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ASSESSMENT OF LAND RESOURCES FOR RAINFED CROP PRODUCTION IN MOZAMBIQUE

CLIMATIC RESOURCES INVENTORY OF MOZAMBIQUE

LAND AND WATER USE PLANNING PROJECT
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CLIMATIC RESOURCES INVENTORY OF MOZAMBIQUE

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PUBLICATIONS IN THIS SERIES

This report is the third of a series of six reports prepared to record the activities and results of the study entitled "Assessment of land resources for rainfed crop production in Mozambique". The work plan of the study is given in the Consultants' Report of Kassam and Van Velthuizen (1981), and the six reports of the series are:

1. Land utilization types and ecological adaptability of crops.

2. Climatic data bank and length of growing period analysis.

3. Climatic resources inventory of Mozambique.

4. Land resources inventory of Mozambique.

5. Agro-climatic and agro-edaphic suitabilities for rainfed crop production in Mozambique.

6. Land suitability assessment:

   Vol. I. Methodology and country results.
   Vol. II. Province results.

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ASSESSMENT OF LAND RESOURCES FOR RAINFED CROP PRODUCTION IN MOZAMBIQUE

CLIMATIC RESOURCES INVENTORY OF MOZAMBIQUE

ABSTRACT

The report describes the climatic resources inventory compiled for the study. The inventory is a quantification of the climatic parameters that relate to crop adaptability characteristics (crop climatic requirements) and provides the basis for crop-specific agro-climatic suitability assessments.

The climatic inventory quantifies the prevailing moisture and temperature regimes. Moisture regimes are defined through the concept of the length of growing period and include a quantification of variability based on historical records. Temperature regimes are defined in terms of thermal zones matched to crop requirements and takes account of temperature seasonality.

The mapped climatic resources inventory (1:2 million scale) is included in the report together with country summaries of the distribution of moisture and thermal zones.

AVALIACAO DOS RECURSOS DA TERRA
PARA PRODUCAO EM SEQUIRO DAS CULTURAS EM
MOCAMBIQUE

LEVANTAMENTO DOS RECURSOS CLIMÁTICOS DE MOCAMBIQUE

SUMÁRIO

O relatório apresenta o levantamento dos recursos climáticos efectuados para o estudo. O levantamento é uma quantificaçao dos parâmetros climáticos que sao relacionados com as exigências climáticas de culturas e constitui a base para a avaliaçao da aptidao agro-climática por cultura específica.

O levantamento climático quantifica os regimes predominantes de humidade e temperatura. Regimes de humidade sao definidos por uma quantificaçao de variabilidade baseado em dados históricos. Regimes de temperatura sao definidos em termos de zonas térmicas relacionadas com exigências das culturas e também tomou-se em conta da variaçao da temperatura em estaçoes diferentes.

A carta do levantamento dos recursos climáticos (escale 1:2 milhoes) é incluída no relatório junto com sumários ao nível nacional da distribuiçao de zonas definidas com base na humidade e com base nas características térmicas.

1. INTRODUCTION

The first report in this series of six reports described the land utilization types of the study[1] and ecological adaptability of rainfed crops. The second report described the climatic data bank developed for the study and the analysis of growing period. This is the third report in the series and deals with the climatic resources inventory compiled for the study.

Agricultural productivity from a given land utilization type can be analysed as an input/output system. To achieve such an analysis on a quantitative basis, it is necessary to quantify the relationship between the ecological requirements of the crops and ecological characteristics of the environment (climate, soil) within the framework of the land utilization types under consideration.

This report describes the climatic resources inventory of Mozambique created for the study. The inventory is a quantification of the climatic parameters that relate to crop adaptability characteristics described in Report No. 1 and provides the basis for the agro-climatic suitability assessment described in Report No. 5.

2. CONCEPTS OF THE CLIMATIC INVENTORY

Temperature and water are the major climatic factors that govern distribution (both in space and time) of crops. In combination with the solar radiation, these climatic factors condition the net photosynthesis and allow the plants to accumulate dry matter (and accomplish the successive development stages) according to the rates and patterns which are specific to the main groups of cultivated plants as described in Report No. 1.

