basic and basic seeds of improved varieties due to the limited capacity of the Institute of Agrarian Research of Mozambique (IIAM) in rice research, albeit the International Rice Research Institute (IRRI) may bring more resources.
- 3) Some calculations seem incorrect or are inconsistent with the explanations presented in the document.
- 4) As regards research:
 - The national strategy to establish a rice research system should be formulated;
 - The national strategy to foster researchers should be put forward;
 - The survey on local rice varieties should be planned;
 - Characteristics of rice plant required in each agro-ecosystem should be identified; and
 - Breeding rice varieties appropriate to each agro-ecosystem should be planned.
- 5) As regards rice farming and farm management:
 - Rice farming pattern in the country should be categorized;
 - Issues to be improved in each farming category should be put forward;
 - Operation strategy in each category should be made;
 - Farming categories to be empowered should be prioritized;
 - Issues to be held by concerned sectors should be put forward;
 - The required activities in each sector should be affirmed;
 - The time schedule of each activity should be made; and
 - A monitoring and evaluation system of the operation should be established.
- 6) As regards extension:
 - Preparation of farming manuals of each farming pattern should be planned;
 - Training of extension workers should be planned; and
 - Program to foster facilitators in villages should be prepared.
- 7) As regards rice seed production:
 - Establishment of certified seed production and the inspection system
 - Establishment of certified seed supply system

In conclusion, NRDS, as well as PAPA, should be scrutinized so as to make it a more realistic program. The re-formulation work should include a more thorough analysis of the present situation (including the global and domestic rice markets since 2005 when the Italian government assisted GoM in conducting a study on the competitiveness of Mozambique's rice sector¹¹), policy analysis, goal setting, identification of appropriate approaches and interventions, effective institutional arrangements and cost estimates.

¹⁰ Based on FAO's estimate. For more details, see Section 4.

¹¹ Prepared for the Cooperazione Italiana by Agrifood Consulting International, *Development Strategy for the Rice Sector in Mozambique: Trade, Market Potential and Competitiveness of Mozambican Rice*, August 2005.

3.3 Measures and Support for Rice Development

3.3.1 Support Services related to Rice Development

This section reviews major agricultural support services existent in Mozambique and highly relevant to rice development.

(1) Research

The Institute of Agrarian Research of Mozambique (IIAM) has been established since 2004, integrating five institutes of specified areas (agronomy, animal production, veterinary, rural development, and forestry), and it has four zone centers; Southern Zone Center (Chókwè, Gaza Province), Central Zone Center (Sussundenga, Manica Province), Northwestern Zone Center (Lichinga, Niassa Province), and Northeastern Zone Center (Nampula, Nampula Province). Rice research is implemented in collaboration with IRRI, which provides foundation seeds. IIAM has designated the Southern Zone Center and the Quelimane Branch of Northwestern Zone Center as its strongholds in rice research.

IRRI has an office in Maputo, the East and Southern African Regional Office, and has implemented a breeding program to improve rice production in rain fed and irrigated fields, focused on seven southwestern African countries (Mozambique, Tanzania, Uganda, Kenya, Burundi, Rwanda and Malawi). The research target is the release of new varieties resistant to diseases with double yield compared to local ones by 2011. Moreover, IRRI supports the settlement of a Rice Knowledge Bank by IIAM.

Moçfer Industrias Alimentares (MIA) has experimental fields in Chókwè and Matuba, Gaza Province, with three researchers working on rice variety adoptability, rice breeding and the finding of suitable second crops after rice cultivation.

Research information on rice is seldom exchanged by the concerned organizations.

(2) Extension

The National Directorate of Agricultural Extension (DNEA), Ministry of Agriculture, has settled an extension station at the District Service of Economic Activities (SDAE) in each district and has deployed a total of 671 extension workers in 127 districts in 2009 (only one district has no extension worker). DNEA plans to increase it to 1,052 workers by 2010. Nevertheless, the number is still too small to serve the farmers in the whole country. The Ministry has started providing extension workers means of transport, aiming to provide one motorbike per person since 2008. Supply of working tools, uniforms, boots, portable sprayers, measures, etc., has been planned, too. Manuals of specific aspects have been prepared to facilitate extension services.

(3) Seed Production

MIA has started rice seed multiplication in the Chókwè experimental station and sold them to contract farmers since 2007. It also sells rice seeds to the Ministry of Agriculture, which has been implementing PAPA since 2008. The seeds were then distributed by the Ministry to the farmers through SDAEs that received the seeds from the provincial government. As a supplement to the supplied seeds, some provincial governments buy quality seeds directly from seed-producing farmers.

Mozambique Seed Company (SEMOC), which also buys quality seeds from seed-producing farmers, sell their seeds to provincial governments through PAPA, or directly to individual farmers. The provincial governments distribute their seeds to farmers, who store them for future needs.

Some farmers associations sell a part of their produce as rice seeds directly to individual farmers or to SEMOC.

(4) Rural Finance

According to the World Bank report cited earlier, lack of rural finance in Mozambique is pervasive even by African standards.¹² The situation is due to structural factors such as: 1) a predominance of low-input/low-output subsistence farming; 2) the extensive poverty level; 3) the low population density in large parts of the country; 4) agriculture frequently affected by droughts and floods; 5) high and volatile real interest rates; and 6) long years of civil war. As a consequence, there has been little supply of and demand for rural financial services and virtually no commercial bank presence in rural areas. The existing services are directed only to large-scale farmers, large traders and processors. Loans have high minimums, e.g., US\$10,000. The attempts of the government and donors to establish rural finance have so far had only a marginal impact. Some successful cases can be found only in informal and community-based microfinance, often assisted by NGOs (e.g., CARE, IRAM, etc.)

(5) Market Information Services¹³

In the public sector, there are two major market information systems, i.e., the Agricultural Market Information System (SIMA) operated by the Directorate of Agricultural Economy, MINAG, and INFOCOM by the National Directorate of Commerce, Ministry of Industry and Commerce (MIC). These systems are mainly oriented for trade promotion.

SIMA was created in 1991 initially as part of the food security project technically assisted by the Michigan State University (MSU) and funded by USAID and has been institutionalized into MINAG and fully funded by GoM since 2000/01. When the country's economic policy changed towards free-market economy, emerged a need to: 1) have a database on prices in different locations; 2) support the strengthening of market transactions; and 3) monitor the impact of markets on food security. SIMA currently covers 25 markets in 10 provinces, including provincial capitals and at least one district per province with high potential in terms of production and trade. Data are weekly collected on prices (producer, wholesale and retail), availability, product flows and transport costs of products with high potential for trade and critical to food security (i.e., maize, rice,¹⁴ groundnuts, beans, cassava, sweet potato and Irish potato, maize and wheat flour, edible oil and sugar) by district enumerators and project national staff contracted by MSU and since 2000/01 by the government. Operating costs are approximately US\$150,000 per annum.

¹² World Bank, *Mozambique Agricultural Development Strategy: Stimulating Smallholder Agricultural Growth*, op cit., p. 49.

¹³ Based on Lara Carrilho (WFP Mozambique) and António Paulo (SIMA/MINAG), Market Information Systems and Partnerships in Mozambique, presentation at the Workshop on Partnerships in Market Analysis for Food Security, 11 – 13 December 2007, Johannesburg, South Africa; and an interview with Mr. António Paulo, Coordinator of SIMA conducted by the JICA study team on September 11, 2009.

¹⁴ Rice is included in SIMA, but price information is available only on imported rice because domestically grown rice is not available in the market throughout the year.

SIMA's products include: 1) *Quente-Quente* (weekly national market bulletin), which is the only regular source of national information on local agricultural products, and regional and international markets of maize, soybean, wheat and sunflower; 2) Monthly provincial systems and bulletins in five provinces with the geographical and local products coverage increasing; 3) Annual survey on market dynamics in May-June with perspectives of agricultural marketing by rural traders – Flash (*Inquérito de Janela* = windshield survey); 4) Special studies when needed/requested; and 5) Database on commodity prices and flows, transport costs, which are widely used by GoM's ministries, international agencies, universities, consultants and the private sector. Means of dissemination are e-mail, fax, radio, *Jornal Noticias*, website (www.sima.minag.org.mz) and SMS (forthcoming).

INFOCOM by MIC is a weekly bulletin on prices. Data are collected in 66 supermarkets and stores in provincial capitals on products for human consumption including raw and industrial products: fish, eggs, sugar, maize meal and rice. The annual bulletin (special edition) includes a projected food balance sheet at national and sub-national (north, central and south) levels for maize, wheat, rice, sorghum and millet, cassava and other roots, beans and groundnuts. The system has been supported by FAO and fully funded by GoM since 2007.

Other sources of agricultural market information include: 1) Cross Border Trade Monitoring by WFP/FEWSNET; 2) SETSAN/VAC annual assessments; 3) WFP-SENAC/MINAG market study 2005 for local procurement; 4) WFP Community and Household Survey (WFP bi-annual food security monitoring system) with qualitative market data obtained from sampled rural communities; 5) PAMA's (the Support to Agricultural Market Programme) baseline and support to farmers organizations and rural traders of northern provinces to encourage information sharing.

3.3.2 Support for Rice Development by External Funds

AfDB, the World Bank/IDA, Islamic Development Bank (IDB), EU and some bi-lateral co-operation of Japan, Italy, Sweden have been assisted rice related projects in the country as shown in Table 3.5.

AfDB is supporting smallholder farmers by developing small-scale irrigation (SSIP) in Maputo, Sofala and Manical provinces. It also rehabilitated an irrigation scheme as well as the Massingir dam and reservoir in the upstream area which were damaged with the devastating flood in 2000. The World Bank has been assisting rural farmers and private entrepreneurs related to the rice sector in improving their livelihood by developing their capacity and value chain through irrigated agriculture promotion in Sofala and Manica Provinces. IDB has supported to rehabilitate the secondary and tertiary canals and training of water users associations in the Chókwè scheme in Gaza.

EU is supporting rural farmers in the southern area where drought is a problem by rehabilitating small scale irrigation infrastructure and developing capacity of government staff and farmers. EU, together with IFAD, Ireland, Canada, Sweden, Finland, Austria, and Denmark, has been assisting the Government of Mozambique in implementing agriculture sector development through common basket fund, to develop ownership of Mozambique Government and strengthening of its planning and institutional capacity.

Swedish International Development Agency (SIDA) has been implementing basin-wide water development including irrigation, at a trans-boundary river basin in Sofala and Manica

provinces. Italian Government assisted in developing national rice development strategy, which identified four rice clusters as priority for rice production. It also supported rice farmers by developing irrigation and providing training on production and marketing (PIDA) in Maputo, Sofala and Manica provinces. JICA is supporting rice farmers to increase the productivity by transferring new crop management technique under irrigation in the Chókwe scheme in Gaza.

