

AG/ETH/82/010
TECHNICAL REPORT 1

MASTER LAND USE PLAN
ETHIOPIA
ANNEX 2
REGIONAL PROFILES OF LAND RESOURCES

Report prepared for
the Government of the Peoples
Democratic Republic of Ethiopia

based on the work
of
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in collaboration with
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UNITED NATIONS DEVELOPMENT PROGRAMME
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome 1988

This technical report is one of series of reports prepared during the course of the projects identified on the title page. The conclusions and recommendations given in the report are those considered appropriate at the time of its preparation. They may be modified in the light of further knowledge gained at subsequent stages of the project.

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AKNOWLEDGEMENTS

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TABLE OF CONVERSION FACTORS

2.07 ETHIOPIAN BIRR = 1.00 US DOLLAR

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1. INTRODUCTION

1.1 Background

The terms of reference of the Master Land Use Plan request that the large quantity of land resource data produced during the various phases of the FAO/UNDP Assistance to Land Use Planning Project, be represented in manner suitable for the use of senior planners and higher level officials in Government. Previously, the land resources data base required considerable technical experience on the part of those who wished to use it. While this was quite valid in the original context of a technical project, a growing need has arisen since the data was first generated for a limited technical appreciation of the nature and distribution of land resources in Ethiopia among a much more diverse and less technical audience of planners and officials. The information in this annex is therefore presented in a graphic form, on a Region and Awraja basis, to help achieve these objectives.

1.2 Structure of this report

The report is divided into several sections, each of which contains a summary by Region and Awraja of a particular land resource theme. The details concerning land resources are presented in the form of bar graphs to make a general appraisal of the character of each Awraja possible with a minimum of effort. The first section of the annex provides details on the percentage of the traditional altitude zones which go to make up the Regions and Awrajas. The second section gives details of the dependable growing period, a concept explained in more detail later in the report. This is followed by information on the distribution of land management classes in each Awraja. Finally, the estimated soil loss rates in each Awraja are shown in four classes, from none to slight to very high.

2. TRADITIONAL ALTITUDE ZONES

2.1 General

Information on traditional altitude zones is an important means of gaining a first impression of the environmental character of any locality in Ethiopia, because altitude is strongly related to temperature and, to a lesser extent, moisture availability.

Five main zones are summarized for each Region and Awraja in the following charts. For clarity of understanding, no attempt was made to subdivide the traditional zones in more detail. The zones, the corresponding altitude ranges, and the codes used to describe them in the bar charts are as follows:

<u>Zone</u>	<u>Altitude Range</u> (meters)	<u>Code</u>
Upper Wurch	> 3500	UW
Wurch	2900 - 3500	W
Dega	2300 - 2900	D
Weina Dega	1800 - 2300	WD
Kolla	< 1800	K

2.2 How to use the bar charts

Between 1 and 5 bars may represent the traditional altitude zones in each Awraja, depending on the number of zones which occur in the Awraja. The bars are hatched according to the legend at the bottom of the chart and correspond to the letters in the table above, ie UW, W, D, WD, and K. The hatching styles are consistent in all charts. The percentage of the traditional altitude zones in each Awraja is represented by the relative length of the different bars and can be determined from the values indicated on the y-axis of the charts.

2. DEPENDABLE GROWING PERIOD

2.1 General

The following information describes the dependable moisture conditions for rainfed crop production in each Region and Awraja in the Ethiopia. Growing period is, a technical term used to describe the period in a year when soil moisture conditions are satisfactory for rainfed crop production without moisture stress. The manner in which a growing period is estimated is described in Technical Report 5, Agroecological Zones Study.

Dependable growing period (DGP) is a term used to describe the statistical reliability of a growing period. Growing periods (GFs) can be estimated for individual seasons, years, averaged over many years or, as is done for the following presentation, calculated to represent a probability of occurrence 8 years in 10. A GP is usually estimated in days from beginning to end. The length of this period is crucial to the satisfactory development and maturation of crops. Some crops require a long GP of more than 200 hundred uninterrupted growing days, others as little as 60 days. If the expected length of the GP is known with some certainty, agricultural planning can be substantially improved. In highly variable rainfall environments, such as occur in many parts of the north and east of Ethiopia, knowledge of the average situation is not very useful for year to year planning of agriculture. If it is clear that 8 years in every 10 the GP will begin in early July and last until the end of September, then only crops which will prosper under such a short GP can be planted with a high probability of successfully reaching maturity. On the other hand, the average GP may appear to start in June and continue until October. Relying on averages could therefore lead to crop failures of longer season varieties chosen on this basis.

It is with this background that the information on DGP were compiled for the MLUP. The main growing season in each Awraja (the Meher season) is plotted on bar charts which indicate the length of the DGP in days and the percentage of the Awraja which has such a GP. Since many Awrajas occur in areas with more than one rainy season, it is possible for more than one GP to occur in a year. Just because it rains, however, is not sufficient cause to assume a GP will occur. The balance between rainfall, evaporation, runoff and the storage capacity of the soils concerned must reach certain thresholds before a GP can begin. In areas with a substantial two season or bimodal rainfall pattern, the DGPs resulting from rains early in the year (Belg season) are also plotted on the bar charts, but using a different symbol. There are 5 classes of DGP as follows:

< 60 days - here cropping is usually not practised
as the GP is too unreliable,

60-90 days - cropping practised but success limited to 5 years in every 10 on average, Fast maturing, drought resistant crops required.

91-120 days - cropping practised and successful 8 years in 10. Short season crops and varieties required.

121-150 days - cropping reasonably secure in all but the worst drought years.

150-210 days - cropping secure.

> 210 days - cropping secure for annuals, perennial crops begin to appear as suitable above this threshold.

Maps of GF are given in Annex 4 of Technical Report 1.

3. LAND MANAGEMENT CLASSES

3.1 General

Land resource data generated during the FAO/UNDP Assistance to Land Use Planning Project has been condensed in the following pages to provide a general assessment of the extent of 5 important land management classes in each Region and Awraja of Ethiopia. Data are again presented in the form of bar charts to make comprehension easier.

3.2 Interpretation of the charts

The 5 classes are defined as follows:

Arable land

- DGP > 90 days
- soil depth > 25 cm
- surface stoniness < 50-90% stone cover
- Vertisols not included
- slopes > 30% not included

Vertisols

- all areas predominantly covered by heavy black clays, which are > 50 cm in depth, which shrink and swell between wet season and dry season, which are seasonally inundated and which have high draught requirements for cultivation..

Steep land

- all land over 30% slope

Marginal land

- DGP < 90 days, Median Growing period (MGF) > 60 days
- all other factors except DGP the same as for arable land

Non-arable land

- < 60 days MGF
- soil depth < 25 cm
- surface stoniness > 50-90%

interpretation of the charts is straightforward, given the nature of the land in each class as described above. The percent of each Awraja occupied by the different classes is indicated by the height of the bar chart and can be estimated on the y-axis if required. As indicated previously, the objective of these charts is to provide higher level planners with a general overview of the land resources in each Administrative Region and Awraja.

The definition of arable land used in preparing these charts is somewhat generous, since soils down to 25 cm depth are not usually considered arable. In Ethiopia, however, they are used for cultivation of many local crops and varieties and yields remain sufficient to provide subsistence for families where land is scarce. A DGP of > 90 days was chosen as a cutoff point in the definition of arable land because, below this threshold, production of crops for subsistence cannot be considered secure with currently available crops and varieties in Ethiopia. Vertisols were separated from arable land because they have special management problems - drainage protection and high draught requirements being the two most serious. Steep land was also separated from arable land although this is also used extensively in areas where population pressure is high. Cultivation of slopes over 30% requires very special management to ensure that they are not eroded rapidly. Marginal land was separated to highlight the zone of Ethiopia in which production is currently insecure. At present, the marginal zone offers possibilities for successful crop production in approximately 5 years in 10. Appropriate short season crops and varieties offer substantial potential for more secure food production in these areas. The last category shown in the charts is non-arable land. In general, a short and highly variable growing season is the most limiting factor in these areas. Potential exists for livestock development and incense production in most localities classified as non-arable.

4. ESTIMATED SOIL LOSS RATE

4.1 General

The bar charts in this section are derived from the Soil Loss Rate map (FAO 1983), produced in the LUPRD as a component of the FAO/UNDP Assistance to Land Use Planning Project. The soil loss rate categories indicated on the original map have been clustered for a more convenient presentation in this document. The proportion of each Awraja falling into each of four soil loss rate categories is indicated by the percentage figures along the y-axis of the charts.

The original data on estimated soil loss rate were derived from consideration of rainfall erosivity, slope, soil characteristics, vegetation cover and land use. Data are for water erosion losses only. Because of the many approximations involved in the original study, the relative values presented should be considered as indicative of relative rather than absolute losses within and between Awrajas.