While present knowledge does not allow full quantification of all agronomic consequences of climate in relation to crop adaptability and production, a number of important crop/climate relationships can be quantified in order to allow:

(i) an assessment of the influence of climate on the spatial and temporal distribution of the crops of the study, and

(ii) the production that can be attained under conditions that are free from constraints.

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1 Crops of the study are: maize, sorghum, pearl millet, wheat, soybean, groundnut, cassava, cotton.

The growing period has been used as the framework for the assessment of climatic resources. It is defined as the period in which temperature and moisture supply permit crop growth.

To take into account crop temperature requirements, prevailing temperature regimes have been inventoried by identification of thermal zones.

The inventory of climatic resources allows:

(i) a differentiation of the country into thermal zones, reflecting the geographical and seasonal distribution of the prevailing temperature regimes;

(ii) a differentiation of the country into length of growing period zones, reflecting the prevailing moisture regimes including the year-to-year variations;

(iii) a quantification of potential crop yields that can be attained under constraint-free conditions (as described in Report No. 5);

(iv) an assessment of various agro-climatic constraints to take into account yield losses likely to occur (as described in Report No. 5).

The synthesis of the moisture attributes of the inventory has been based on the analysis of historical rainfall records, and average monthly potential evapotranspiration calculated according to the Penman method.

The identification of the thermal attributes of the inventory has been based on mean daily temperature, as related to other temperatures.

The methodology used for the compilation of the climatic resources inventory is described in the following sections, and involves the quantification of the length of growing period (and its variability) and the associated temperature regime.

3. GROWING PERIOD

The definitions and the model used to quantify the length of growing period have been described in Report No. 2. The growing period

is the time period when moisture supply exceeds half potential evapotranspiration; it includes the time required to evapotranspire up to 100 mm of soil moisture storage. The calculation of the growing period is based on a water balance model, comparing rainfall with potential evapotranspiration. The length of growing period from a climatic viewpoint alone, and independent of crop, soil and landform, is therefore quantified in a reference manner.

For the assessment of the moisture regime and the compilation of the climatic inventory, quantification is needed in terms of:

(a) lengths of continuous growing periods and number of such periods per year (pattern, section 3.1);

(b) the year-to-year variability of each length of growing period;

(c) the quality of moisture conditions during the growing period.

3.1 Pattern of Growing Period

To inventory the year-to-year variation in the number of lengths of growing period per year, a historical profile is compiled showing groups of years each with a different number of growing periods per year. The proportional representation of each group in the total historical series is computed.

This information represents the pattern of growing period. Six patterns are recognized in the present study, and the descriptions of these including their composition and extents are presented in Table 1.

The pattern of growing period code represents the number of growing periods per year in order of frequency of occurrence, e.g. in the pattern coded as 2-1-3, the numeral 2 represents the number of lengths of growing periods per year (i.e. two) that occur in the majority of the years (i.e. 45 percent) - the dominant length number; the numeral 1 represents number of lengths of growing periods per year (i.e. one) that has the next most commonly occurring frequency (i.e. 30 percent) - the first associated length number; and the numeral 3 represents number of lengths of growing periods per year (i.e. three) that has the smallest occurrence (25 percent) - the second associated length number.

3.2 Length of Growing Period

The mean length of growing period for each individual group of years, represented in the pattern of growing period make-up, has been

Table 1 PATTERNS OF GROWING PERIODS - HISTORICAL PROFILES OF OCCURRENCE OF NUMBER OF GROWING PERIODS PER YEAR

Code	Proportion (%)	Description	Extents km^2	Extents %
1	100	Occurrence of one growing period per year in all years	121 824	15.7
1-2a	90:10	Occurrence of one growing period per year in 90% of the years (dominant length number), with two growing periods per year in 10% of the years (associated length number)	228 024	29.5
1-2b	75:25	Occurrence of one growing period per year in 75% of the years with two growing periods per year in 25% of the years	126 595	16.4
1-2-3	60:30:10	Occurrence of one growing period per year in 60% of the years (dominant length number), with two growing periods per year in 30% of the years (1st associated length number) and three growing periods per year in 10% of the years (2nd associated length number)	133 523	17.3
2-1-3	45:30:25	Occurrence of two growing periods per year in 45% of the years, with one growing period per year in 30% of the years and three growing periods in 25% of the years	143 263	18.5
2-3-1	55:30:15	Occurrence of two growing periods per year in 55% of the years, with three growing periods per year in 30% of the years and one growing period per year in 15% of the years	20 313	2.6
		TOTAL	773 542	100.0

computed. Where there are more than one length of growing period per year, the total mean length as well as the individual mean lengths (e.g. two, three) are calculated.