Table 3.5: Projects implemented by External Assistance

Prov.	Name of Project	Irrigation command area (ha)	Executing agency	Fund source	Estimated Project cost	Nature of work	Major works	Implementation period
Maputo	Integrated Agricultural Development Project (PIDA)	na	na	Italy	EUR 2.5 million for whole PIDA	Extension & training, Production, marketing, Irrigation		Completed in 2007
	Small Scale Irrigation Project (SSIP)	1,600 ha in total SSIP	Ministry of Agriculture	AfDB, etc	USD 20.5 million in total	Extension & training, Production, Irrigation	inc. establish motor pump, rehabilitate access roads, credit	1999 - 2010 (On going)
Gaza	Rehabilitation of secondary and tertiary canals of the Chokwe Irrigation Scheme		HICEP	BID (Islamic Bank, Grant)	USD 12.87 million	Irrigation	rehabilitation of secondary and tertiary canals ad training of WUAs	Approved (started in 2008)
	The Integrated Agricultural Development Project for Small Scale Farmers in Chókwe Irrigation Scheme	two model farms	JICA with National Agricultural Research Organization (NARO)	JICA (Technical cooperation)	USD 3.35 million	Multi fields relating irrigated agriculture		2007 - 2010 (On-going)
	Massingir Dam and Smallholder Agricultural Rehabilitation Project (Sup. Loan)	5,000 ha	National Directorate of Water (DNA)	AfDB, etc	USD 28.46 million (supplementary loan)	Production, Irrigation, Others	rehabilitation of dam and irrigation and drainage systems in Xai Xai area, construction of feeder roads	2006 - 2010 (On-going)
	Drought Mitigation Plan for Gaza and Inhambane		MINAG	EU	EUR 10 million	Extension & training, Production, Irrigation	rehabilitation and construction of existing small scale water infrastructure	Pipeline (not decided)
Sofala	Sustainable Irrigation Development Project (PROIRRI)	5,000 ha	Ministry of Agriculture, National Directorate of Agrarian services	WB	USD 50 million	Extension & training, Production, Marketing, Post harvest, Irrigation, etc.	inc. Irrigation system and support infrastructures (2,500 ha for rice, 2,000 ha for horticulture and 500 ha for out growers)	Approved (2010 - 2016)

Prov.	Name of Project	Irrigation command area (ha)	Executing agency	Fund source	Estimated Project cost	Nature of work	Major works	Implementation period
	Market-led smallholder development in the Zambezi Valley Project	na	Ministry of planning and Development	IDA (loan), GEF (Grant)	USD 26.7 million	Extension & training, Production, Marketing, Post harvest	incl. small gravity irrigation schemes	2007-2013
	Small Scale Irrigation Project (SSIP)	1,600 ha in total SSIP	Ministry of Agriculture	AfDB, etc	USD 20.5 million in total	Extension & training, Production, Irrigation	inc. establish motor pump, rehabilitate access roads, credit	1999 - 2010 (On going)
	Integrated Agricultural Development Project (PIDA)	na	na	Italy	EUR 2.5 million for whole PIDA	Extension & training, Production, marketing, Irrigation		Completed in 2007
Zambezia	Project for the Rice Production in Nante Area in the Zambezia Province			JICA (technical cooperation)	JPY 400 million	Extension & training, production		Approved (2010-2015)
	Market-led smallholder development in the Zambezi Valley Project	na	Ministry of planning and Development	IDA (loan), GEF (Grant)	USD 26.7 million	Extension & training, Production, Marketing, Post harvest	incl. small gravity irrigation schemes	2007-2013
	Small Scale Irrigation Project (SSIP)	1,600 ha in total SSIP	Ministry of Agriculture	AfDB, etc	USD 20.5 million in total	Extension & training, Production, Irrigation	inc. establish motor pump, rehabilitate access roads, credit	1999 - 2010 (On going)
Nampula	No foreign aid scheme							
Cabo Delgado	No foreign aid scheme							
Nationwide	Strategic Planning for irrigation in Mozambique	-	MINAG, EU, FAO	EU	USD 416,581	Policy planning for irrigation development	-	2007-2009 (on-going)

Sources: Hydraulic Engineering Department of DNSA, and Baseline Survey on Rice Related Projects in Sub-Saharan Africa, 2009, JICA.

4. Conditions of Major Rice Producing/Potential Areas: Maputo, Gaza, Sofala, Zambézia, Nampula and Cabo Delgado Provinces

4.1 Socioeconomic Conditions

The JICA study team visited six rice growing and potentially growing areas in six provinces, i.e., Maputo, Gaza, Sofala, Zambézia, Nampula and Cabo Delgado. Zambézia had the largest population in the country up to the mid 2000s, but Nampula has slightly exceeded the former according to the Population Census of 2007 (Table 4.1), presumably because of recently increased economic activities along the Nacala corridor. The basic statistics indicate that social conditions are generally better in the southern provinces, though Maputo Province's poverty ratio is the highest among the six provinces (nationally second to Inhambane).

Table 4.1 General Statistics by Province

General	Province	National	Maputo	Gaza	Sofala	Zambézia	Nampula	C. Delgado
Population (1,000) – INE (2007)		20,531	1,260	1,219	1,654	3,893	4,077	1,633
Female population (1,000) – INE (2007)		10,774	686	677	853	2,031	2,077	850
% of population that live below poverty line		54.0%	69.3%	60.1%	36.1%	44.6%	52.6%	63.2%
Area (km ²)		799,380	26,058	75,709	68,018	105,008	81,606	82,625
Population density (person/km ²)		26	48	16	24	37	50	20
Mortality								
Under five mortality rate		178	108	156	205	123	220	241
Infant mortality rate		124	61	92	149	89	164	178
Nutritional status								
Chronic malnutrition among children 0-5 years (stunting)		41%	24%	34%	42%	47%	42%	56%
Acute malnutrition among children 0-5 years (wasting)		4%	0.5%	6.7%	7.6%	5.2%	6.0%	4.1%
Children overweight between 0-5 years		23.7%	9.2%	22.6%	26.2%	26.9%	28.2%	34.2%
Water and Sanitation								
Access to safe drinking water		35.7%	48.9%	50.2%	47.7%	13.7%	32.2%	41.6%
Access to sanitation		44.8%	90.2%	69.4%	28.8%	19.2%	26.2%	53.1%
HIV/AIDS								
HIV/AIDS Prevalence among 15- 49 year olds (2002)		13.6%	17.4%	16.4%	26.5%	12.5%	8.1%	7.5%
Immunization								
Children 12-23 months fully immunized (DPT/HepB)		63.3%	92.5%	82.3%	63.9%	44.7%	53.9%	57.9%
Children 12-23 months immunized against measles		76.7%	96.9%	91.7%	74.7%	63.3%	69.1%	80.2%
Education and Illiteracy								
Primary net enrolment rate		61.0%	86.0%	79.2%	60.4%	59.8%	46.3%	60.6%
Adult illiteracy rate		53.6%	28.6%	47.4%	52.7%	61.4%	65.1%	68.4%
Female illiteracy rate		68.0%	38.0%	55.9%	72.2%	80.6%	81.4%	83.0%
Maternity care and adolescent fertility								
Fertility Rate		5.5	4.1	5.4	6.0	5.3	6.2	5.9
Births attended by skilled health personnel		47.7%	85.2%	60.6%	51.0%	32.1%	38.2%	31.4%
Births in health institutions		49%	85.4%	63.1%	51.6%	32.7%	36.8%	29.6%
Communication								
Total % of population with radios		45.5%	53.4%	34.1%	52.3%	39.4%	48.3%	43.0%

Source: National Institute of Statistics (INE), Statistical Yearbook 2007; and UNICEF Mozambique, as cited in the World Bank's website: (<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/MOZAMBIQUEEXTN/0,,menuPK:382158~pagePK:141132~piPK:141109~theSitePK:382131,00.html>)

Notes: 1) The years of statistics are 2003 unless stated in parentheses.

2) The number of children enrolled in a level in primary school, regardless of age, divided by the population of the age group that officially corresponds to the same level. If the gross enrolment rate is much higher than the net enrolment, this indicates that many children who attend primary school exceed the age group.

3) The number of children enrolled in primary school who belong to the age group that officially corresponds to primary schooling, divided by the total population of the same age group.

In these provinces, rice is cultivated mainly in lowland areas where other food crops, especially maize, cannot be efficiently grown. However, some of the districts prioritized by PAPA for rice production promotion belong to upland areas due to the presence of irrigation schemes including operational and non-operational ones. The selection of districts visited by

the study team was also based on PAPA (Table 3.3 above). In the rice growing areas, there are various other economic, agricultural and non-agricultural, activities. That is, farmers typically do not solely rely on rice cultivation but rather obtain more incomes from other sources while cultivating rice mainly for home consumption. Even in the Chókwè Irrigation Scheme, one of the largest schemes in the country, farmers are engaged in other economic activities (for more details, see Section 5).

4.2 Rice Farming and Farm Management

4.2.1 Gaza

Chókwè: The irrigation scheme is partly under rehabilitation. The soil originated from seabed tends to accumulate salts under the savanna condition.

Farmers who were originally pastoralists had started farming after the civil war, and cultivate 3.74 ha/hh in average.¹⁵ Growing rice in rainy seasons and vegetables in dry seasons is their characteristic farming pattern. Householders (men) are engaged in farming, who have access to bank credits that enable them to adopt improved technology in rice cropping, e.g. plowing using tractor, planting of a modern variety, fertilization, application of agricultural chemicals, etc., thus, increasing their average yield to 1.84 t/ha,¹⁶ which is higher than the national one (0.8–1.2 t/ha). Nevertheless, a leading farmer interviewed by the study team claimed that rice cropping has never yielded enough profit to pay off his debt, yet. Their major income is generated from vegetable cropping, while rice produce is mainly for self-consumption. Yield reduction caused by bird attack is what they considered the most serious problem in rice farming. The surplus of rice production is sold to a private rice processing company, Inácio de Sousa, which has firmly maintained business relationship with the farmers in the region since the colonial time.

4.2.2 Sofala

Beira, Dondo and Buzi: Women are the ones mainly engaged in rice farming in flood plains and damp grounds during the rainy season. In the dry season, they plant sweet potatoes in the field, mixing rice straw into the soil and preparing high ridges to ease drainage. They also grow green vegetables and beans, which are important as major sources of income. Floods and droughts are the principal limiting factors in rice farming, while bird damage accounts for the 10% reduction in yield. Farmers have started selling rice seed to SEMOC since the last crop season under PAPA. They also sell their rice to local traders. Women in Buzi carry and sell their produce in markets in Beira and Chimoio.

4.2.3 Zambezia

Nicoadala: The Mucelo irrigation scheme was planned to cover 250 ha out of 600 ha of farming area, but due to poor maintenance of irrigation canals, only 150 ha has been irrigated. Not only nearby farmers but also producers from Quelimane City who are not always farmers grow rice there. The average farmland is 0.5-1 ha/hh, though producers from Quelimame who have more capital tend to cultivate larger area. Rice cropping is possible only for six months because of the entry of seawater during dry seasons, thus, the rehabilitation of irrigation canals became the major demand of farmers. Rice has been cropped mainly for home consumption, and dry season crops (vegetables, sweet potatoes, beans, etc.) in the high lands

¹⁵ Based on the survey conducted by the JICA Study Team (See Section 5).

¹⁶ Ibid.

became the main source of income for farmers.

Namacura: Flood plains and damp grounds are distributed in the northern area of the District, which is suitable only for rice and coconut farming, while the southern high land is suitable for upland crops (cassava, maize, peanuts, vegetables, etc.). The varying crop suitability of the area divides rules of the production and the shortage of the specific crops one another. Thus, the marketing of the products tend to be concentrated within the area. Rice farmers produce 2-3.5 t/ha in 1.5-2 ha/hh on average. About 20% of the product is solely for home consumption, and the rest is marketed to local traders (mostly women). Sweet potatoes are planted in the field after rice to supplement the staple food. Any difficulty in cropping technique was not claimed, but lack of labor in the busiest season for farming was mentioned.

Mopeia: Rice is cultivated in a flood plain formed by the Zambezi River. Farming has suffered from floods occurring every three years and from drought every five years. Flood and drought that have continued for the last three years have seriously damaged rice farmers, and the number of members leaving the associations had increased. Some farmers have decided to grow not only rice but several other crops as well (maize, sesame, sorghum, etc.) to manage risks. Nevertheless, high yield can be expected under high solar radiation in savanna region without any fertilization, such as 3 t/ha (local varieties) to 5t/ha (improved varieties), in the absence of a natural disaster. Rice farmers of the associations cultivate large farms (< 10 ha) using tractors for plowing, and hire workers for transplanting to obtain higher yield as long as they can afford them. Their produce is stocked in their storehouse, and sold when the price increases. A part of it is sold as rice seed to producers who visit them. The increase of farming cost, fuel and maintenance of equipment, is a burden to the management. Furthermore, rice rat control remains difficult, and robbery of rice grains left in fields sometimes occurs. The Thewe irrigation system is under construction.

Morrumbala: Morire irrigation system was abolished after the Civil War. 100 ha can be irrigated out of the 400 ha of farming area at present.¹⁷ Average rice field area and yield are estimated to be 1 ha/hh and 1 t/ha at most, respectively, by the department of agriculture of Morrumbala District. Maize and several other vegetables (tomato, onion, green pepper, cabbage, etc.) are grown in the fertile flood plain irrigated by pumped water from nearby canal, but the canal is not sufficiently maintained. The products are sold to its neighbor country, Malawi, and to Morrumbala, Quelimane or Beira. A storehouse built in the colonial time has been rehabilitated by an Italian-based NGO (CeLIM), and a market-oriented sale is planned.

Nante: Flood and drought are the major problems in rice farming practiced in flood plains and damp grounds. Therefore, rehabilitation of irrigation system is far more important for farmers than the introduction of cultivation techniques. Farming household cultivates around 2-3 ha (0.5 ha each of irrigated and rain fed rice field, and 1-2 ha of upland cropping) on average. The average yield (1.45 t/ha)¹⁸ is higher than the national average as a result of extension service provided by NGOs (ORAM and APAC) and the Zambezi Valley Development Authority (GPZ). Cassava, maize, and sweet potato are cultivated as staple crop, and rice is sold when they can. The official agencies (DPA and GPZ) have urged farmers to plant an improved rice variety (ITA 312), and the DPA has farmer volunteers who tried rice cropping twice a year since the last cropping season, though the effectiveness has not been verified, yet.