The four classes are defined as follows:

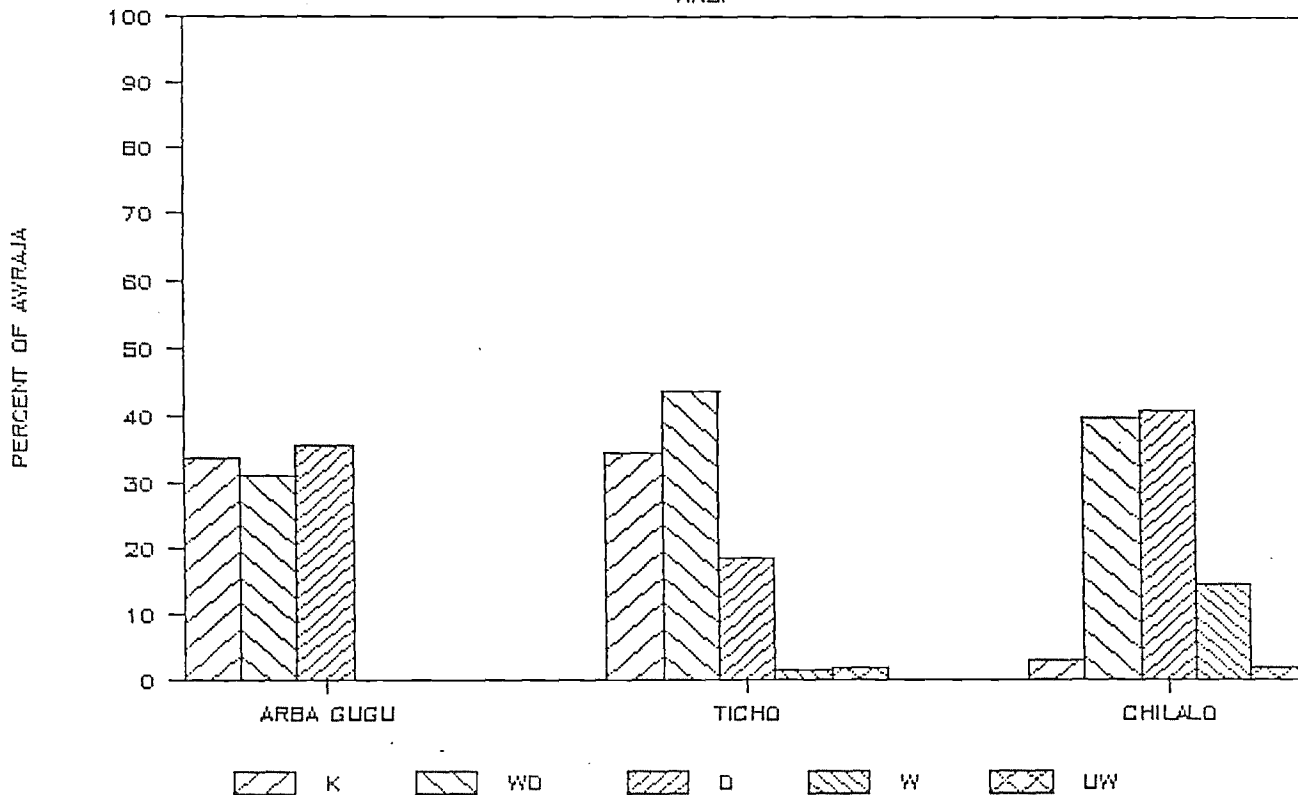
<u>Class</u>	<u>Symbol</u>	<u>mm/annum</u>	<u>tonnes/ha/annum</u>
none to slight	N-SL	0 - 1	0 - 15
moderate	MOD	1 - 4	16 - 50
high	HIGH	4 - 16.5	51 - 200
very high	V.HIGH	16.5 - 25	200 - 300+

For further information on the methods used in the derivation of the soil loss rates shown in the charts, reference should be made to Field Document 5, FAO/UNDP Assistance to Land Use Planning, ETH/82/010, 1984.

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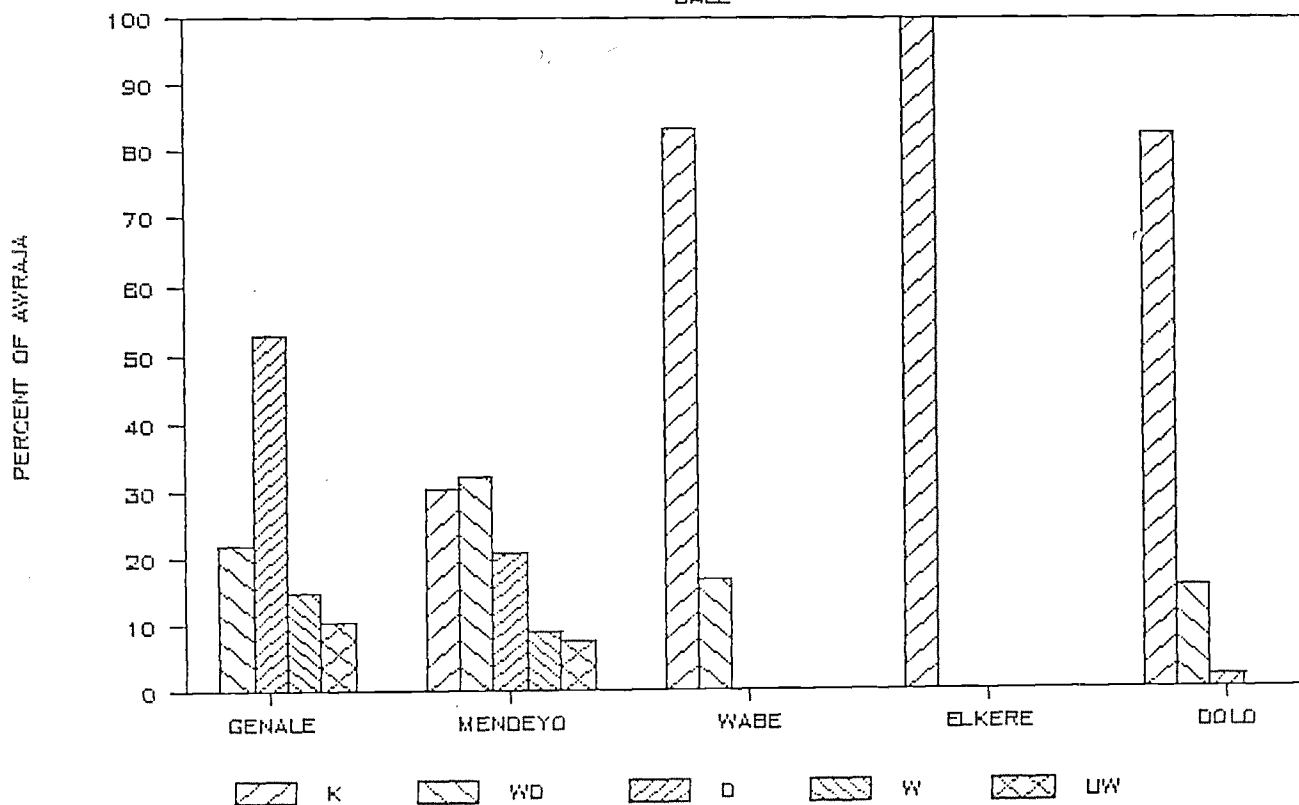
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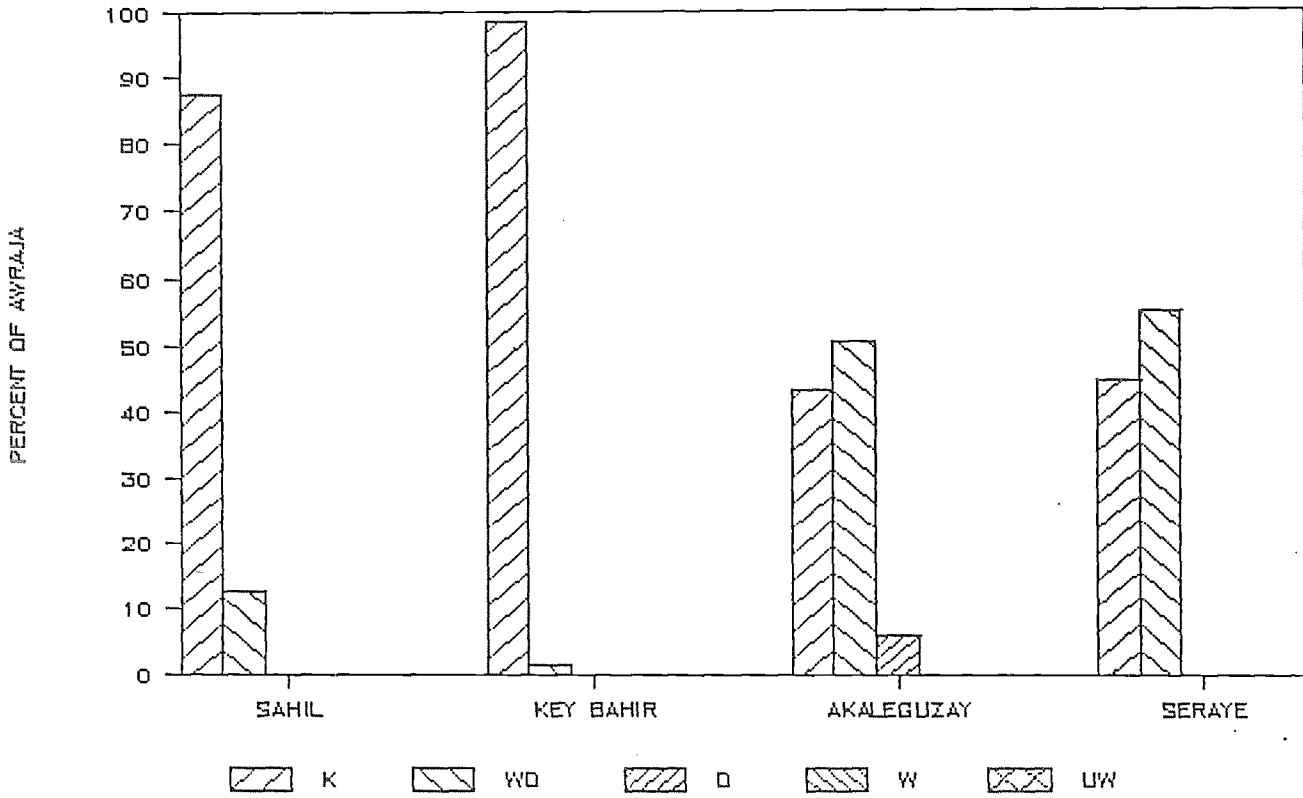
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BALE