For each pattern of growing period, the mean total length of the dominant number is functionally related to the mean total length of the associated numbers. Also, when the mean total length is a summation of more than one mean length, the latter are again functionally related to the former. These relationships are presented in Table 2 for each pattern of growing period.

ble 2 RELATIONSHIPS BETWEEN INDIVIDUAL MEAN LENGTHS OF GROWING PERIODS

Pattern	Relationship	Correlation coefficient (r)
1-2a	$L2 = 0.21 + 0.96\ L1$	0.89
(90:10)	$L2_1 = -17.70 + 0.87\ L2$	0.91
1-2b	$L2 = 29.57 + 0.87\ L1$	0.93
(75:25)	$L2_1 = -37.66 + 0.96\ L2$	0.88
1-2-3	$L2 = 8.30 + 0.92\ L1$	0.95
(60:30:10)	$L2_1 = -5.08 + 0.74\ L2$	0.94
	$L3 = 36.13 + 0.75\ L1$	0.81
	$L3_1 = 4.23 + 0.56\ L3$	0.77
	$L3_2 = 21.95 + 0.16\ L3$	0.76
2-1-3	$L1 = -16.61 + 1.09\ L2$	0.94
(45:30:25)	$L2_1 = -26.28 + 0.82\ L2$	0.97
	$L3 = 47.79 + 0.77\ L2$	0.87
	$L3_1 = 1.71 + 0.49\ L3$	0.92
	$L3_2 = 0.73 + 0.32\ L3$	0.84
2-3-1	$L2_1 = 23.64 + 0.54\ L2$	0.96
(55:30:15)	$L3 = 60.92 + 0.66\ L2$	0.79
	$L3_1 = 6.09 + 0.44\ L3$	0.82
	$L3_2 = 0.62 + 0.30\ L3$	0.83
	$L1 = -34.65 + 1.25\ L2$	0.88

L1 - Total length consisting of one growing period per year

L2 - Total length consisting of two growing periods per year

$L2_1$ - First length of the two growing periods

L3 - Total length consisting of three growing periods per year

$L3_1$ and $L3_2$ - First and second length of the three growing periods respectively

3.3 Variability of Length of Growing Period

In addition to the frequency distribution tables described in Report No. 2, coefficient of variation was calculated to allow a comparison of the variability in the mean length of growing period, and to take into account the likely losses in crop production.

The relationship between individual length of growing period and coefficient of variation was obtained by plotting all values provided by the climatic analysis, and an aggregate relationship is given below.

Length (days)	Coefficient of variation (%)
< 60	> 65
60–74	65
75–89	55
90–119	45
120–149	35
150–179	20
180–209	15
210–239	15
240–269	15
270–299	10
> 300	< 10

3.4 Occurrence of Intermediate Lengths of Growing Periods

From the frequency distribution tables (Report No. 2), occurrence of intermediate lengths of growing periods was quantified by relating P/ET ratio and moisture excess values with length of growing period.

For patterns of growing periods with dominantly one growing period (i.e. 1, 1-2a, 1-2b, 1-2-3), the following relationship exists between the length of growing period and percentage of intermediate growing periods:

Length (days)	Percent Intermediate[1]
30–59	60
60–89	5
90–119	7
120–149	< 1

1 Combined for dominant and associated lengths

For patterns of growing periods with dominantly two lengths of growing periods (i.e. 2-1-3 and 2-3-1), the following relationship exists between the length of growing period and percentage of intermediate growing periods.

Length (days)	Percent Intermediate[1]
30-59	63
60-89	26
90-119	4
120-149	1

[1] Combined for dominant and associated lengths

The ratio P/ET for the intermediate lengths of growing periods of less than 149 days corresponds to values in the range 0.70-0.75.