¹⁷ The irrigation scheme was originally designed for 1,000 ha of farming area.

¹⁸ Based on a baseline survey by the JICA study team.

4.2.4 Nampula

Angoche: The women¹⁹ in Angoche rent flood plains and damp grounds in the outskirts of the city, and manage rice farming. Their farm lands are so far from the city (60-70 km) that they have to stay in cabins built in their farms during the cropping season. They hire laborers at the time needed (plowing, transplanting, bird scaring, and harvesting), and grow rice without any fertilization. The rice yield could not be estimated because the farming areas are not known, but the production cost is known by each woman. A part of the product is left for home consumption and rice seed for the next cropping season, and the rest is sold to local market retailers (mostly women) who visit them. They are engaged only in rice farming, so they buy the other staple food (cassava, maize, or peanuts). Rice cropping is profitable for them based on the analysis of the obtained data, total yield, farming cost, and return from sales. For them, the difficulties in rice farming include the lack of transportation facilities to the field, the building of field cabins, obtaining daily supplies for the daily life at the cabin, obtaining field workers, and so on. Technical problem for cropping was not mentioned.

The farmers in the village of Nametória, 30 km away from Anboche, grow rice as a supplement of the staple crops (cassava and maize). Their major income comes from peanut cropping. Men are engaged in farming due to the scarcity of other job opportunities. Because local dealers rarely visit them who live far from main route, the surplus of the production is marketed to the local markets by themselves. A rice mill of a farmers association is under construction in Nametória, and they are planning to sell all rice to the factory to be free from transportation problem.

4.2.5 Cabo Delgado

Balama (Chipemba): The irrigation system has been abolished for more than two decades. Only six families grow rice in the margin of the barrage, in the lowlands utilizing leaked stream from the barrage, or in the uplands. There are a total of 6 ha grown with rice. Small profit (high production cost and low price), small markets that soon gets saturated at harvest time, damage by bird attack, etc. are mentioned as difficulties incurred in rice farming. Other than rice, maize, cassava, sorghum, or millet are cultivated as staple crops during wet season, while sweet potato and several other kinds of vegetable (tomato, onion, cabbage, or garlic) are grown in dry season. All crops are mainly grown for home consumption, and the surplus is mostly sold in the local markets.

Muidumbe (N'guri): Rice is grown in fertile flood plains and damp grounds around the irrigation area, where the system has been abolished since 1994. Farmers have 1 ha/hh each of rice and upland crop fields on average. Maize, cassava, and sweet potato as staple crops, and sesame as a cash crop, are grown in uplands during the wet season. Mung bean is grown in the dry season. Their earnings are mostly from rice, and then followed by sesame. Difficulties incurred in rice farming included irregular precipitation, lack of labor (increase of the payment), unavailability of fertilizer, expensive farming tools, lack of transportation facilities, and so on.

Pemba Metuge: Rain fed rice field is located in flood plains. On average, they obtain 0.7 t/ha of rice production from 0.9 ha/hh of rain fed field, and grow cassava, maize, or sorghum in 0.5 ha/hh of upland in a dry season. Crops in the dry season are sweet potato, mung bean, and green vegetables. Damages by rat and locust, and high labor cost are mentioned as the difficult aspects in rice farming. Crops are firstly grown for home consumption, and the

¹⁹ A local language, Macua, is spoken in their daily life, and only two out of 11 participants understood Portuguese.

surplus is sold to retailers in local markets and in Pemba.

4.3 Marketing

Rice is produced mainly for home consumption in Mozambique and the quantity marketed is 16% or below of the total production in 2002-2008 (Table 4.2), which is even lower than that of maize, a more important staple in the country. Rice is traded, if any, mostly through informal channels in small quantity (e.g., one or two bags of 50kg). This situation was also grasped to some extent through the field visits of the present study. The only exception is rice production in the Chókwè Irrigation Scheme, which has been commercially oriented since its outset. The percentage of quantity marketed was as high as 33% in Gaza Province in 2005. PAPA's estimate for the quantity of rice to be marketed in 2008/09, 75,900 tons or 30% of the total production, therefore, seems to be rather too optimistic based on the past trend.

Table 4.2: Percentage of Rice marketed out of Rice produced in 2002-2008

Province	2002	2003	2005	2006	2007	2008
Niassa	20	50	19	27	25	22
Cabo Delgado	14	16	11	16	15	13
Nampula	15	14	12	21	11	25
Zambezia	9	18	11	18	14	19
Tete	2	35	4	15	4	26
Manica	-	13	10	23	-	24
Sofala	-	6	3	6	1	2
Inhambane	4	-	5	11	4	-
Gaza	15	13	33	0.3	3	9
Maputo	-	26	21	-	-	17
National: Rice	10	16	10	16	12	16
National: Maize	26	23	22	22	20	18

Source: Ministry of Agriculture, Trabalho Inquérito Agrícola (TIA) 2007.

Previous studies, as well as NRDS, have implied that the improvement of marketing would help the domestic production increase more rapidly.²⁰ However, the most critical issue for rice development in Mozambique is that the supply of domestically grown rice in the market is limited and volatile, reflecting the generally unstable production dependent on rainfalls. Even in Zambézia, the largest producing province of the country, the demand for imported rice decreases only for three to four months after the harvesting season and picks up again in late August or September.²¹ This suggests that there is not adequate supply of rice within the provincial market as a whole. Interviews with subsistence rice farmers have indicated that they try to retain as much output as possible and sell rice only when they need some cash.

The largest rice mills visited by the study team are ones located in Palmeira, Maputo Province and another in Chókwè, Gaza Province. Both process rice from the Chókwè Irrigation Scheme. The former has a milling capacity of 3.5 tons/hour, but one of the two lines is not operational. The company, Inácio de Sousa, was established in 1945 and introduced the rice mill as part of its family-owned agribusiness in 1960. It purchases rice directly from farmers in Chókwè, paying by check that can be cashed at banks. The latter was formerly owned by Oricicola do Limpopo (ORLI) rice factory but recently acquired and rehabilitated by Moçfer Industrias Alimentares (MIA). Its capacity is 3.0 tons/hour (20,000 tons/year). MIA purchases

²⁰ See, for example, Agrifood Consulting International, op cit., p. 119.

²¹ Information obtained from Delta Trading Cia, Lda., Beira Branch. The company is one of the two largest rice importers in Mozambique.

rice only from its contract farmers, currently about 60, since the company is promoting certain high-yielding varieties, e.g., ITA 312 and IRGA 417.

There are small-scale private mills operating in areas where some quantity of rice is available for marketing, e.g., Buzi District in Sofala, Maganja da Costa District in Zambezia and Muidumbe District in Cabo Delgado. While the efficiency and technologies of these would need to be improved for lower costs and higher quality in the future, there does not seem to be much to be done by the public sector except providing some incentives and financial assistance for establishing mills. Nevertheless, government promotion of that kind would be meaningful only when paddy is supplied sufficiently and stably in the market.

One of more serious problems in the marketing of locally grown rice is lack of finance for purchasing paddy, though the problem partially stems from poor management. Companhia Agro-Industrial de Moçambique Lda. (CAIMOC), which has two rice milling facilities with the capacity of four tons/day each in Zambézia Province, had not started collecting paddy from the Nante Irrigation Scheme at the time of the study team’s visit due to lack of funds. The company had failed to obtain loans from a commercial bank because the value of their assets did not meet the required collateral. CAIMOC was established by two private companies, one South African and another Mozambican, and GPZ in 2006 but is currently fully owned by GPZ.

For imported rice, on the other hand, the value chain has been completed in that an adequate quantity is supplied for the whole year at a relatively lower price for standardized quality as compared with domestically grown rice. There are established marketing channels from importers through distributors and retailers to consumers nationwide (Figure 4.1). The important element in the value chain is sale on credit with the terms varying according to business relationships (e.g., volume dealt with, length of business, trustworthiness, etc.)

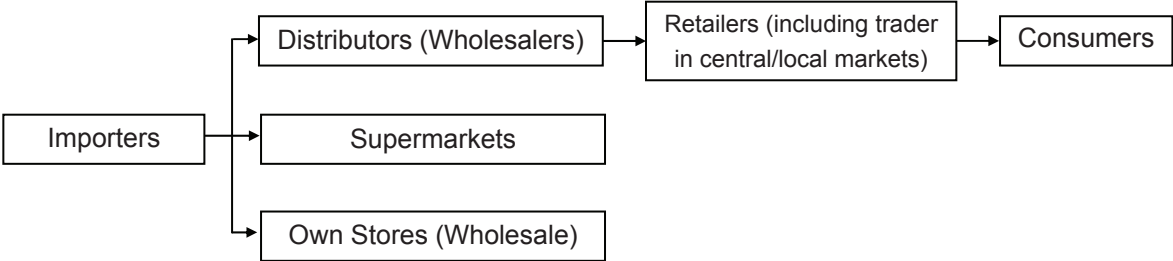


Figure 4.1: Marketing Channels for Imported Rice

The Mozambican market for imported rice is geographically divided into three, i.e., the southern, central and northern zones. The southern zone (Maputo City and Maputo, Gaza and Inhambane Provinces) is supplied mainly from the Maputo port, the central zone (Sofala, Manica, Zambézia and Tete Provinces) from the Beira port and the northern zone (Nampula, Cabo Delgado and Niassa Provinces) from the Nacala port (Figure 4.2). The northern zone may be partially supplied from Beira and the central zone from Nacala. While the quantities imported at these ports fluctuate, Maputo’s share is far larger than the other two ports, accounting for 60-70% of the total quantity imported in 2003-2008 (Table 4.3). The southern zone, particularly Maputo City, is also supplied from South Africa by land as rice packed there are widely sold in supermarkets in Maputo, but the quantity has yet to be investigated. Nacala’s share exhibited an upward trend at least until 2007.



Figure 4.2: Flows of Imported Rice (Conceptual) in Mozambique

Table 4.3: Quantity of Rice imported by Port in 2003-2008 (1,000 tons)

Ports	2003		2004		2005		2006		2007		2008	
	Qty.	%	Qty.	%	Qty.	%	Qty.	%	Qty.	%	Qty.	%
Maputo	230.4	71.3	202.5	64.0	257.8	68.3	205.2	60.1	247.9	73.0	82.3	65.9
Beira	70.2	21.7	71.7	22.7	--	--	85.1	24.9	40.4	11.9	24.2	19.4
Nacala	22.4	6.9	42.3	13.4	--	--	50.9	14.9	51.2	15.1	18.4	14.7
Total	323.0	100.0	316.5	100.0	377.4	100.0	341.2	100.0	339.5	100.0	124.9	100.0

Source: National Directorate of Commerce, Ministry of Industry and Commerce.

4.4 Infrastructure

4.4.1 Geography, Climate and River Runoff

Mozambique is located on the east coast of southern Africa on the Indian Ocean, between latitudes 10°27'S and 26°52'S and longitudes 30°12'W and 40°51'W. The country has a total area of 801,590 km². There are three basic geographic divisions:

- A coastal belt which covers about 44 percent of the country, comprising most of the areas south of the Save River and the lower Zambezi area;

- A middle plateau, ranging from 200 – 1,000 m in elevation and covering about 29 percent of the country; and
- A plateau and highland region with average elevations of around 1,000 m to the north of the Zambezi River covering about 27 percent of the country.

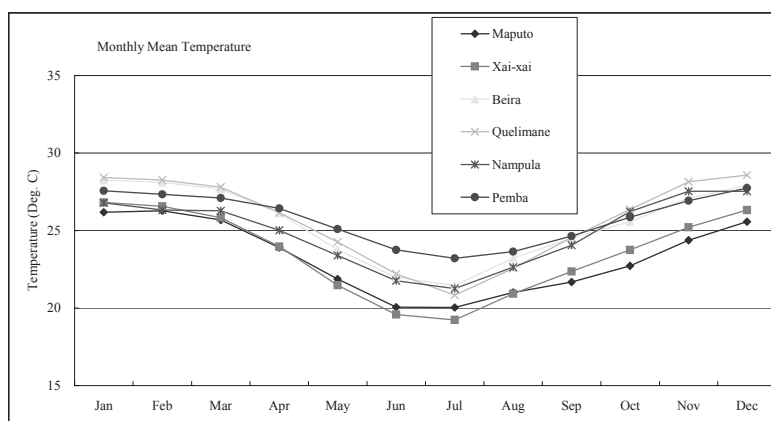
In 2007, the cultivated area was estimated at 4.80 million ha, of which 4.45 million ha was “arable land” (land under temporary crops), while 0.35 million ha were under permanent crops.²²

The climate varies from tropical and subtropical conditions in the north and central parts of Mozambique to dry semi-arid steppe and dry arid desert climate in the south. The mean temperature of the study area in dry season from May to September is ranging 20-25 °C, while rainy season is 25 – 30 °C (Table 4.4).