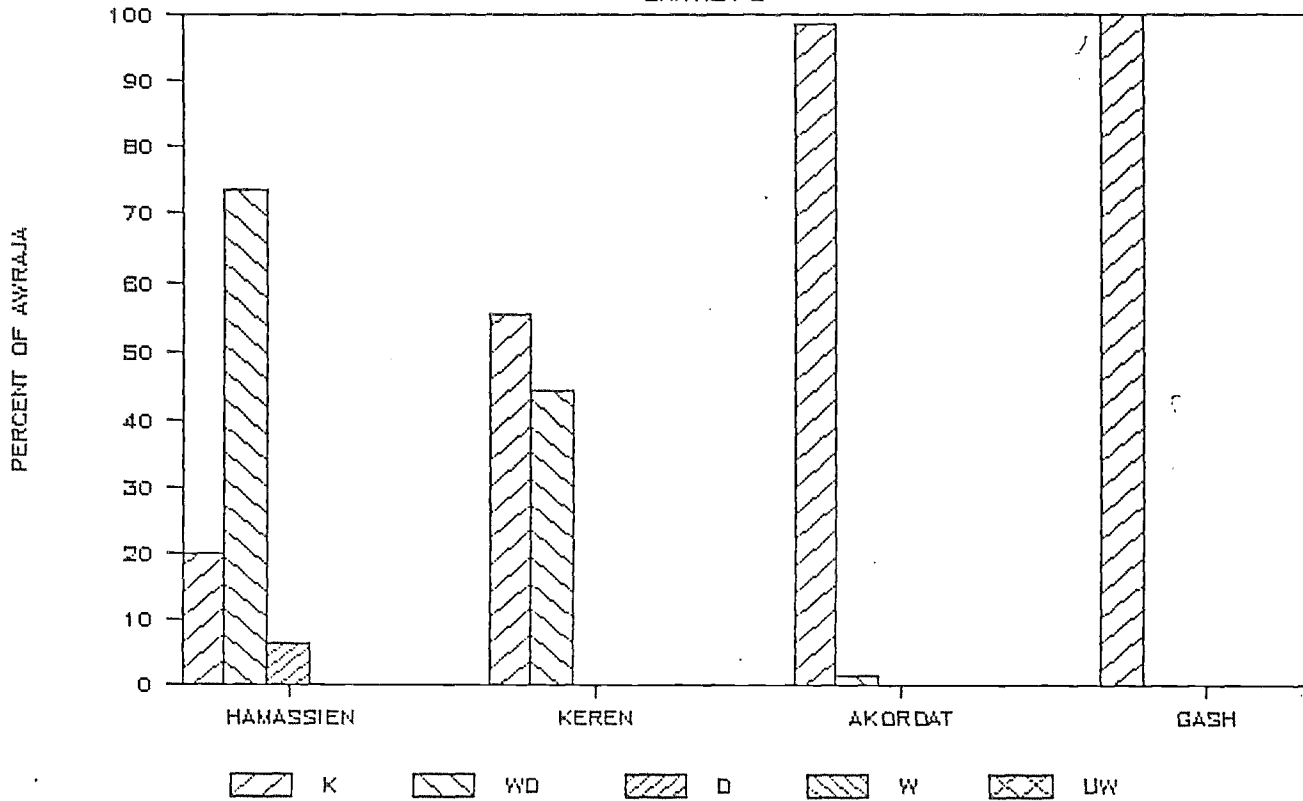
TRADITIONAL ALTITUDE ZONATION

ERITREA 1



TRADITIONAL ALTITUDE ZONATION

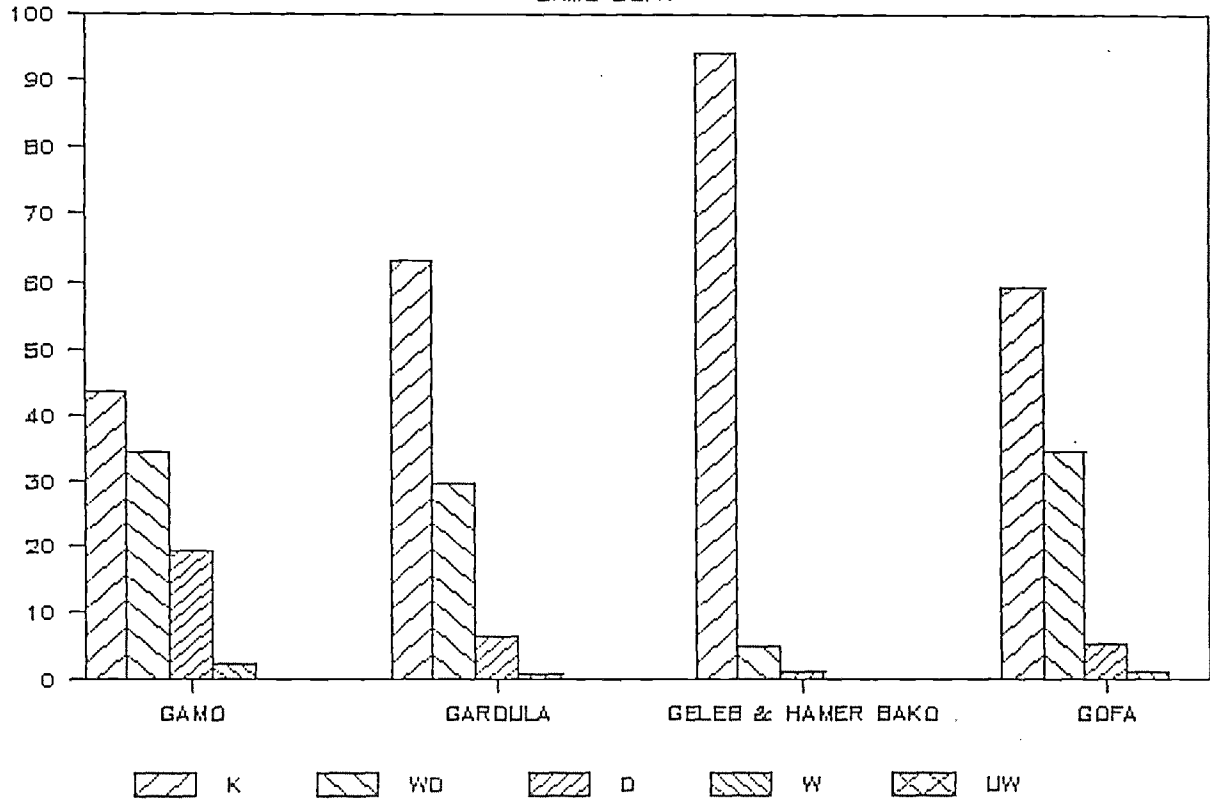
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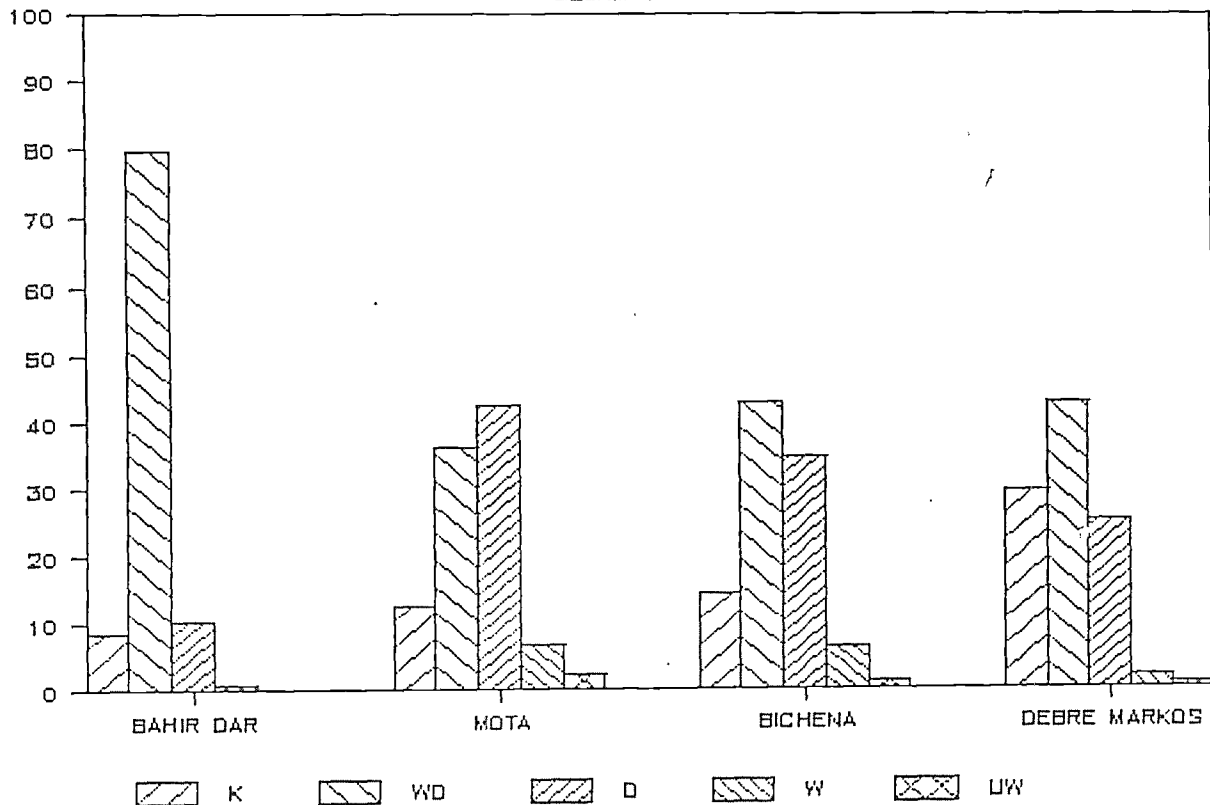
GAMO GOFA