4. THERMAL ZONES

To identify thermal zones, temperature criteria corresponding to the requirements of the crops were established.

Mean daily temperatures of more than 20°C are regarded suitable for crops from the adaptability groups II and III, while temperatures in the range 15-20°C are regarded suitable for crops from Groups I and IV; temperatures below 15°C are considered suitable for crops from Group I only. These temperature ranges cover the limits of crop distribution. Within each range, differences exist in temperature adaptability within and between crops as detailed in Report No. 5.

To cater for such differences in the compilation of the country inventory of thermal zones commensurate with the scale of the study, six thermal zones have been recognized. The descriptions of the thermal zones, and their extents, are presented in Table 3.

5. TEMPERATURE SEASONALITY DURING GROWING PERIOD

In areas where growing periods extend into the Moderately Cool part of the year, with temperatures 15.0-20.0°C, two thermal zones separated in time are recognized.

Crop production may be possible with crop Groups II and III in the Moderately Warm (20.0-25.0°C) part of the year and with crop Groups I and IV in the Moderately Cool (15.0-20.0°C) part of the year. To enable these effects (arising from temperature seasonality) to be

Table 3 THERMAL ZONES OF MOZAMBIQUE

Code	Description of temperature[1] regime during the growing period	Extents km^2	%
W	Warm - Greater than 25.0°C	417 703	54.0
Wm	Moderately Warm - 20.0-25.0°C	301 239	38.9
Wm-Cm	Moderately Warm/Moderately Cool - 17.5-25.0°C	38 881	5.0
Cm-Wm	Moderately Cool/Moderately Warm - 15.0-22.5°C	11 581	1.5
Cm	Moderately Cool - 15.0-20.0°C	3 877	0.5
C	Cool - 10.0-15.0°C	261	< 0.1
	Total	773 542	100.0

[1] Mean daily temperature

taken into account in the crop suitability assessment, the relationship between the total length of growing period and the lengths corresponding to the Moderately Warm and Moderately Cool parts making up the total length were established. The relations for the temperature regimes Wm - Cm and Cm - Wm are presented in Table 4.

Table 4 LENGTHS (days) OF THE MODERATELY WARM (Wm) AND MODERATELY COOL (Cm) PARTS OF THE TOTAL GROWING PERIOD

Total Length	Wm-Cm		Cm-Wm	
	Wm-Length	Cm-Length	Wm-Length	Cm-Length
180-209	-	-	< 150	< 90
210-239	> 150	< 90	< 150	< 120
240-269	> 180	< 90	< 180	< 120
270-299	> 210	< 90	< 210	< 120
300-329	-	-	< 210	< 120

The ratio P/ET for the Cm-length indicates that a portion of such lengths is always intermediate.

6. AREA INVENTORY

The area inventory of thermal zones, pattern of growing period zones and length of growing period zones by district and province was undertaken on the 1:2 million climatic inventory map.

The mapped inventory was compiled by:

(i) plotting the individual station data of temperature, pattern and mean total dominant length of growing period

(ii) constructing boundaries of thermal zones, pattern of growing period zones and isolines of mean total dominant length of growing period with values of 60, 75, 90, 120, 160, 180, 210, 240, 270 and 300 days, delineating the mean total dominant length of growing period zones of 30-59, 60-74, 75-89, 90-119, 120-149 days etc.

The individual component lengths of both the dominant (mapped) and associated lengths of growing period zones for each pattern of growing period zone are presented in Appendix 1.

The original 1:2 million map on which area measurement of the various zones by district and province was undertaken accompanies this report (back pocket).

The information on extents of length of growing period zones by pattern and by thermal zones for each province of Mozambique is available, and the information at the country level is presented in this report.

The extents of length of growing period zones by pattern for all thermal zones combined are presented in Table 5, and for each thermal zone in Appendix 2.

The extents of length of growing period zones by thermal zone for all patterns combined are presented in Table 6, and for each pattern in Appendix 3.

The extents of thermal zones by pattern for all length of growing period zones combined are presented in Table 7, and for each growing period zone in Appendix 4.