Table 4.4: Monthly Mean Temperature (Average of 1999 -2009)

City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Maputo	26	26	26	24	22	20	20	21	22	23	24	26	23
Xai-xai	27	27	26	24	21	20	19	21	22	24	25	26	24
Beira	28	28	28	26	24	22	21	23	25	26	27	28	25
Quelimane	28	28	28	26	24	22	21	23	25	26	28	29	26
Nampula	27	26	26	25	23	22	21	23	24	26	28	28	25
Pemba	28	27	27	26	25	24	23	24	25	26	27	28	26

Source: INAM in Maputo



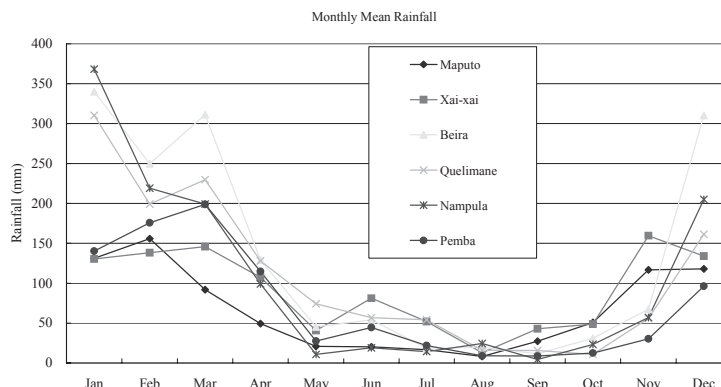
The annual average rainfall for the whole country is estimated at 1,032 mm (FAO) and the rainy season lasts from October to April. Rainfall varies widely from the coast to the inland areas and from north to south. Average annual rainfalls for last 10 years provided to the study team by the National Institution of Meteorology (INAM) range from 800 to 1,000 mm in Maputo, Xai-xai, and Pemba, 1,200 to 1,400 mm in Quelimane and Numpla, and about 1,600 mm in Beira (Table 4.5). The north and central part of the country has annual rainfall from 1,000 to 2,000 mm, because of the northeast monsoon and high mountains.

²² FAOSTAT (<http://faostat.fao.org>) updated April 30, 2009. Note that FAOSTAT’s “arable land” designates “land under temporary crops”.

Table 4.5: Monthly Mean Rainfall (Average of 1999 -2009)

City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Maputo	131	156	92	49	21	21	17	8	27	51	117	118	810
Xai-xai	130	138	146	107	41	81	52	13	43	49	160	134	1094
Beira	340	250	311	129	45	54	19	20	12	31	67	310	1590
Quelimane	310	199	230	128	74	57	54	16	16	11	56	161	1313
Nampula	368	219	199	99	11	19	14	25	4	23	57	205	1245
Pemba	140	176	199	115	28	45	22	9	9	13	30	96	881

Source: INAM in Maputo



Tropical cyclone and the El Nino/La Nina compound resulted in extreme floods and droughts such as the flood of 2000 in the south and 2001 in the Center of the country. More local droughts are observed every 4-5 years. The year of major floods in the county over last 25 years are; 1977, 1978, 1985, 1988, 2000 and 2001, and major droughts are 1981, 1984, 1991, 1992, 1994, 1995 and 2002-2003 (Figure 4.3).

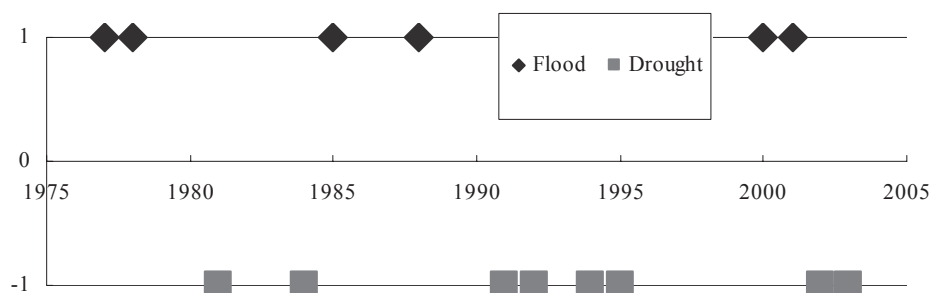


Figure 4.3: Major floods and droughts in 1975-2005

Data source: INAM in Maputo.

Mean annual runoffs of major rivers are tabulated in Table 4.6.

Table 4.6: Mean Annual Runoffs of Major Rivers

River basin	Mean Annual Runoff (M m ³ /year)
Maputo	3,800
Umbeluzi	296
Inkomati	2,677
Limpopo	5,773
Buzi	642
Pungoe	3,375
Zambezea	106,000

Source: Mozambique Country Water Resources Assistance Strategy, 2007, WB

3.4.2 Irrigation Infrastructure and its Conditions

(1) Overview

Although irrigation potential was estimated at 3,072,000 ha by FAO, equipped area is counted at 123,223 ha by DNSA or 4% of the potential area only (2008/09) (Table 4.7). Among the equipped area, operational area is estimated at 42,014 ha or 34% of the equipped area. Some 81,000 ha is not used as irrigated farm land due to deterioration of pumps and damages of canals as well as poor management of the scheme. The Provinces of Maputo, Sofala and Gaza have the operational area of more than 8,000 ha, but the other provinces have more or less than 1,000 ha only. The total number of irrigation schemes is 513.

Table 4.7: Irrigation Area under DNSA (2008-2009)

Province	Nos of schemes	Equipped area	(Unit: ha)			
			Operational area		Balance	
1 Maputo	193	27,107	15,323	(57%)	11,784	(43%)
2 Gaza	28	50,323	8,825	(18%)	41,498	(82%)
3 Sofala	45	24,319	13,892	(57%)	10,427	(43%)
4 Zambezia	37	10,852	967	(9%)	9,885	(91%)
5 Nampula	9	1,080	610	(56%)	470	(44%)
6 Cabo Delgado	6	1,764	45	(3%)	1,719	(97%)
Sub-total (1)	318	115,445	39,662	(34%)	75,783	(66%)
7 Inhambane	8	1,285	177	(14%)	1,108	(86%)
8 Manica	106	3,706	1,404	(38%)	2,302	(62%)
9 Niassa	5	608	7	(1%)	601	(99%)
10 Tete	76	2,179	764	(35%)	1,415	(65%)
Sub-total (2)	195	7,778	2,352	(30%)	5,426	(70%)
Total	513	123,223	42,014		81,209	
		(100%)	(34%)		(66%)	

Source: DNSA (2008-09)

Sugarcane is the main crop under the irrigation (56% of operation area or 23,658 ha) (Table 4.8). According to the AQUASTAT of FAO (using 2003 data), the second crop is vegetables (about 17% or 7,000 ha) and the third one is rice (10% or 4,100 ha only).

Table 4.8: Irrigation Area by Crop (Sugarcane and others)

Province	Equipped area (ha)			Operational area (ha)			Nos. of sugar area
	Sugar cane	Others*	Total	Sugar cane	Others*	Total	
1 Maputo	11,343	15,764	27,107	9,859	5,464	15,323	2
2 Gaza	0	50,323	50,323	0	8,825	8,825	
3 Sofala	19,299	5,020	24,319	13,799	93	13,892	3
4 Zambezia	7,000	3,852	10,852	0	967	967	1
5 Nampula	0	1,080	1,080	0	610	610	
6 Cabo Delgado	0	1,764	1,764	0	45	45	
Sub-total (1)	37,642	77,803	115,445	23,658	16,004	39,662	6
7 Inhambane	0	1,285	1,285	0	177	177	
8 Manica	0	3,706	3,706	0	1,404	1,404	
9 Niassa	0	608	608	0	7	7	
10 Tete	0	2,179	2,179	0	764	764	
Sub-total (2)	0	7,778	7,778	0	2,352	2,352	0
Total	37,642	85,581	123,223	23,658	18,356	42,014	6
	(31%)	(69%)	(100%)	(56%)	(44%)	(100%)	

Source: DNSA (2008-09)

*: Main crops of "Others" are vegetables and rice.

Large-scale schemes over 500 ha occupied 80% of area actually irrigated (figures in the following table are quoted from 2003 survey), but the area of small-scale schemes is only 8% (Table 4.9). Sprinkler and surface irrigation are the main irrigation methods in the country.

Table 4.9: Irrigation Area by Size (Area) and Method

Area actually irrigated				Irrigation method			
<50 ha	50-500 ha	>500 ha	Total	Surface	Sprinkler	Drip	Total
3,276	4,680	32,107	40,063	16,856	19,860	3347	40,063
(8%)	(12%)	(80%)	(100%)	(42%)	(50%)	(8%)	1

Source: AQUA-STAT of FAO

At the present, irrigated areas are used by smallholders and agricultural enterprises. The largest schemes are the Chókwe scheme in the Limpopo basin (26,000 ha equipped area) and a series of sugar cane plantations in the Incomati, Buzi and Zambezi valleys (37,642 ha equipped area). Small-scale irrigation exists everywhere in the country, either abandoned or partly utilized. Most of the schemes are in a bad to very bad condition, and only a relatively small part of the irrigation schemes is actually irrigated.

The World Bank estimates the total irrigation water requirement at 600 million m³/year in 2005 and 1,085 million m³/year in 2015, assuming irrigation efficiency of 45% at present and that the irrigation area would be increased to double the current irrigated area mainly through rehabilitation of the existing irrigation schemes till 2015 (Table 4.10).

Table 4.10: Irrigation Area and Water Demand by River Basin

River basin	Irrigated area (ha)		Water Demand (M m ³ /year)	
	Presnt (2003)	Projected (2015)	Presnt (2003)	Projected (2015)
Umbeluzi	850	4,000	13	60
Inkomati	10,340	23,900	155	251
Limpopo	4,000	20,000	60	210
Buzi	0	6,100	0	90
Pungoe	7,420	10,620	111	160
Zambeze	7,880	10,500	95	126
Ligonha	4,500	7,470	67	78
Messalo	0	0	0	0
Lichinga	7,360	10,520	110	110
Total	42,350	93,110	611	1085

Source: The World Bank, Mozambique Country Water Resources Assistance Strategy, August 2007.

(2) Irrigation Development

The National Directorate of Water (DNA), the Ministry of Public Works and Housing (MOPH), are responsible for policy formulation and implementation, overall planning and management of the country's water resources and water supply and sanitation services.

The Hydraulic Engineering Department under DNSA of the Ministry of Agriculture is a coordinating agency for activities relating to irrigation and drainage. It performs studies, executes agricultural hydraulics projects and supports smallholder irrigation development. Although the importance of irrigation is well recognized for stable production and increase of the agricultural production, the Department was downgraded from directorate level in 2006.

The number of irrigation engineers is small against numerous duties for irrigation development as shown in Table 4.12.

Table 4.12: Number of Irrigation Staff and Area and Schemes per Irrigation Engineer

Item	DNSA (whole country)	Maputo	Gaza*	Sofala	Zambezia	Nampula	Cabo Delgado
Nos. of Irrigation Eng'r (IE)	8	2	4	2	2	2	0
Nos. of Assistant IE	3	2	3	4	1	1	1
Equip area per IE (ha)	15,403	13,554	12,581	12,160	5,426	540	-
Nos. of scheme per IE	64	97	7	23	19	5	-

Source: National Directorate of Agricultural Services (DNSA), Ministry of Agriculture.

Due to lack of irrigation engineers as well as budget of the Department, the slow pace of development has been maintained for a long period. In addition, no national guidelines for planning and design of irrigation development is formulated yet, and no revision and updating of the National Irrigation Development Plan prepared in 1993 by French consultant is realized.

(3) Field Survey in Five Provinces

During the field survey, 20 schemes in five provinces are visited by the irrigation specialist of the JICA study team to grasp the present conditions and constraints of irrigation schemes operated by farmers' groups and enterprises (Table 4.11). Nampula Province was not visited due to the absence of irrigation staff during the study period.