PERSENTASE DI ANJARAN



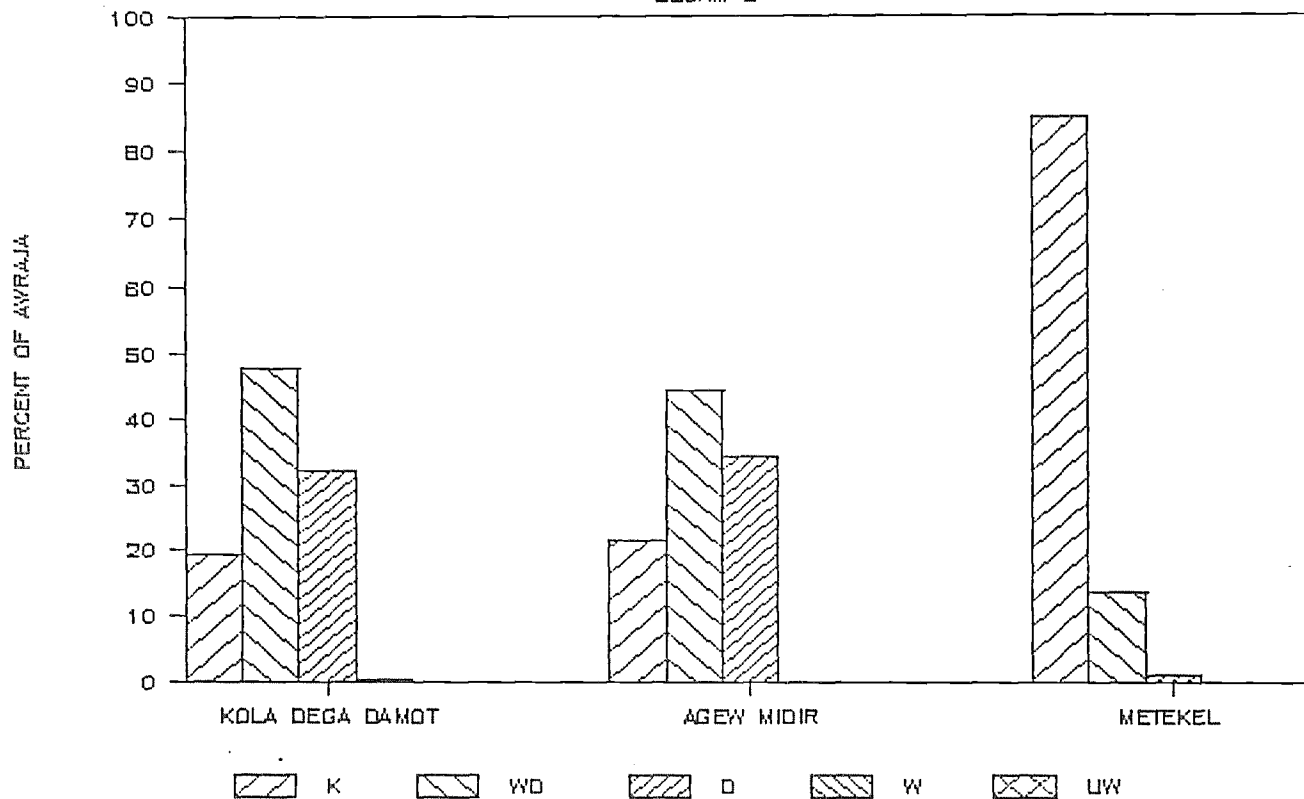
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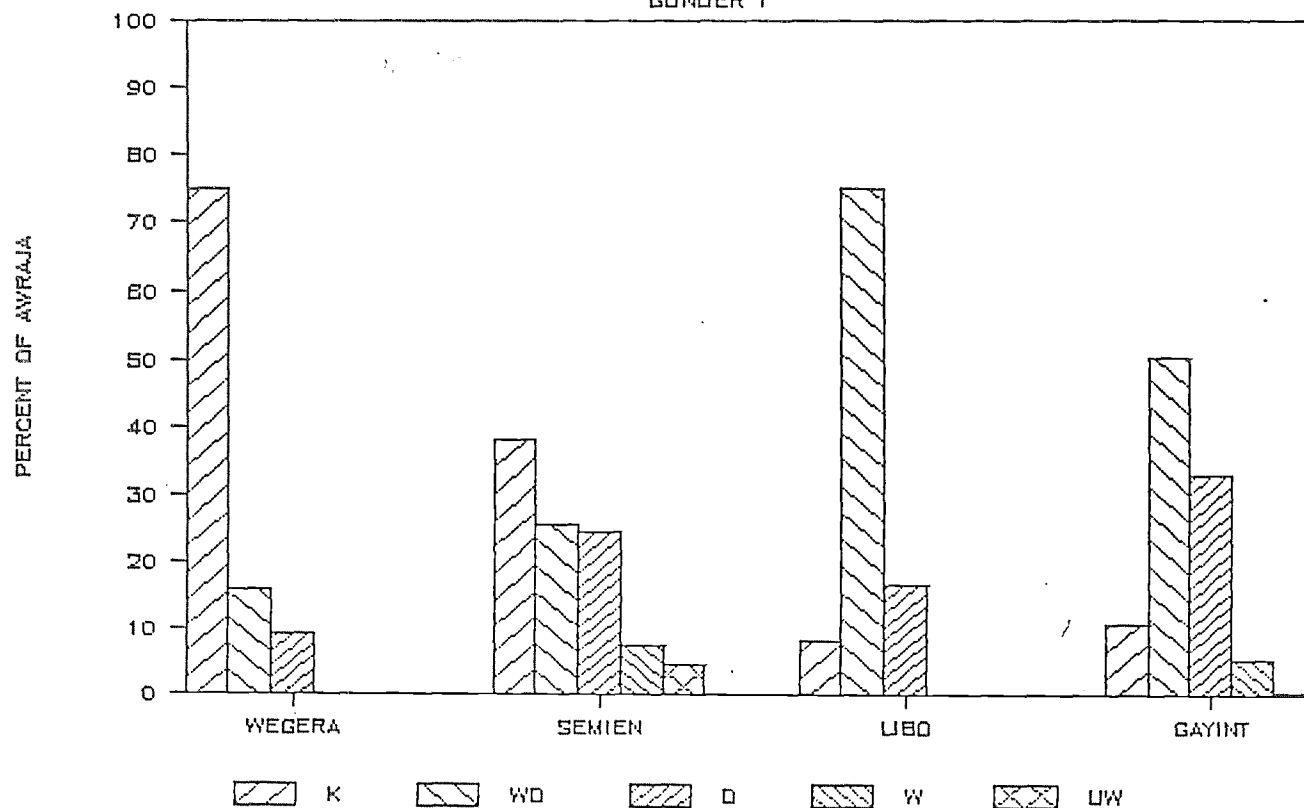
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GOJAM 2