Table 5 EXTENTS (km^2) OF LENGTH OF GROWING PERIOD ZONES BY PATTERN, FOR ALL THERMAL ZONES COMBINED

Pattern	Length[1] of growing period (days)											
	30-59	60-74	75-89	90-119	120-149	150-179	180-209	210-239	240-269	270-299	300-329	Total
1	-	764	1715	4700	9014	36118	59352	8897	1264	-	-	121824
1-2a	-	828	1127	18884	27994	105358	48174	4353	7740	11549	2017	228024
1-2b	-	418	3190	5336	7893	18395	25055	42427	20235	3646	-	126595
1-2-3	-	-	-	2482	32946	31385	26080	26602	13232	688	108	133523
2-1-3	27636	12404	14638	28786	22847	17935	8272	4480	4225	2040	-	143263
2-3-1	-	-	101	1870	3296	4491	3139	3546	2080	1790	-	20313
Total	27636	14414	20771	62058	103990	213682	170072	90305	48776	19713	2125	773542

[1] Mean total dominant length

Table 6 EXTENTS (km^2) OF LENGTH OF GROWING PERIOD ZONES BY THERMAL ZONE, FOR ALL PATTERNS COMBINED

Thermal Zone	Length[1] of growing period (days)											
	30-59	60-74	75-89	90-119	120-149	150-179	180-209	210-239	240-269	270-299	300-329	Total
W	-	2010	5228	23983	60301	134903	89730	65586	30423	5539	-	417703
Wm	27636	12404	15543	38075	43263	72602	58292	11652	12351	9411	10	301239
Wm-Cm	-	-	-	-	426	6075	19995	4899	3570	3819	97	38881
Cm-Wm	-	-	-	-	-	102	1748	6844	432	688	1767	11581
Cm	-	-	-	-	-	-	283	1201	1886	256	251	3877
C	-	-	-	-	-	-	24	123	114	-	-	261
Total	27636	14414	20771	62058	103990	213682	170072	90305	48776	19713	2125	773542

[1] Mean total dominant length

Table 7 EXTENTS (km^2) OF THERMAL ZONES BY PATTERN, FOR ALL LENGTH OF GROWING PERIOD ZONES COMBINED

Pattern	Thermal Zone						
	W	Wm	Wm-Cm	Cm-Wm	Cm	C	Total
1	59584	41728	11865	6991	1656	-	121824
1-2a	127272	86497	11806	2014	435	-	228024
1-2b	109834	8616	4356	1742	1786	261	126595
1-2-3	108447	18401	5841	834	-	-	133523
2-1-3	12566	125684	5013	-	-	-	143263
2-3-1	-	20313	-	-	-	-	20313
Total	417703	301239	38881	11581	3877	261	773542

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APPENDIX I

The individual component lengths of both the mean total dominant (mapped) and mean total associated (unmapped) lengths of growing period zones.

Pattern 1-2a (Proportion - 90%: 10%)

Dominant L1	1st Associated L2	1st Associated $L2_1$	1st Associated $L2_2$
60-89	60-89	30-59	0-29
90-119	90-119	60-89	30-59
120-149	120-149	90-119	30-59
150-179	150-179	90-119	30-59
180-209	180-209	120-149	30-59
210-239	210-239	150-179	30-59
240-269	240-269	180-209	30-59
270-299	270-299	210-239	30-59
300-329	300-329	240-269	30-59

Pattern 1-2b (75 : 25)

60-89	90-119	30-59	30-59
90-109	120-149	60-89	30-59
120-149	120-149	90-119	30-59
150-179	150-179	120-149	30-59
180-209	180-209	150-179	30-59
210-239	210-239	150-179	30-59
240-269	240-269	180-209	30-59
270-299	270-299	210-239	30-59
300-329	300-329	240-269	30-59

Pattern (60: 30: 10)

Dominant L1	1st Associated L2	1st Associated $L2_1$	1st Associated $L2_2$	2nd Associated L3	2nd Associated $L3_1$	2nd Associated $L3_2$	2nd Associated $L3_3$
90-119	90-119	60-89	30-59	90-119	60-89	30-59	0-29
120-149	120-149	90-119	30-59	120-149	60-89	30-59	0-29
150-179	150-179	90-119	30-59	150-179	90-119	30-59	0-29
180-209	180-209	120-149	30-59	180-209	90-119	30-59	0-29
210-239	210-239	150-179	60-89	180-209	90-110	30-59	30-59
240-269	240-269	150-179	60-89	210-239	120-149	30-59	30-59
270-299	270-299	180-209	60-89	240-269	120-149	60-89	30-59
300-329	270-299	210-239	60-89	270-299	150-179	60-89	30-59