Table 4.11: Present Conditions of the Irrigation Schemes visited by the JICA Study Team

Province	Nos. of scheme visited	Description
Maputo	3	Small pump schemes along the Maputo river operated by farmers association, small scale enterprise, and newly constructed scheme by AfDB fund
Gaza	2	Chókwè scheme (26,000 ha) fed by diversion weir on the Limpopo river and abandoned pump irrigation scheme (8,000 ha) in Bilene District
Sofala	5	Small-scale pump irrigation schemes operated by small holders and funded by international organization and bi-lateral co operations in Dondo and Nhamatanda Districts.
Zambezia	8	Free intake schemes with supplemental water supply by pumps in Nante area in Ganja da Costa District, existing and under construction pump irrigation schemes in Mopeia District, deteriorated pump schemes and schemes affected by sea water intrusion in Nicoadala
Cabo Delgado	2	Abandoned dam irrigation scheme in Balama District and large-scale pump irrigation scheme (1,000 ha) which was also abandoned in Muidumbe District

After visiting 20 schemes during the field survey, it is recognized that the following backgrounds strongly affect the present conditions:

- The extended civil war led to the destruction of irrigation infrastructures and forced the abandonment of others;
- After independence (1992-95), the original owners (state company and/ or colonial farmers) abandoned the irrigated lands, and the new owners (group of small farmers) who are greatly lacked experience in the management of schemes entered to the lands;
- The lack of inputs and technical assistance of the government for operation and maintenance (O&M) and improvements of irrigation schemes has accelerated deterioration of infrastructures;
- The floods in 2000 and 2001 seriously damaged many irrigated schemes;
- Insufficient deployment of irrigation engineers to the Provincial offices is found, though necessity for providing irrigation facilities as basic infrastructure for stable production is well recognized; and
- Irrigation schemes constructed recently and under construction with financial assistance of foreign official funds gave higher priority to easy and quick construction (pump plus pipe line system), but not to durability and farmers participation (weir and open canal system).

4.4.4 Constraints in Irrigation

Through the field survey in five provinces, the following constraints are found in irrigation for rice production:

- Serious deterioration and damages on the existing irrigation and drainage facilities including flood protection due to lack of proper and periodical O&M activities; rehabilitation and upgrading of these facilities is urgently needed to realize stable production in wet season and increase in dry season,
- No budget and staff for regeneration of developed lands during colonial period; lands remain un-used though land and water are available,
- Easy use of pumps and pile line in the flood plan; Pumps are usually employed for

irrigation of rice, since small investment cost and quick construction period can be expected. However, pump irrigation schemes have many problems such as high energy cost comparing with rice price, no reserve for replacement and repair of pump and engine, less collection of irrigation fee, poor performance of associations. More stable and efficient pumps for low lifting head are needed.

- No financial and technical capability of small holders due to low income from their farming and lack of proper assistance and guidance by the government
- No proper employment and training to Irrigation Engineers, who are the key resource for irrigation development; present numbers are too small comparing with their duties,
- No standard guideline for irrigation development for the country; some international agencies and donors might prefer to deploy the pump with pipe line system because of quick and easy construction, though it cost is higher than the expected cost of the government and gravity and open canal system.

4.5 Support Services

(1) Research

The Chókwè Research Center of IIAM has a rice researcher and a rice breeder who is the only breeder in the center, though the center has started breeding programs for other crops. Variety adaptability of rice and other several crops has been tested. It is recognized that a research on how to reduce rice production cost is highly required for the promotion of rice cropping, but such research has not been planed.

The Quelimane Branch of Northwestern Zone Center, IIAM, has settled since 2006. Three rice researchers (two rice breeders and one agronomist of rice cropping) are stationed there, but the center has neither its own building nor land. The researchers, despite the poor research condition, have implemented breeding trials and a trial on the effectiveness of Azolla.

MIA has an experienced rice researcher and other agronomists who work on rice to breed suitable varieties in the northeastern region, and to develop appropriate cropping pattern for rice together with the second crops in more than 500 ha of experimental fields.

(2) Extension

The number of extension workers is insufficient to cater the needs of all the farmers in their assigned areas. The mandatory service of 250 families per extension worker is unrealistic. The issuance of motorbikes to extension workers has not been completed, which is why extension workers could hardly visit farmers rice fields, which are often located in isolated rural areas that are inaccessible without transport facilities. Nevertheless, most farmers whom the Mission has interviewed have received some form of services from the extension workers. Training programs of extension workers have been insufficient.

(3) Rice Seed distribution

National rice seed multiplication system has not been established, as well as the verification system of certified seeds.

(4) Rural Finance

Finance services for rice cultivation are virtually non-existent in the areas visited by the study

team except Chókwè and Nante. In the former scheme, 79% of rice farmers receive finance from banks and other lending institutions such as savings and credit cooperatives (See Section 5). Chókwè's situation has long been made possible by the regular purchase of paddy by the rice miller in Palmeira, Maputo Province. In the latter scheme, a limited number of farmers obtain some finance for rice cultivation from the Local Initiative Fund (FIL) and the Provincial Directorate of Agriculture, but these seem rather ad-hoc than permanent arrangements. The Office for Assistance to Small Industries (GAPI) provides loans for agro-processing including the purchase of milling machinery.

(5) Market Information Services

MINAG's SIMA is operational in all the provinces and, according to TIA 2007, 34% of farmers on national average with some variation by province receive price information of all sources²³. However, main information sources seem to be informal, i.e., relatives and friends, as indicated in the social survey conducted in the present study. For paddy harvested in major irrigation schemes, particularly Chókwè and Nante, prices received by farmers are negotiated and determined at a meeting attended by government officials, farmer representatives, rice milling companies, etc. Therefore, they are known for the farmers before the crop season starts.

²³ Ministry of Agriculture, Trabalho Inquérito Agrícola (TIA) 2007.

5. Present Situation of Rice Farmers and their Surroundings

5.1 Chókwè Area, Gaza Province

5.1.1 Farmers Interviewed

In Chókwè irrigation scheme, there are three (3) hydraulic sections, i.e., Montante, Sur and Rio, representing respectively the upstream, middle stream and downstream areas of the irrigation system. According to the recommendation by HICEP, one water users association was selected from each section to be interviewed as shown in Table 5.1. As for the Montante section, however, a JICA project to support rice production has currently been in operation, and a socio-economic survey has been conducted in the area by the Project at the time of this study. Therefore, the study inevitably covers a Water Users Association (WUA) in Montante section that is not fully involved in rice farming so as to avoid overlapping between the Project and this study.

Table 5.1: Information on the WUAs Interviewed

Section \ WUA	Name of WUA	Location	No. of WUA members	No. of farmers interviewed
Montante	Gajane	Bairro No.3, Chókwè City	429	35
Sur	Revolução Verde	Machicolowane	192	30
Rio	Areprizona	Chilembene	223	29

Source: Banco de Dados das Associações (documents provided by HICEP)

The total number of the interviewed farmers is 94, the majority of whom are the members of the WUAs with a small number of exceptions. About 69% of the respondents are from the male headed household, and the size of the household varies from 1 to 16 persons, with 6.7 persons per household on average. As for the ethnicity, 97% are Changanas, and about 60% of the household heads are originally from Chókwè District. More than 70% are the Christians but of various sects and denominations.

5.1.2 Living Conditions and Livelihood

In Montante and Rio sections, the farmers are living in the urban setting, as their residences are in the city of Chókwè and township of Chilembene, where infrastructure and basic living facilities are relatively better than the areas distant from the township such as Machicolowane in Sur section.

About 82% of the respondents live in their own houses, while the rest are in the state house or the privately rented house. Slightly more than half of the respondents (57%) assess the conditions of their houses are not satisfactory, while the rest consider the houses are in good conditions. As for the water and electricity, 80% of the households are provided with the piped water, and 45% have electricity in their houses. More than a half of the households (52%) own bicycles, 47% with radio, 37% with TV, and 17% with motorcycles.

As for the education, 28% of the household heads enrolled at the first stage of primary education (EP-I), 10% at the second stage of primary education (EP-II), 7% at the first stage of secondary education (ESG-I), while 5.3% have completed the second stage of secondary education (ESG-II). The access to the educational facilities seems to be good, as 69% of the respondents spend less than 30 minutes by foot to reach to the school.

Nearly 80% of the households have sanitary toilet facilities, either improved or flush latrines. For 68% of the respondents, the health facilities are at the vicinity reachable by foot within 30

minutes. The most popular disease among the households is malaria from which 62% of respondents suffer during last one year, while about 20% of the respondents experienced no sickness for the same period.

The major source of income among the respondents is farming activities; however, accurate details of the farm income and expenditure were not obtained through the study. Rough estimation of the gross farm income from all of the farm activities based on the available data widely ranges from less than MT 1,000 to more than MT 1,600,000, with MT 54,000 on average. There are also off farm activities undertaken by the respondents' households. There are family members with regular employment in 18% of households, while 11% of households with family members engaged in business activities. As for the household expenditures, 98% of the households spent on food, 93% on daily consumables, 85% on medication, 73% on education, and 53% on the ceremonies and festivities, although the accurate figures were not disclosed by the respondents. Among the various expenditures, the costs incurred for children's education are considered as most pressing expenditure by 36% of the households, followed by the food items (26%), and daily consumables (25%).

Food shortage is not quite conspicuous among the interviewed farmers, as 70% of the respondents did not experience any food shortage during last one year, while 15% had food shortage problem for a period of less than a month.

5.1.3 Rice Production

Among the 94 farmers interviewed, only 62 households were engaged in rice production; among those rice producers, 60 households could harvest and 58 households sold their produce during last one year. Dry season cropping was exercised by 68% of the farmers, while 32% produced in rainy season.

The area planted with rice varies from 0.24 to 25 ha, with average of 3.74 ha, and the average yield is 1.84 ton per hectare. A breakdown of the number of households, area and yield per hydraulic section are shown in Table 5.2. The utilization rate of paddy fields is 71%, i.e., a total of 239 ha cultivated against 335.3 ha owned by the respondents.

Table 5.2: Rice Farming Households, Areas of Cultivation and Yields

Section	No. of HH produced rice	No. of HH harvested rice	No. of HH sold rice	Average areas cultivated (ha)	Average yield per ha (ton)
Montante	6	6	5	0.79	2.44
Sur	30	28	27	1.63	1.99
Rio	26	26	26	6.85	1.53
Total	62	60	58	3.74	1.84

The most popular variety of rice in the area is ITA312, grown by 69% of the rice producers interviewed, which is preferred by the farmers because of its high yield as well as of its taste. About 57% of respondents bought the seed from private traders such as MIA, while 32% used the seed produced themselves in the previous cropping season. The farmers practiced modern farming, applying agro-inputs in their rice production. About 94% of the respondents applied fertilizer with average dose of 180 kg per ha, and 39% utilized the certified seeds with average usage of 97 kg per ha. Average price of fertilizer is MT 1,220 for a bag of 50 kg and average price of certified seed is MT 22 per kg. About one-fourth of respondents (26%) also applied herbicide. Most of the farmers procure these agro-inputs from shops in Chókwè City. The available labor force for rice production is 2.4 persons per household on average, which does not seem to be sufficient for production, as 94% of the interviewed rice producers hired labor for various rice production, mainly for transplanting, weeding and bird chasing.

As for the marketing, 71% of the rice producers brought their produce to the buyers for sale. With MIA's operation base in Chókwè City, the farmers in the area have relatively constant buyers. As much as 83% of the total yield was sold by farmers with average selling price of MT 6.66 per kg.

It is to be noted that 79% of these rice producers could avail agricultural credits from several lending institutions. The average amount of loan is about MT 258,500, generally with 10% of annual interest. These loans may be provided on yearly basis or per cropping season. Mode of repayment is systematized that the farmers sell their produce and receive checks to be cashed at the bank, where the amount payable is deducted and then the balance is given to the farmers. However, the farmers interviewed at the group discussion pointed out that there are often cases in which the handling procedure at the banks takes so long time that the farmers cannot timely get money to prepare for next season, resulting in the late cropping.

5.1.4 Other Farm Activities and Support Services

More than half of the interviewed farmers (52%) grow crops other than rice, such as maize, beans and vegetables. Maize is observed as a crop mostly for home consumption, while the vegetables are important cash crops. It was shared during the group discussion, however, that the farmers often experience difficulties in looking for the buyers in the locality for those crops with satisfactory selling price. More than 57% of farmers also raise livestock, such as cattle chicken, ducks and goats.

Farm tools and equipments holdings are limited to simple ones, such as sickles (owned by 59% of the households), knapsack sprayer, wheelbarrow (both by 29%), and so forth. Most of the farmers hire tractor services rendered by the private businessmen in the locality at the time of land preparation, which costs around MT 1,500 to 2,000 per ha. According to the farmers participated in the group discussion, the available service of the agricultural machinery is not sufficient enough to meet the demand.