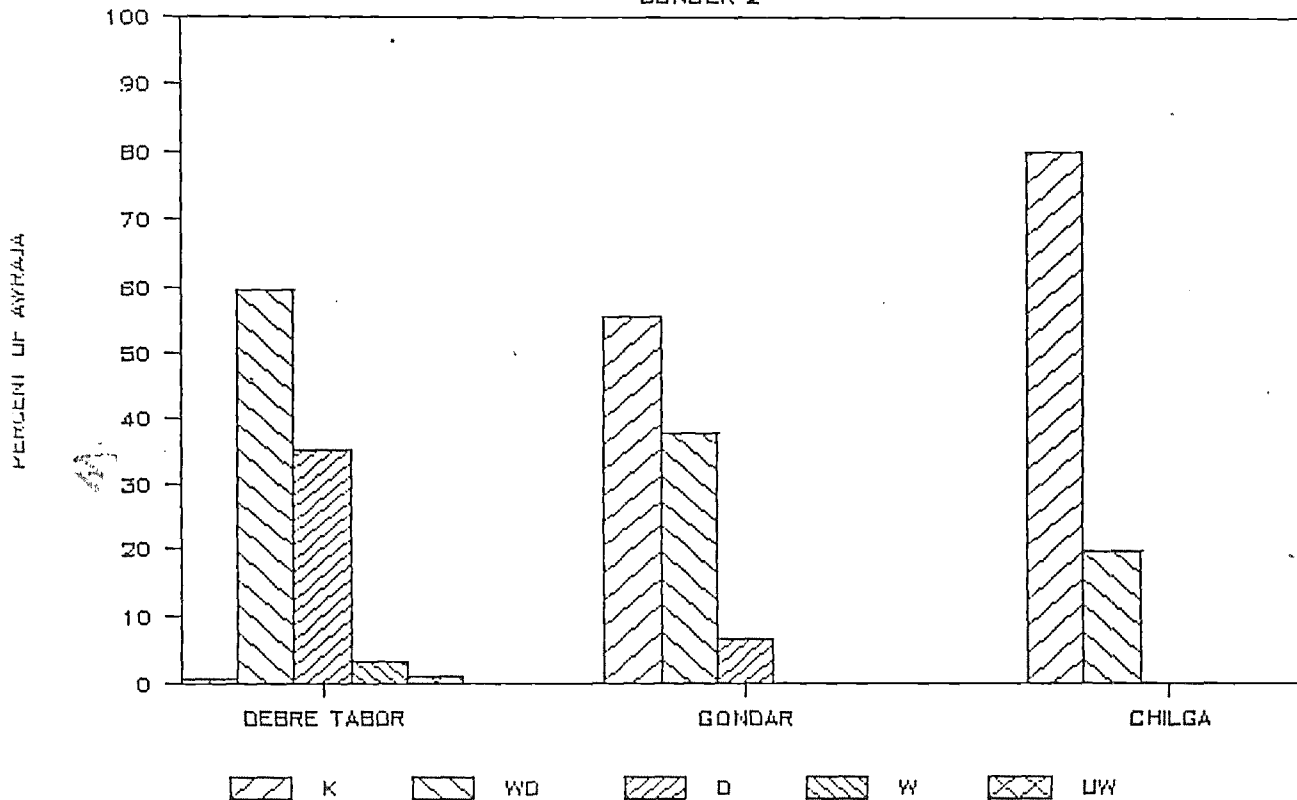
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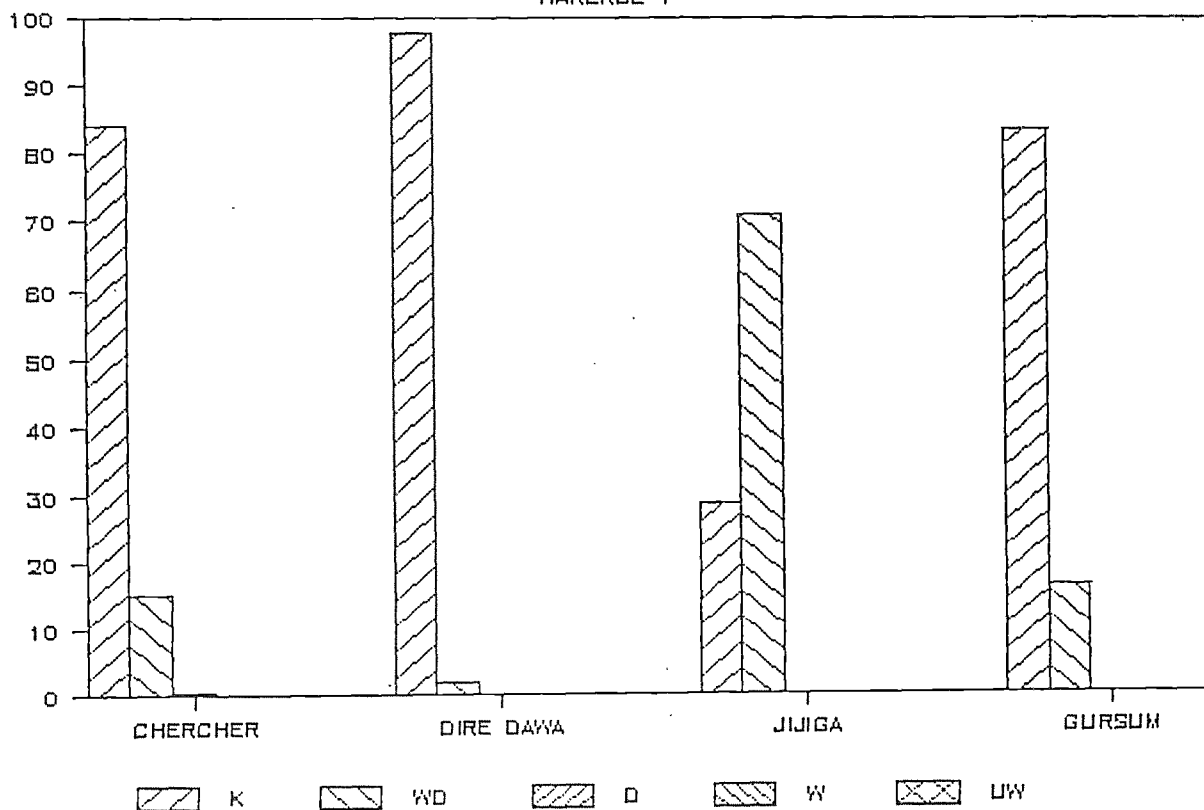
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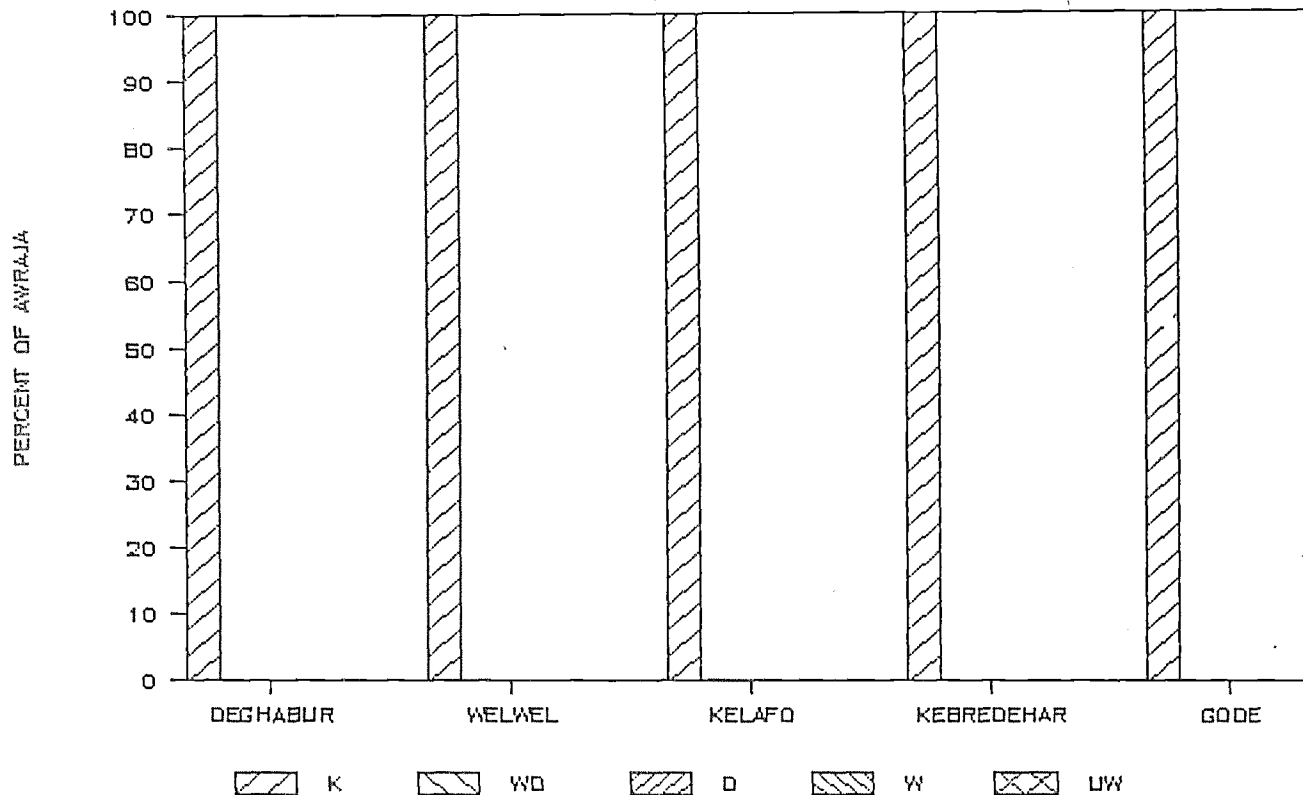
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HARERGE 1