Pattern 2-1-3 (45: 30: 25)

Dominant L2	Dominant $L2_1$	Dominant $L2_2$	1st Associated L1	2nd Associated L3	2nd Associated $L3_1$	2nd Associated $L3_2$	2nd Associated $L3_3$
30-59	30-59	0-29	60-89	60-89	30-59	0-29	0-29
60-89	30-59	30-59	60-89	90-119	30-59	30-59	0-29
90-119	60-89	30-59	90-119	120-150	60-89	30-59	0-29
120-149	60-89	30-59	120-149	150-179	60-89	30-59	0-29
150-179	90-119	30-59	150-179	150-179	60-89	30-59	30-59
180-209	120-149	60-89	180-209	180-209	90-119	60-89	30-59
210-239	150-179	60-89	210-239	210-239	90-119	60-89	30-59
240-269	180-209	60-89	240-269	240-269	90-119	60-89	30-59
270-299	180-209	60-89	270-299	240-269	120-149	60-89	30-59
300-329	210-239	60-89	300-329	270-299	120-149	90-119	30-59

Pattern 2-3-1 (55: 30: 15)

Dominant L2	Dominant $L2_1$	Dominant $L2_2$	1st Associated L3	1st Associated $L3_1$	1st Associated $L3_2$	1st Associated $L3_3$	2nd Associated L1
60-89	60-89	0-29	90-119	30-59	30-59	0-29	60-89
90-119	60-89	0-29	120-149	60-89	30-59	0-29	90-119
120-149	90-119	30-59	150-179	60-89	30-59	30-59	120-149
150-179	90-119	30-59	150-179	60-89	30-59	30-59	150-179
180-209	120-149	60-89	180-209	60-89	30-59	30-59	180-209
210-239	120-149	60-89	210-239	90-119	60-89	30-59	210-239
240-269	150-179	90-119	210-239	90-119	60-89	30-59	270-299
270-299	150-179	90-119	240-269	90-119	60-89	30-59	300-329
300-329	180-209	120-149	240-269	120-149	60-89	60-89	330-364

Notes:

L1 - Total length consisting of one growing period per year

L2 - Total length consisting of two growing periods per year

$L2_1$ - First length of the two growing periods

$L2_2$ - Second length of the two growing periods

L3 - Total length consisting of three growing periods per year

$L3_1$ - First length of the three growing periods

$L3_2$ - Second length of the three growing periods

$L3_3$ - Third length of the three growing periods

APPENDIX 2

Extents (km^2) of mean total dominant length of growing period zones by pattern for each thermal zone.

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Thermal Zone : 01 WARM (W)

LGP (days)

Pattern	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
1		764	911	1525	4218	25732	26434					59584
1-2a		828	1127	17122	19041	65210	18109	435	1686	3714		127272
1-2b		418	3190	5336	7855	16218	20781	39253	14958	1825		109834
1-2-3					25032	26595	19640	24805	12375			108447
2-1-3					4155	1148	4766	1093	1404			12566
2-3-1												
THERMAL TOT		2010	5228	23983	60301	134903	89730	65586	30423	5539		417703

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS C6.1b)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Thermal Zone : 02 MODERATELY WARM (Wm)

LGP (days)

Pattern	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
1			804	3175	4518	7455	24909	624	243			41728
1-2a				1762	8818	37466	23764	3552	5523	5602	10	86497
1-2b					25	2014	1062	263	3694	1558		8616
1-2-3				2482	7914	4389	2234	1382				18401
2-1-3	27636	12404	14638	28786	18692	16787	3184	2285	811	461		125684
2-3-1			101	1870	3296	4491	3139	3546	2080	1790		20313
THERMAL TOT	27636	12404	15543	38075	43263	72602	58292	11652	12351	9411	10	301239

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS C6.10)

Summary Tables at Country level

Country :144 MOZAMBIQUE

Thermal Zone : 03 MODERATELY WARM/MODERATELY COOL (Wm-Cm)