The farmers obtain information on agricultural technologies from various sources. The most popular source of information is relatives (62%), followed by the extension service (53%) and neighbors (47%). It is to be noted that 22% of the respondents obtain these kinds of information also from the private traders, while the radio and TV are regarded as source of information, each by 16% of the respondents.

As the major problem in their farm activities, 73% of the respondents raised the difficulties in obtaining agro-inputs. Shortage or excess of irrigation water is of immense concern for 35% of the respondents, which is particularly true in Sur section where more than half of the respondents pointed this issue as one of the major problems. Despite of these problems, the interviewed farmers have various prospects in their farming in the future. The major prospects are the expansion of the production scale (79%) and crop diversification (43%).

5.2 Nante Area, Zambézia Province

5.2.1 Farmers Interviewed

It is said that there are 18 lowland areas in Nante with high potential for rice production, among which only Intabo and Mundamunda are furnished, even partially, with irrigation facilities and structures. These irrigation schemes were originally developed by a Portuguese

company in the 1970s, handed over to a state enterprise upon Independence, which, however, was abolished during the Civil War. The WUAs are recently established in these schemes with supports from GPZ, Provincial Department of Agriculture and NGOs. With facilitation of the Nante Area Coordinator of GPZ, the respondents indicated in Table 5.3 gathered through these WUAs for interviews and questionnaire survey.

Table 5.3: Information on the WUAs interviewed

WUA Scheme	Total planned area under the scheme (ha)	Areas currently irrigated (ha)	No. of WUA members	No. of farmers interviewed
Intabo	1,000	715	1,312	55
Mundamunda	3,000	700	1,751	44

Source: Interview with the officials of the respective WUAs

The total number of the interviewed farmers is 99, i.e., 55 from Intabo and 44 from Mundamunda. About 84% of the respondents are from the male headed household, and the size of the household varies from 1 to 12 persons, with 5.2 persons per household on average. Almost all households (99%) belong to the ethnic group of Chuabos, and 96% of the household heads are originally from Maganja da Costa District. More than 80% of the respondents are the Christians while the rest are the Muslims.

5.2.2 Living Conditions and Livelihood

Villages covered under Intabo and Mundamunda schemes are about 4 to 8 km away from Nante Sede, the central township of Localidade Nante. Villages are scattered amongst the remote rural areas where basic infrastructures and living amenities are found to a minimal degree.

Almost all of the respondents (99%) live in their own houses. About a half of the respondents (47%) assess the conditions of their houses are good, and the rest feel that they are not satisfactory. Except for those who live in and around the town proper of Nante Sede, there is no service of piped water or lined electricity in the area. The majority (88%) of the households avail water from the wells, and 98% have no electricity in their houses. There are only 2 households with non-wired electricity devises such as solar panel and generator. Since there is no means of public transportation between the villages of their residences and Nante Sede, 61% of respondents have bicycles, while motorcycle is owned only by 7%; another household asset of relatively common possession is radio, which is owned by 39% of the households.

As for the education, 34% of the household heads had enrolled at EP-I, 6% at EP-II, 3% at ESG-I, while 32% have no educational background. As there are EP-I schools in most of the villages, 69% of the respondents spend less than 30 minutes by foot to reach to the educational facilities.

There are only 3% of the households who have sanitary toilet facilities, and 22% do not even have toilet facilities at their houses. For 61% of the respondents, the health facilities are not accessible by foot, and 23% of households must walk more than 1 hour. The most popular disease among the households is malaria from which 46% of respondents suffer during last one year, while 27% of the respondents experienced no sickness for the same period. The dominant source of income in the area is farming, despite of its subsistent nature. Farmers not only grow various food crops and fruits trees in upland and within home

compounds but also rear small number of livestock, and those farm products are sold informally in small amount when the family needs any cash income. It is thus quite difficult for the farmers to recall the accurate amount of produce sold or the selling prices, let alone the costs incurred for production and marketing, except of the major cash crops. There are scarce opportunities for off farm activities in the area. There are family members with either regular or casual employment in 16% of households, while only 8% of the households are with family members engaged in self-employment such as petty business. As for the household expenditures, 71% of the households spent on food, 69% on medication, 64% on education, and 55% on daily consumables. Again, the detailed amount spent were not remembered nor disclosed by the respondents. Among the various expenses, spending on food items is considered as most pressing to their household account by 28% of the respondents, while 23% feel the educational costs are the heaviest expenditure.

Food shortage is a common phenomenon among the interviewed farmers, as 50% of the respondents experienced food shortage for two to three months during the last one year, and 21% suffered even for four to five months, while there was only 17% who did not have a food shortage problem throughout the year.

5.2.3 Rice Production

All of the 99 farmers interviewed were engaged in rice production, and 98 farmers could harvest during last one year, as one farmer in Mundamunda lost the crop due to the flooding of his paddy field. Many of the respondents cultivate both in irrigated areas and in rain-fed lowland; there are 94 households who cultivate rice in irrigated areas, while 37 households in non-irrigated areas. The areas planted with rice vary from 0.2 to 7 ha for the irrigated plots, while 0.25 to 2 ha for the non-irrigated plots, though the accurate measurements of the land area were available only for a part of the non-irrigated plots. Average yield is 1.45 ton per hectare. Breakdown of the number of households, land area and yield per irrigation scheme are shown in the Table 5.4. The utilization rate of irrigated plots is 88%, i.e., a total of 75.2 ha cultivated against 85.5 ha owned by the respondents.

Table 5.4: Rice Farming Households, Areas of Cultivation and Yields

Scheme	No. of HH produced rice	No. of HH harvested	No. of HH sold rice	Average areas cultivated (ha)			Average yield per ha (ton)
				Total	Irrigated	Non-irrigated	
Intabo	55	55	28	0.87	0.63	0.26	1.09
Mundamunda	44	43	37	1.08	0.95	0.15	1.80
Total	99	98	65	0.96	0.76	0.20	1.45

More than 40% of the interviewed farmers grow more than 1 variety of rice, probably for risk minimization. The farmers prefer local aromatic varieties for their own consumption to the high yielding improved varieties such as ITA and C4. The most popular variety is a local variety called Chupa, grown by 64% of the respondents. A majority (94%) of respondents used the seed that they produced in the previous cropping season. The farmers rarely applied agro-inputs in their rice production; there was only 1 respondent in Mudamunda who utilized 25 kg of certified seeds obtained from SEMOC for his 0.5 ha of land. The available labor force in each household for rice production varies from 1 to 7 persons, with 2.3 persons on average. Laborers for rice production activities were hired by 42% of the households; the ratio of those who hired the labor is much higher in Mundamunda with 64% than in Intabo with 26%. It was shared during the group discussion that some small scale producers work in the paddy fields of the others as laborers at the high time of transplanting, weeding and harvesting, leaving their own fields to other members of the family. The tractor service is needed for the

initial and succeeding land preparation, which costs MT 1,450 to 1,600 per ha.

It is to be noted in terms of the marketing that 33 out of the 98 households (34%) could not sell the produce because they could not find any buyers. This is a serious problem particularly in Intabo, where 49% of interviewed rice producers could not sell. Among those who could sell their produce, 73% answered that the buyers came to the collection depot set in the villages to buy their produce. There are only a limited number of buyers in the locality, such as CAIMOC and a local farmer's cooperative called Modhe-mone. Farmers have difficulty to ensure their marketing channel, because these local buyers seem to have problem of management and they could not buy all of the amount that the farmers would like to sell. The total volume of the produce sold by the respondents was about 33 tons, equivalent to 26% of the total yield, with average selling price of MT 6.66 per kg.

5.2.4 Other Farm Activities and Support Services

With limited scale and subsistent nature of rice production, 59% of respondents grow various other crops. Major upland crops grown in the area are cassava, yam, sweet potatoes, maize and vegetables. The farmers also grow fruit trees such as banana, coconut, cashew, and citrus. Livestock rearing is commonly observed, although the number of animals is generally small; 79% of the households keep any chicken, ducks, goats and pigs. These upland crops, fruits and livestock are primarily for home consumption, but they are also sold in a small volume at the local markets as well as within the villages to cope up with any unexpected needs for cash income.

The farmers in the area hardly own farm tools and equipments; 73% of the respondents do not own any farm tools except for the traditional knives or spade. There are only a very limited number of respondents in Mundamunda who own manual threshers and hand tractors.

The sources of information on agricultural technologies are also limited in the area. Nearly one-fifth (19%) of the respondents answered that they have not received any information related to the farm activities from any source. Farmers of 34% of households obtain information from relatives, 26% from radio, while only 8% had access to extension services. Agricultural credit is not popular among the interviewed farmers, as only 10 cases were reported in the survey, and 5 cases among them are the loans from Fondo Inicial Local (FIL), which is not primarily designed to support production activities of farmers.

As the major problem in their farm activities, 36% of the respondents raised insufficiency of labor, and 23% raised shortage or excess of irrigation water. Marketing is considered as another bottleneck for their farm activities by 13% of the respondents. Common prospects among the respondents for their farm activities in future include the expansion of the production scale (59%) and ensuring of marketing channels (9%), while 10% of the households are somehow apathetic, answering that they would continue what they have been doing without any expectation for positive changes.

6. Major Issues for Rice Development in Mozambique

A summary of the current situation and major issues for rice development in Mozambique is presented in Table 6.1 in the following pages.

Table 6.1: Major Issues for Rice Development in Mozambique (Draft)

	Present Situation	Issues for Development	Necessary Support	JICA's Possible Support	Other Donors
1. Overview	<p>(1) 90% of rice is produced by smallholder farmers. They are mostly subsistence, dependent on rainfed production and vulnerable to droughts and floods.</p> <p>(2) Major producing provinces are Zambézia and Sofala.</p> <p>(3) While rice production has long stagnated, rice import has rapidly increased since the early 2000s. Rice production and import were 104,700 tons and 425,600 tons, respectively, in 2007 (FAOSTAT). Per capita consumption also increased from less than 10kg in the 1990s to 22kg in 2007.</p> <p>(4) It does not seem to be an immediate threat to national-level food security, but it would be significant to enhance household-level food security of subsistence rice farmers and the urban poor.</p>				
2. Policies and Programs	<p>(1) PROAGRI-II (2006-2010)</p> <p>(2) Strategy for Green Revolution (2007-)</p> <p>(3) PAPA (2008-2011)</p> <p>(4) NRDS (2008-2018)</p>	<p>(1) Scrutinization of NRDS</p> <p>(2) Securing financial resources <Long-term Issues></p> <p>(3) Establishment of MIS and M&E system</p>	<p>(1) Revision of NRDS</p> <p>(2) Coordination within GoM and with donors for funding</p>	<p>(1) Technical assistance for the revision of NRDS</p> <p>(2) Provision of funds to PROAGRI-II</p>	<ul style="list-style-type: none"> •Funding for PROAGRI-II •Study on rice competitiveness assisted by the Italian government (needs an update) •Institutional support and capacity development by PROIRRI (WB)
3-1. Rice Cropping	<p>(1) Factors other than cultivation technique often limit rice yield.</p> <p>(2) Rice fields are not feasible to alternative cropping.</p> <p>(3) Rice fields are located in unfavorable conditions, though the soils are fertile.</p> <p>(4) Cropping season greatly varies depending on precipitation.</p> <p>(5) Low input cultivation</p> <p>(6) Local varieties that have adapted to respective natural condition are preferred by the locals.</p> <p>(7) Different varieties are simultaneously cultivated to avert risks.</p> <p>(8) The locals preferred the accustomed taste for traditional rice varieties.</p> <p>(9) Seeds by self-multiplication are used.</p> <p>(10) Rice fields are far from residential areas.</p>	<p>(1) Rehabilitation of irrigation and drainage system</p> <p>(2) Improvement of cultivation technique</p> <p>(3) Mechanization</p>	<p>(1) Strengthening of collaboration with other aid programs</p> <p>(2) Appropriate rehabilitation of irrigation and drainage system</p> <p>(3) Improvement of cultivation technique based on respective farming scale</p>	<p>(1) Appropriate rehabilitation of irrigation and drainage system</p> <p>(2) Improvement of cultivation technique</p>	<ul style="list-style-type: none"> •PROIRRI •PROAGRI