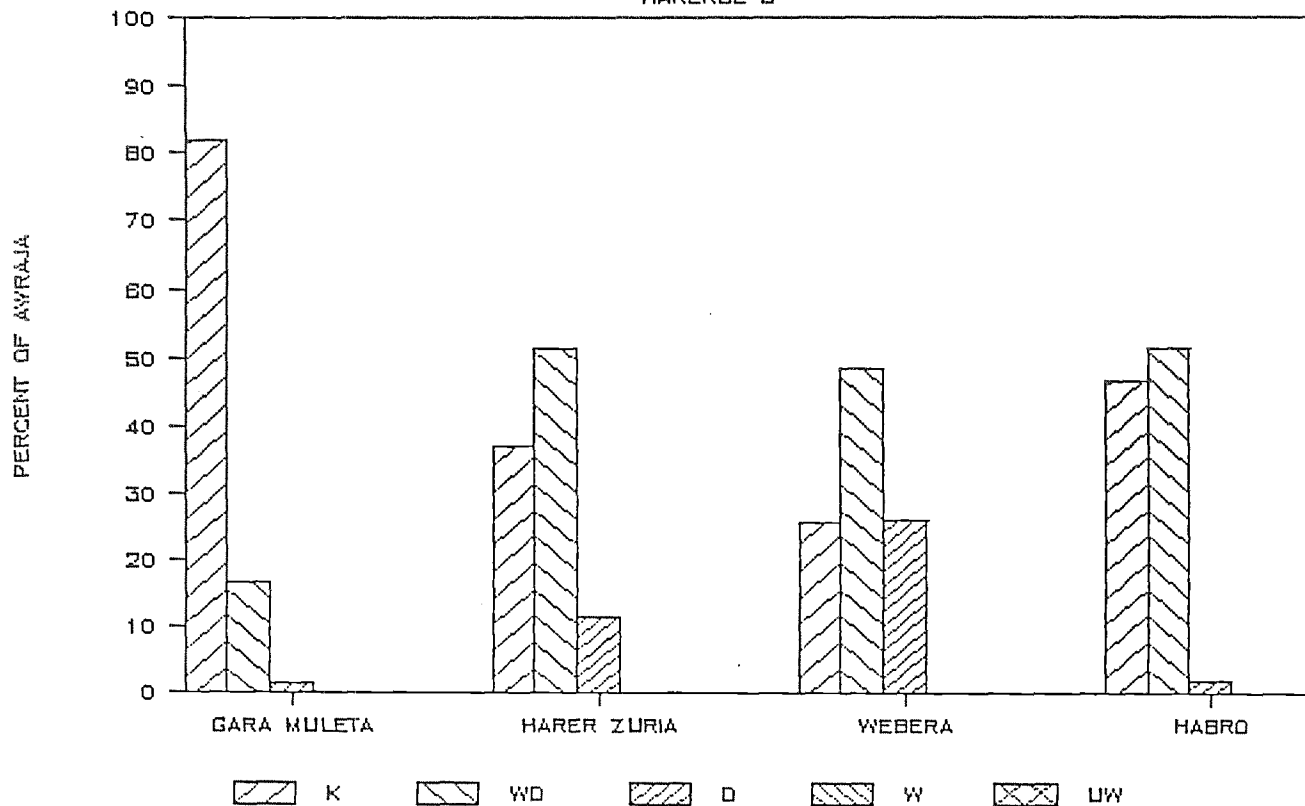
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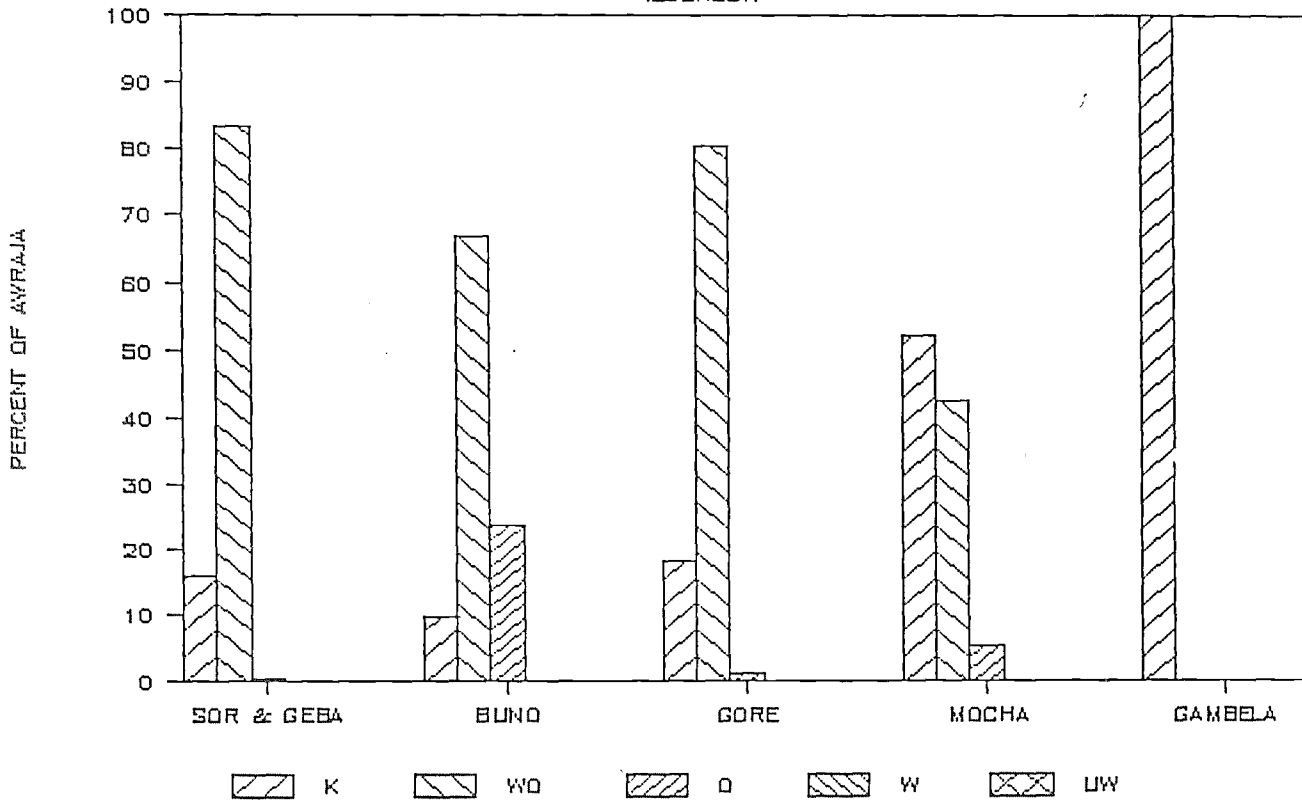
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HARERGE 3



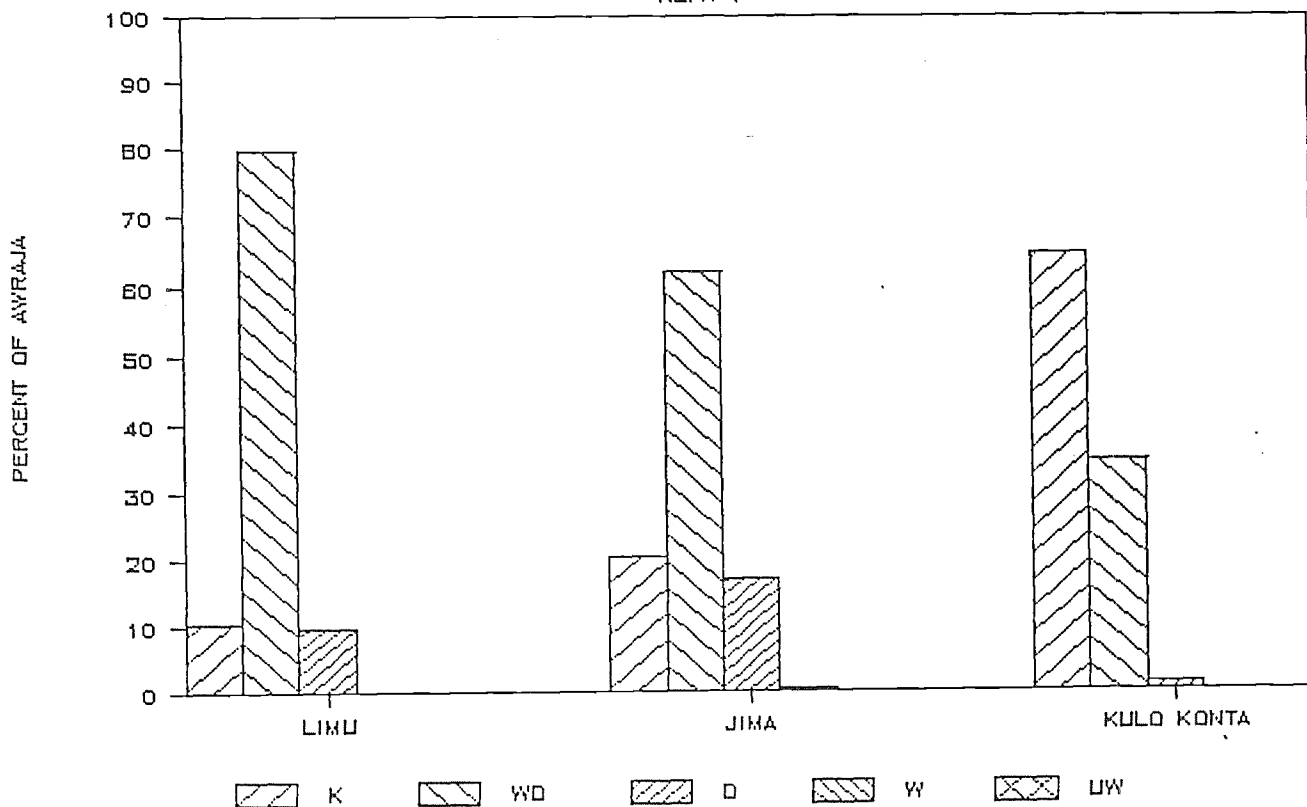
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ILJABABOR