LGP (days)

Pattern	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
1					278	2931	6525	2054	77			11865
1-2a					135	2618	6048	352	507	2049	97	11806
1-2b					13	163	2894	976	119	191		4356
1-2-3						363	4206	415	857			5841
2-1-3							322	1102	2010	1579		5013
2-3-1												
THERMAL TOT					426	6075	19995	4899	3570	3819	97	38881

AGRO-ECOLOGICAL ZONE - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents (ha)) (AEZ-CS CS.15)

Summary Tables at Country level

Country :144 MOZAMBIQUE

Thermal Zone : 04 MODERATELY COOL/MODERATELY WARM (Cm-Wm)

LGP (days)

Pattern	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
1							1353	5576	62			6991
1-2a						64	253	14	24		1659	2014
1-2b							142	1254	346			1742
1-2-3						38				688	108	834
2-1-3												
2-3-1												
THERMAL TOT						102	1748	6844	432	688	1767	11581

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km.) (AEZ-CS C6.10)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Thermal Zone : 05 MODERATELY COOL (Cm)

LGP (days)

Pattern	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
1							131	643	882			1656
1-2a										184	251	435
1-2b							152	558	1004	72		1786
1-2-3												
2-1-3												
2-3-1												
THERMAL TOT							283	1201	1886	256	251	3877

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents km.) (AEZ-CS C6.10)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Thermal Zone : 06 COOL (C)

Pattern	LGP (days) 30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
1												
1-2a												
1-2b												
1-2-3							24	123	114			261
2-1-3												
2-3-1												
THERMAL TOT							24	123	114			261
GRAND TOTALS	27636	14414	20771	62058	103990	213682	170072	90305	48776	19713	2125	773542

APPENDIX 3

Extents (km^2) of mean total dominant length of growing period zones by thermal zone for each pattern.

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS C6.11)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Pattern : 01 1

LGP (days)

Thermal Zone	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
01		764	911	1525	4218	25732	26434					59584
02			804	3175	4518	7455	24909	624	243			41728
03					278	2931	6525	2054	77			11865
04							1353	5576	62			6991
05							131	643	882			1656
06												
PATTERN TOT		764	1715	4700	9014	36118	59352	8897	1264			121824

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Ha2) (AEZ-CS Co.11)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Pattern : 02 1-2a

LGP (days)

Thermal Zone	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
01		828	1127	17122	19041	65210	18109	435	1686	3714		127272
02				1762	8818	37466	23764	3552	5523	5602	10	86497
03					135	2618	6048	352	507	2049	97	11806
04						64	253	14	24		1659	2014
05										184	251	435
06												
PATTERN TOT		828	1127	18884	27994	105358	48174	4353	7740	11549	2017	228024

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) [illegible]

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Pattern : 03 1-2b

LGP (days)

Thermal Zone	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
01		418	3190	5336	7855	16218	20781	39253	14958	1825		109834
02					25	2014	1062	263	3694	1558		8616
03					13	163	2894	976	119	191		4356
04							142	1254	346			1742
05							152	558	1004	72		1786
06							24	123	114			261
PATTERN TOT		418	3190	5336	7893	18395	25055	42427	20235	3646		126595

AGRO-ECOLOGICAL ZONE [illegible]

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Pattern : 04 1-2-3

Thermal Zone	LGP (days) 30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
01					25032	26595	19640	24805	12375			108447
02				2482	7914	4389	2234	1382				18401
03						363	4206	415	857			5841
04						38				688	108	834
05												
06												
PATTERN TOT				2482	32946	31385	26080	26602	13232	688	108	133523

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Pattern : 05 2-1-3

LGP (days)

Thermal Zone	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
01					4155	1148	4766	1093	1404			12566
02	27636	12404	14638	28786	18692	16787	3184	2285	811	461		125684
03							322	1102	2010	1579		5013
04												
05												
06												
PATTERN TOT	27636	12404	14638	28786	22847	17935	8272	4480	4225	2040		143263

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS Co. 1)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

Pattern : 06 2-3-1

LGP (days)

Thermal Zone	30 59	60 74	75 89	90 119	120 149	150 179	180 209	210 239	240 269	270 299	300 329	Total
01												
02			101	1870	3296	4491	3139	3546	2080	1790		20313
03												
04												
05												
06												
PATTERN TOT			101	1870	3296	4491	3139	3546	2080	1790		20313
GRAND TOTALS	27636	14414	20771	62058	103990	213682	170072	90305	48776	19713	2125	773542

APPENDIX 4

Extents (km^2) of thermal zones by pattern for each length of growing period zone.