	Present Situation	Issues for Development	Necessary Support	JICA's Possible Support	Other Donors
3-2. Farm Management	<p>(1) Most of the farmers work on subsistence farming.</p> <p>(2) Rice is a supplemental crop after cassava and maize as staple crops.</p> <p>(3) Rice farmers are mostly women.</p> <p>(4) More than one hectare is required for profitable rice cropping.</p> <p>(5) Many of the households have a major income source other than rice cropping.</p> <p>(6) Self-help activities in rural community is insufficient.</p> <p>(7) Post-harvest technique is underdeveloped.</p> <p>(8) Rice is mostly sold in local markets.</p>	<p>(1) Improvement of agricultural technology based on respective farming scale.</p> <p>(2) Technological improvement from the perspective of entire agricultural management.</p> <p>(3) Improvement of farm management technique by respective rural community.</p> <p>(4) Improvement of cropping system</p> <p>(5) Improvement of post-harvest technique</p>	<p>(1) Planning of aid program based on respective farming scale</p> <p>(2) Empowerment of farm management technology by rural communities</p> <p>(3) Empowerment of entire farm management technique including rice cropping</p> <p>(4) Research on cropping system in favor of farmers</p> <p>(5) Improvement of post-harvest techniques</p>	<p>(1) Dispatch of agricultural policy advisers to central and district administration offices</p> <p>(2) Dispatch of an expert in charge of strengthening of farmers associations.</p> <p>(3) Dispatch of experts in charge of specific fields including rice cropping</p>	<ul style="list-style-type: none"> •PROIRRI •PROAGRI
4.1. Support Service: Research	<p>(1) Rice research is inadequately implemented under IIAM.</p> <p>(2) IRRI has implemented a rice breeding program in seven southeastern countries, but the budget and the operation system is insufficient.</p>	<p>(1) Establishment of research system</p> <p>(2) Fostering researchers</p> <p>(3) Breeding of appropriate variety in each region</p> <p>(4) Improvement of appropriate technology in each region</p>	<p>(1) Structuring of research system</p> <p>(2) Fostering researchers</p> <p>(3) Strengthening collaboration with other research organizations</p> <p>(4) Support improvement of research capability</p>	<p>(1) Strategy making of agricultural research</p> <p>(2) Support in specific research fields</p>	<ul style="list-style-type: none"> •IRRI •PROIRRI •PROAGRI
4.2. Support Service: Extension	<p>(1) Extension system in district governments is generally incomplete.</p> <p>(2) Only 671 extension workers are available in 127 districts of the country (2009), though an increase in personal were intended by the Ministry of Agriculture.</p> <p>(3) Technical knowledge of extension workers is not sufficient.</p>	<p>(1) Strengthening of extension system</p> <p>(2) Fostering extension workers</p>	<p>(1) Strengthening of extension system</p> <p>(2) Fostering extension workers</p> <p>(3) Improvement of collaboration with other aid organizations</p>	<p>(1) Fostering extension workers</p> <p>(2) Fostering facilitators among farmers</p>	<ul style="list-style-type: none"> •PROAGRI •PROIRRI •NGO (World Vision, ORAM, etc.)
4.3. Support Service: Seed Production	<p>(1) Genuine varieties are rarely obtained because of repeated self-seed production by farmers.</p> <p>(2) Seeds produced by a private company (MIA); by a public corporation (SEMOC); and by farmers' cooperations, and seeds bought from farmers by SEMOC are used as seed rice. Nevertheless, the amount, the quality, and variability are insufficient.</p> <p>(3) Neither certified seed production nor seed quality inspection schemes have been established.</p> <p>(4) Certified seeds adopted to respective region have not been produced.</p>	<p>(1) Purification of varieties</p> <p>(2) Establishment of certified seed production and the inspection system</p> <p>(3) Establishment of certified seed supply system</p>	<p>(1) Survey on adopted varieties in each region</p> <p>(2) Purification of used varieties</p> <p>(3) Establishment of certified seed production system adopted in each region</p> <p>(4) Strengthening of collaboration with other organizations</p>	<p>(1) Survey on local varieties</p> <p>(2) Dispatch an expert in charge of structuring seed purification and breeding system</p> <p>(3) Dispatch of an expert in charge of structuring certified seed production scheme.</p>	<ul style="list-style-type: none"> •IRRI •PROAGRI •USAID

	Present Situation	Issues for Development	Necessary Support	JICA's Possible Support	Other Donors
4.4. Support Services: Rural Finance	<p>(1) Lack of rural finance due to structural factors: 1) a predominance of subsistence farming; 2) extensive poverty level; 3) low population density; 4) agriculture frequently affected by droughts and floods; 5) high and volatile real interest rates; and 6) long years of civil war. The attempts of the govt and donors to establish rural finance have so far had only a marginal impact.</p> <p>(2) The only successful case is found in the Chókwè Irrigation Scheme because of the presence of a longstanding rice mill in Palmeira, Maputo Province.</p> <p>(3) Rice milling companies can obtain loans from GAPI.</p>	<ul style="list-style-type: none"> •Improvement of rural finance is necessary but may be difficult in the short term. 	<p><Long-term></p> <ul style="list-style-type: none"> •Expansion of rural finance 	None for the next 10 years	<ul style="list-style-type: none"> •Support for improving access to finance by PROIRRI (WB) •Rural finance project by IFAD •Support for Microfinance by NGOs
4.5. Spt Services: Mkt Information	<p>(1) MINAG has SIMA but the information reaches only a limited number of producers.</p> <p>(2) Esoko is being piloted by TechnoServe in Nampula Province.</p>	<ul style="list-style-type: none"> •Expansion of information services by radio and mobile phones (esoko can be accessed by mobiles). 	<ul style="list-style-type: none"> •Improvement of market information 	None for the next 10 years	<ul style="list-style-type: none"> •SIMA was assisted by USAID from 1991 to 2000. •Esoko is promoted by USAID and FAO.
5. Marketing	<p>(1) The most critical issue for rice development in Mozambique is that the supply of domestically grown rice in the market is limited and volatile, reflecting the generally unstable production dependent on rainfalls.</p> <p>(2) The largest rice mills in the country are one located in Palmeira, Maputo Province and another in Chókwè, Gaza Province. Both process rice from the Chókwè Irrigation Scheme.</p> <p>(3) There are small-scale private mills operating in areas where some quantity of rice is available for marketing, but they are not so efficient as larger mills.</p> <p>(4) In the imported rice market, an adequate quantity is supplied for the whole year at a relatively lower price for standardized quality.</p> <p>(5) A serious problem in the marketing of locally grown rice is lack of finance for purchasing paddy.</p>	<p>(1) It is first and foremost important to establish stable and sufficient supply of locally grown rice. The marketing channels for imported rice could be utilized.</p> <p>(2) Improvement of post-harvest techniques</p> <p>(3) Improvement of rice milling techniques</p> <p><Long-term issues></p> <p>(4) Increased finance for the rice milling industry</p> <p>(5) Improvement of rural roads</p> <p>(6) Establishment of quality standards</p>	<p>(1) Development of production infrastructure and technologies(2) Improvement of supply and demand analysis</p>	None for the next 10 years	<ul style="list-style-type: none"> •Support for the value chain by PROIRRI (WB) •Improvement of rural markets by IFAD •Study on rice competitiveness assisted by the Italian government (needs an update) •USAID's support to NGO (CLUSA, CARE, TechnoServe, etc.) for improvement of agricultural marketing

	Present Situation	Issues for Development	Necessary Support	JICA's Possible Support	Other Donors
6. Irrigation development	<p>(1) Huge irrigated farm lands was abandoned and/or heavily deteriorated due to wars for 17 years; many skilled management staff and trained farmers left these areas.</p> <p>(2) Regeneration (rehabilitation / upgrading) progress of irrigated farm lands by small scale farmers thru organization of themselves and installing new pumps with assistance of both the Government and foreign aides is slow.</p> <p>(3) Although irrigation development is indispensable for realizing stable production in wet seasons and increasing production in dry seasons, nos of engineers for the work is very few and budget is very limited.</p> <p>(4) Some irrigation schemes recently constructed or under construction with foreign aid are given higher priority to quick return of investment.</p> <p>(5) It seems there is high potential for further irrigation development considering availability of land and water resources.</p>	<p>(1) Securing irrigation engineers and their staff for preparing survey, design and implementation of irrigation schemes is most critical</p> <p>(2) Preparing planning and design guideline for sustainable irrigation development by small holders is needed for efficient and smooth implementation of schemes</p> <p>(3) Developing low lifting head pump with higher energy efficiency and lower maintenance cost is indispensable for easing farmers problems in running, repair and replacement of pumps in low lying area</p>	<p>(1) Support to provide necessary budget to deploy the proper numbers of irrigation engineers</p> <p>(2) Increasing and training up the technical staff for irrigation development</p> <p>(3) Preparation of survey and planning guidelines</p> <p>(4) Introduction of high efficiency pumps for rice production areas</p> <p>(5) Revision and updating the National Irrigation Development Master plan giving priority to rehabilitation and upgrading the existing schemes</p> <p>(6) Inventory survey to prepare the development plan</p> <p>(7) Design and cost estimate of irrigation projects according to the Master Plan</p> <p>(8) Provision of required budget for the implementation</p>	<p>(1) Dispatching irrigation experts to Ministry of Agriculture and Provincial governments for assisting in; (i) training of local engineers, (ii) preparation of planning and design guidelines, (iii) implementing model schemes with local engineers, and (iv) preparing financial proposals for the projects,</p> <p>(2) Updating and revision of the 1993 National Irrigation Development Master Plan</p> <p>(3) Development and actual proofing the high efficiency low head pumps for low lying areas</p>	<p>- AfDB (SSIP)</p> <p>- WB/ IDA (SIDP, PROAGRI)</p> <p>- BID (Chokwe)</p> <p>- EU (Drought mitigation)</p> <p>- Italy (PIDA)</p> <p>- Holland (Nante area)</p>

Appendix I: Timetables of the Study

Month	Date	Major Activity	Stay	
July	27	Mon	Report to JICA Office	Maputo
	28	Tue	MINAG-DNEA	Maputo
	29	Wed	MINAG-DNSA; World Bank; IRRI (@JICA)	Maputo
	30	Thu	IIAM; World Vision; MINAG-DE; African Development Bank	Maputo
	31	Fri	Workshop on P4P and SIMA (@IIAM); DPA-Maputo; Grupo Moçfer	Maputo
Aug	1	Sat	Preparation of minutes and literature review	Maputo
	2	Sun	Preparation of minutes (Ms. Hitsuda and Ms. Itagaki: Arrival in Maputo)	Maputo
	3	Mon	Team Meeting; Delta Corporation (rice importer)	Maputo
	4	Tue	Moving to Xai-xai; DPA-Gaza; Moving to Chókwè	Chókwè
	5	Wed	HICEP; Moçfer Industrias Alimentares (MIA) (farms, seed factory; mill, etc.)	Chókwè
	6	Thu	IIAM Chókwè Experimental Station; Interview with farmer in Chókwè Scheme	Chókwè
	7	Fri	Inacio de Sousa (rice mill in Palmeira); Moving to Maputo	Maputo
	8	Sat	Mr. Zandamela (rice expert of MINAG-DNEA); Team meeting	Maputo
	9	Sun	Preparation of minutes and literature review	Maputo
	10	Mon	Moving to Beira; DPA-Sofala; Delta Trading (rice importer)	Beira
	11	Tue	Beira City (interviews and field visit)	Beira
	12	Wed	Dondo District (interviews and field visit)	Beira
	13	Thu	Buzi District (interviews and field visit) (Mr. Okada: Arrival in Maputo)	Beira
	14	Fri	DPA-Sofala; Africom (rice importer); Moving to Maputo (Mr. Okada) MINAG-DNSA; MOPH-DNA; IIAM	Maputo
	15	Sat	Preparation of minutes and literature review; (Mr. Okada) Matuituine District	Maputo
	16	Sun	Team meeting; Moving to Quelimane	Quelimane
	17	Mon	AM DPA-Zambézia; GPZ-Zambézia	Quelimane
	18	Tue	Nicoadala and Namacura Districts (interviews and field visit), World Vision	Quelimane
	19	Wed	Mopeia District (interviews and field visit); Moving to Morrumbala	Morrumbala
	20	Thu	Morrumbala District (interviews and field visit)	Quelimane
	21	Fri	Maganja da Costa District and Nante Scheme (interviews and field visit)	Quelimane
	22	Sat	Casa Confiança (rice distributor); Agro Matuel Comercial (input trader)	Quelimane
	23	Sun	Preparation of minutes and literature review	Quelimane
	24	Mon	DPZ-Zambézia; CAIMOC; Markets in Quelimane City, Zambézia Rice Research Center; Associação de Promoção de Agricultura Comercial (APAC), World Vision-Zambézia; Inter Globe (rice distributor); Team meeting	Quelimane
	25	Tue	Report to DPA-Zambézia and GPZ-Zambézia; Moving to Maputo	Maputo
	26	Wed	Moving to Nampula; DPA-Nampula	Nampula
	27	Thu	Angoche District (interviews) (Ms. Itagaki: Travel back to Japan)	Angoche
	28	Fri	Angoche District (interviews and field visit); Moving to Nampula; CLUSA	Nampula
	29	Sat	Markets in Nampula City	Nampula
	30	Sun	Moving to Pemba	Pemba
	31	Mon	DPA-Cabo Delgado; Markets in Pemba City; Interview with Italian Consultant	Pemba
Sept	1	Tue	Balama District (interviews and field visit to Chipemba Irrigation Scheme)	Pemba
	2	Wed	Muidumbe District (interviews and field visit to Nguri Irrigation Scheme)	Pemba
	3	Thu	Pemba Metuge District (interviews and field visit to rainfed rice growing areas)	Pemba
	4	Fri	Report preparation; Moving to Maputo	Maputo
	5	Sat	Report preparation	Maputo
	6	Sun	Report preparation; Team meeting;	Maputo
	7	Mon	(Mozambican national holiday) Report preparation	Maputo
	8	Tue	MINAG-DNSA; INE; Central Market; Report preparation	Maputo
	9	Wed	Report preparation Report to JICA Office	Maputo
	10	Thu	Report preparation; Report to Japan ODA-TF	Maputo
	11	Fri	MINAG-SIMA; MINAG-DNSA; Report preparation	Maputo
	12	Sat	(Ms. Emoto and Mr. Okada: Travel back to Japan)	Maputo
	13	Sun	Final report preparation	Maputo
	14	Mon	Final report preparation; Supplementary interviews and data collection	Maputo
	15	Tue	Final report preparation; Supplementary interviews and data collection	Maputo
	16	Wed	Final report preparation; Supplementary interviews and data collection	Maputo
	17	Thu	Final report preparation; Supplementary interviews and data collection	Maputo
	18	Fri	(Ms. Hitsuda: Travel back to Japan)	Maputo