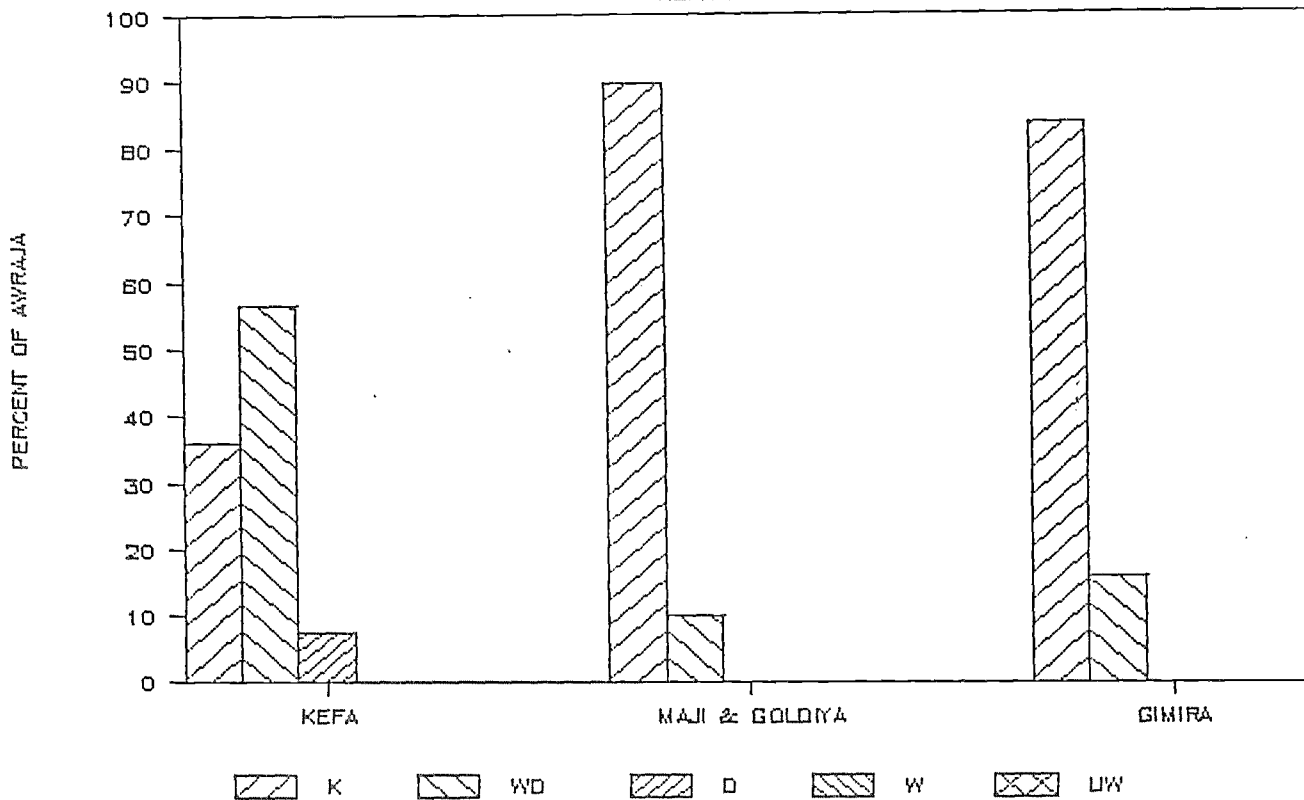
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KEFA 1



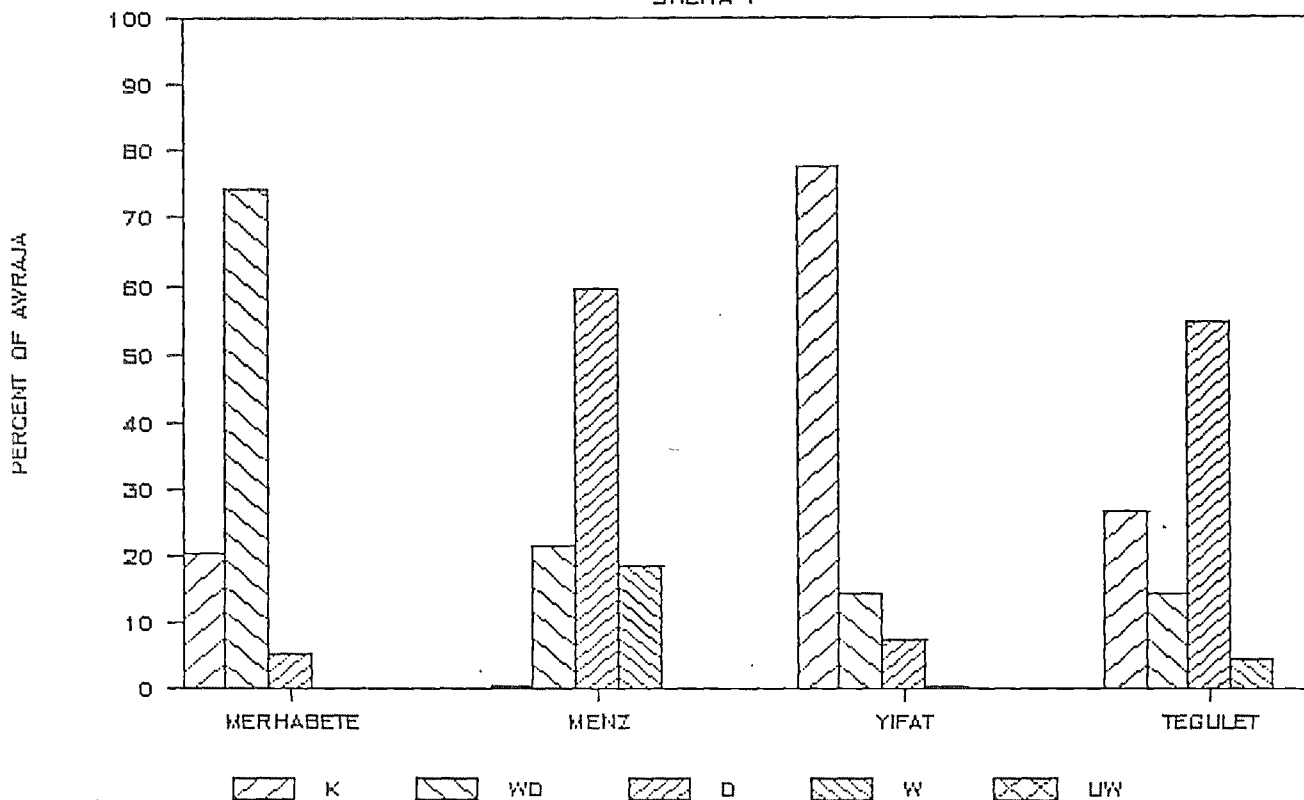
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KEFA 2