Summary Tables at Country level

Country :144 MOZAMBIQUE

LGP : 030 - 059

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1							
1-2a							
1-2b							
1-2-3							
2-1-3		27636					27636
2-3-1							
LGP TOTALS		27636					27636

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) [illegible]

Summary Tables at Country level

Country :144 MOZAMBIQUE

LGP : 060 - 074

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1	764						764
1-2a	828						828
1-2b	418						418
1-2-3							
2-1-3		12404					12404
2-3-1							
LGP TOTALS	2010	12404					14414

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 075 - 089

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1	911	804					1715
1-2a	1127						1127
1-2b	3190						3190
1-2-3							
2-1-3		14638					14638
2-3-1		101					101
LGP TOTALS	5228	15543					20771

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents AEZ, [illegible])

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 090 - 119

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1	1525	3175					4700
1-2a	17122	1762					18884
1-2b	5336						5336
1-2-3		2482					2482
2-1-3		28786					28786
2-3-1		1870					1870
LGP TOTALS	23983	38075					62058

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 120 - 149

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1	4218	4518	278				9014
1-2a	19041	8818	135				27994
1-2b	7855	25	13				7893
1-2-3	25032	7914					32946
2-1-3	4155	18692					22847
2-3-1		3296					3296
LGP TOTALS	60301	43263	426				103990

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents KM2)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 150 - 179

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1	25732	7455	2931				36118
1-2a	65210	37466	2618	64			105358
1-2b	16218	2014	163				18395
1-2-3	26595	4389	363	38			31385
2-1-3	1148	16787					17935
2-3-1		4491					4491
LGP TOTALS	134903	72602	6075	102			213682

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) [illegible]

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 180 - 209

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1	26434	24909	6525	1353	131		59352
1-2a	18109	23764	6048	253			48174
1-2b	20781	1062	2894	142	152	24	25055
1-2-3	19640	2234	4206				26080
2-1-3	4766	3184	322				8272
2-3-1		3139					3139
LGP TOTALS	89730	58292	19995	1748	283	24	170072

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS C6.12)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 210 - 239

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1		624	2054	5576	643		8897
1-2a	435	3552	352	14			4353
1-2b	39253	263	976	1254	558	123	42427
1-2-3	24805	1382	415				26602
2-1-3	1093	2285	1102				4480
2-3-1		3546					3546
LGP TOTALS	65586	11652	4899	6844	1201	123	90305

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS C6.12)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 240 - 269

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1		243	77	62	882		1264
1-2a	1686	5523	507	24			7740
1-2b	14958	3694	119	346	1004	114	20235
1-2-3	12375		857				13232
2-1-3	1404	811	2010				4225
2-3-1		2080					2080
LGP TOTALS	30423	12351	3570	432	1886	114	48776

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS C6.12)

Summary Tables at Country level

Country : 144 MOZAMBIQUE

LGP : 270 - 299

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1							
1-2a	3714	5602	2049		184		11549
1-2b	1825	1558	191		72		3646
1-2-3				688			688
2-1-3		461	1579				2040
2-3-1		1790					1790
LGP TOTALS	5539	9411	3819	688	256		19713

AGRO-ECOLOGICAL ZONES - COMPUTER SYSTEM (AEZ-CS) LAND INVENTORY (Extents Km2) (AEZ-CS C6.12)

Summary Tables at Country level

Country :144 MOZAMBIQUE

LGP : 300 - 329

Thermal Zones

Pattern	1	2	3	4	5	6	Total
1							
1-2a		10	97	1659	251		2017
1-2b							
1-2-3				108			108
2-1-3							
2-3-1							
LGP TOTALS		10	97	1767	251		2125
GRAND TOTALS	417703	301239	38881	11581	3877	261	773542