Note: Activities and places of stay shown above are mainly for Ms. Emoto and Ms. Hitsuda. They varied according to the assignments of each member.

Appendix II: Person Interviewed in Mozambique

(1) Maputo City

1) Ministry of Agriculture (MINAG)

Dr. José António Gaspar, National Director of Agricultural Extension
Mr. Boaventura F. Nuvunga, National Director of Agricultural Services
Mr. Victorino Xavier, Director of Agricultural Economy
Mr. Carlos B. Zandamela, Agronomist, National Directorate of Agricultural Extension
Mr. A. António Nhabetse, Civil Engineer, Head of Hydraulics Engineering Department
Mr. Paulino Balate, Irrigation Technician, Hydraulics Engineering Department
Mr. António Paulo, Agricultural Market Information System (SIMA)

2) Ministry of Public Works and Housing

Mr. Delario Joses Sengo, Manager of Water Resources, Water Resource Management Department, National Directorate of Water

3) Institute of Agrarian Research of Mozambique (IIAM)

Dr. Calisto A. L. F. Bias, Director General
Mr. Moises F. Vilanculos, Soil Surveyor

4) World Bank Mozambique Country Office

Dr. Daniel Libório da Cruz e Sousa, Agriculture Service Specialist

5) African Development Bank Mozambique Regional Office

Mr. César Tique, Agriculture and Rural Development Specialist

6) International Rice Research Institute, East and Southern African Regional Office

Dr. Joseph F. Rickman, Representative

7) World Vision Mozambique

Mr. Abu Yarmah, Agricultural Program Director
Mr. Francisco Junior Matuca, Program Officer

8) Grupo Moçfer, S.A

Mr. Arnaldo Ribeiro, Executive Vice-Chairman

9) Aquifer Ltd.

Mr. Ademola Adesina (based in London, UK)

10) Delta Corporation

Mr. Firoz Rawjee, Chief Operating Officer

11) TechnoServe Inc. Mozambique

Mr. Ali-Cherif Deroua, Consultant

(2) Maputo Province

1) Provincial Directorate of Agriculture

Mr. António Sabão, Chief, Provincial Service of Agriculture

2) Matutuine District

Mr. Elias Cuna, Extension Officer

3) Inácaio de Sousa

Mr. Dias de Sousa, Owner/Manager

(3) Gaza Province

1) Provincial Directorate of Agriculture

Mr. Octavio Muhate, Acting Provincial Director of Agriculture

Mr. André Langa, Acting Chief, Provincial Service of Agriculture

Mr. Sebastião Ferro, Provincial Service of Agriculture

Mr. Manuel António Langa, Provincial Service of Rural Extension

Mr. José Romeu Matavele, Department of Administration and Finance

Mr. Manuel Tinga, Irrigation Technician

2) Chókwè District

Mr. Alberto Banguine, Director, SDAE

Mr. Artur João Muchave, Farmer

3) Hidráulica de Chókwè E. P. (HICEP)

Mr. Salomão Matsule, President, Council of Administration

Mr. Fanuel Mabunda, Administrator

Mr. Roberto Lumbele

Mr. Alberto Banguine, Director of Water Resources

4) Chókwè Research Station, South Zonal Center, IIAM

Ms. Celestina Jochua, Director

5) Moçfer Industrias Alimentares (MIA)

Ms. Virginia Aguiar, Marketing Manager

Mr. António Jorge, Research and Development Director

Ms. Maria Estrela Alberto, Research and Development, Rice Breeding

Ms. Lorena Adam, Research and Development

6) Pereira & Santos, Chókwè

Mr. Ilidio Antonio, Manager

(4) Sofala Province

1) Provincial Directorate of Agriculture

Mr. Jacinto Tualfo, Chief, Provincial Service of Geography and Cadastre

Mr. Nelson R. António, Chief, Provincial Service of Agriculture

Mr. Arwando D. Cawissa, Chief, Provincial Service of Rural Extension

Mr. Miguel L. Coimbu, M&E

Mr. Inacio Tatu, Technician of Provincial Service of Agriculture
Mr. Ravy Serra, Irrigation Engineer

2) Beira City

Mr. Boadia Jabirão Simbine, Director, SDAE
Mr. Jorge Vilanclo Augussio Manuel Renelis, Extension Supervisor

3) Dondo District

Mr. Boadia Jabirão Simbine, Director, District Service of Economic Activity (SDAE)
Mr. Jorge Vilanclo Augussio Manuel Renelis, Extension Officer, SDAE
Mr. Paulo Tomo, Farmer
Ms. Maria Orlanda Sanoe, Farmer

4) Buzi District

Ms. Henriqueta do Rosário, Permanent Secretary, District Government
Mr. Valdemar G. Schuwarts, Director, SDAE
Mr. Cristóvão Rogério Guta, Planner/Technician, SDAE
Mr. Filipe Araújo Madjiga, Extension Officer, SDAE
Members of Farmers Associations (seven women and one man)

5) Delta Trading Cia, Lda., Beira Branch

Mr. Ranjan Singh, General Manager

6) Africom Lda. Beira Branch

Mr. Hiran Shah, Sales Manager

(5) Zambézia Province

1) Provincial Directorate of Agriculture

Mr. José Varimelo, Provincial Director of Agriculture
Mr. Julio Frederico Roda Chibale, Chief, Department of Administration and Finance
Mr. Carlos Nedissone, Provincial Service of Agriculture
Mr. Braz Anselmo, Irrigation Engineer, Provincial Service of Agriculture
Mr. Manuel Magombe, Provincial Coordinator
Mr. Clementino F. Mariano, Surveyor of Agricultural Prices (for SIMA)

2) Zambezi Valley Development Authority (GPZ)

Mr. Bonifácio Gruveta Massamba, Coordinator
Mr. Hassane Rachide, Deputy Coordinator
Ms. Isabel M.V. da Rocha, Agronomist
Mr. Virgílio A. G. Dinheiro, Chief, UGP-Nante

3) Nicoadala District

Mr. Hilario Costa, Director, SDAE
Mr. Nel da Graça B. Impaia, Technology Officer
Mr. João Mario Manfundissi, Rice Extension Officer
Mr. Fonseca Mangacão, Block Chef, Mucelo
Mr. João Ernesto José, President, Associação 4 de Outubro, Mucelo Irrigation Scheme
Ms. Helena Francisco, Fiscal Officer, Associação 4 de Outubro, Mucelo Irrigation Scheme

Mr. Celestino Augusto Camoes, Member, AMUCEMA

4) Namacura District

Mr. Oscar Mulugo, Director, SDEA
Members of Associação de Camposeses Anaiba-Truzão

5) Mopeia District

Mr. Ernesto Paulino, Director, SDAE
Mr. Isaac Manuel Companhia, Extension Officer, SDAE
Ms. Maria Lucia Tomo, President, Associação Agrícola de Paz

6) Morrumbala District

Mr. Modame Mussa, Director, SDAE

7) Maganja da Costa District

Mr. Reves L.J. Minesses, Director, SDAE
Mr. Edrice Lazize Mote Auxiliar, Administration, SDAE
Ms. Acissa Abdul Cassimo, Chief, Nante Administrative Post
Mr. António Gonçalves, Chairman, Intabo Water Users Association, Nante
Mr. Ally A. Machona, Manager, Associação Feminia
Ms. Gelita Wmpe, Member, Associação Feminia
Mr. Augusto Mariano, Extension Worker, ORAM-Associação Rural de Ajude Mutua

8) Zambézia Rice Research Station, IIAM

Mr. Jose Magia, Rice Breeder
Mr. Francisco Alberto Amela, Rice Breeder

9) Companhia Agro-Industrial de Moçambique Lda. (CAIMOC)

Mr. Mr. Hassane Rachide, Acting General Manager (Deputy Coordinator, GPZ)
Mr. Amilton Cardoso, Nante Factory Manager

10) Associação de Promoção de Agricultura Comercial (APAC)

Mr. Pradeep Kumar Vasudevan, Manager, EOZ-APAC-Nicoadala
Mr. Jan de Moor, Advisor
Mr. Adri van den Dries, Irrigation Engineer, CDP
Mr. Gertjan Beck, Consultant

11) World Vision, Zambéiza

Dr. Brian Hilton, Provincial Manager/Agriculture Coordinator
Mr. Pedro Jocé Pedro, Assistant, HIV/AIDS Program, Namacura

12) CeLIM (Rural Development Project in Mopeia)

Mr. Marco Andreoni, Project Manager
Mr. Venancio Iocheremua, Extension Worker
Mr. Ibraimo Alfane Omar, Extension Worker

13) Agro Matuel Comercial

Mr. Ranjan Singh Ilidio de Matuel Cuambe, Owner

Mr. Elenio Pedro Paulo Erreira, Salesclerk

14) Casa Confiança

Mr. Ashraf, Owner/General Manager

15) Inter Globe, Quelimane Branch

Mr. Pathan Inalyat Khan, General Manager

(6) Nampula Province

1) Provincial Directorate of Agriculture

Mr. Mahomed Rafik H. L. Valá, Provincial Director of Agriculture

Mr. João Duarte, Chief, Provincial Service of Agriculture

2) Angoche District

Mr. Afonso Muialete, Chief, Truism Section, SDAE

Mr. Antonio Lopes Puanusso, Director, District Service of Education, Youth and Technology

Ms. Mariama Ossufo, Farmer, and other 10 farmers

Mr. Batista Assan, Rice Mill Operator

Mr. Martin Pedro, Boila-Nametória Administrative Post

Mr. Abdra Antonio Jamala, Technician of Production and Marketing, Associação de Olima

3) CLUSA Cooperative Development Program

Mr. Carlos Alberto Sánchez Perez, Project Manager

Mr. Helculano Ricardo, Technician

Mr. Abdul Amisse Muçama, Technician

(7) Cabo Delgado Province

1) Provincial Directorate of Agriculture

Mr. Oliveira Amimo, Provincial Director of Agriculture

Mr. Dionisio Cossa, Provincial Service of Geography and Cadastre

Mr. Njaime Ntepa, Provincial Service of Agriculture, Crop Production/ Phyto-sanitary

Ms. Judite I-Vendo, Provincial Service of Agriculture

2) Balama District

Mr. Adelino Jacob, Director, SDAE

Mr. Silvério Marcos Muçipo, Empresa Agraria de Chipembe (1983-1988)

3) Muidumbe District

Ms. Rita de Jesus João, Director, SDAE

Mr. Ussene Bormuda, Extension Officer

Mr. Elias Antonio Acarimoca, Chief, Aldeia Nguri

Mr. Yacob Dadi Nampunde, Farmer

4) Pemba Metuge District

Mr. Manuel dos Santos Mateto, Director, SDAE

Mr. Paulo Joaquim Anaunama, Extension Officer

Mr. Bachirna Bacar Sumana, Chief, Aldeia 25 de Junho