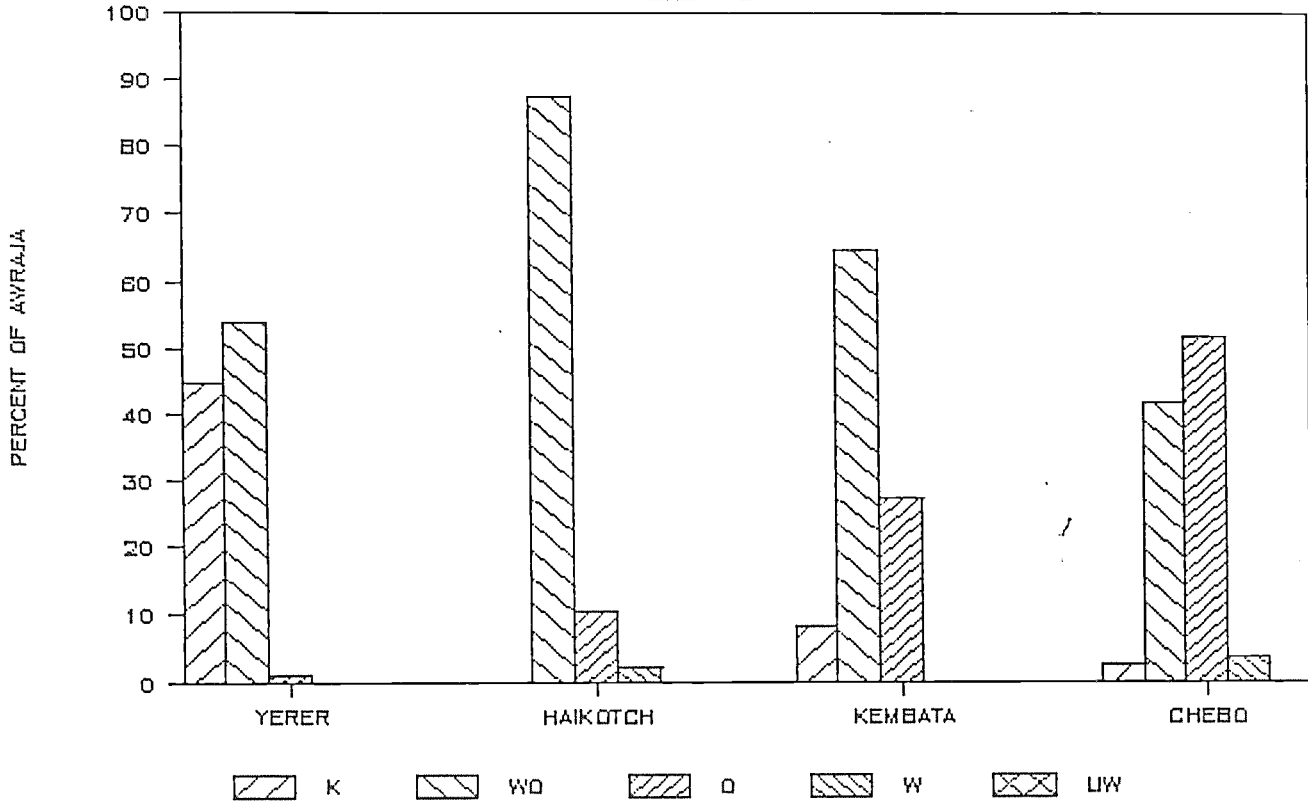
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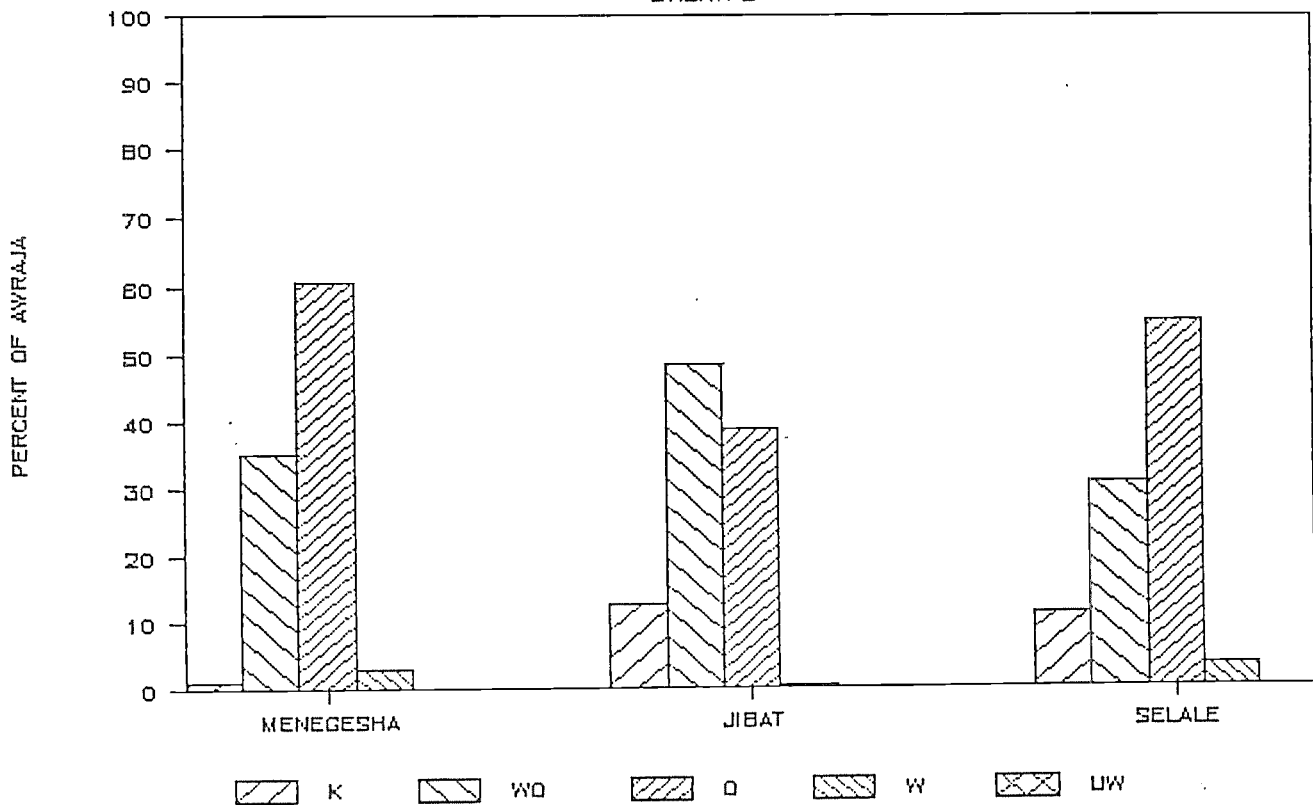
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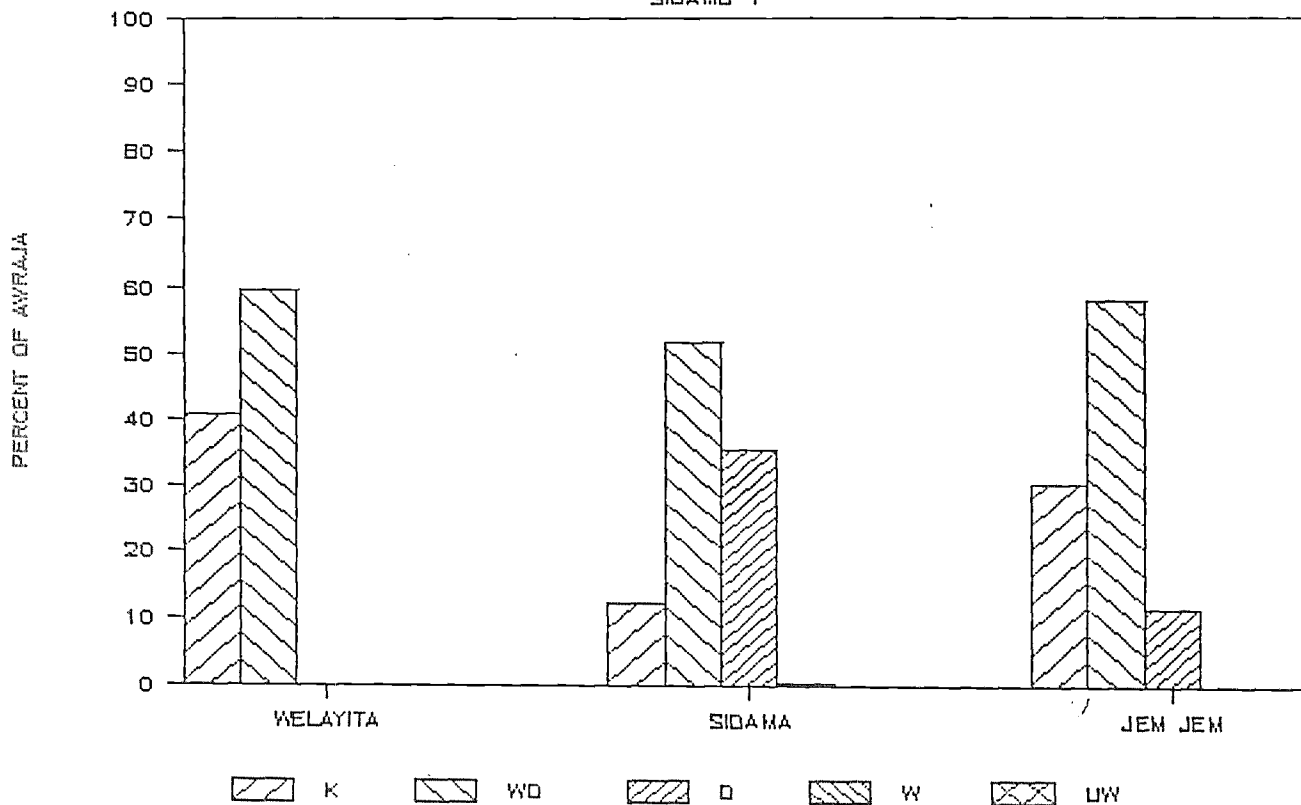
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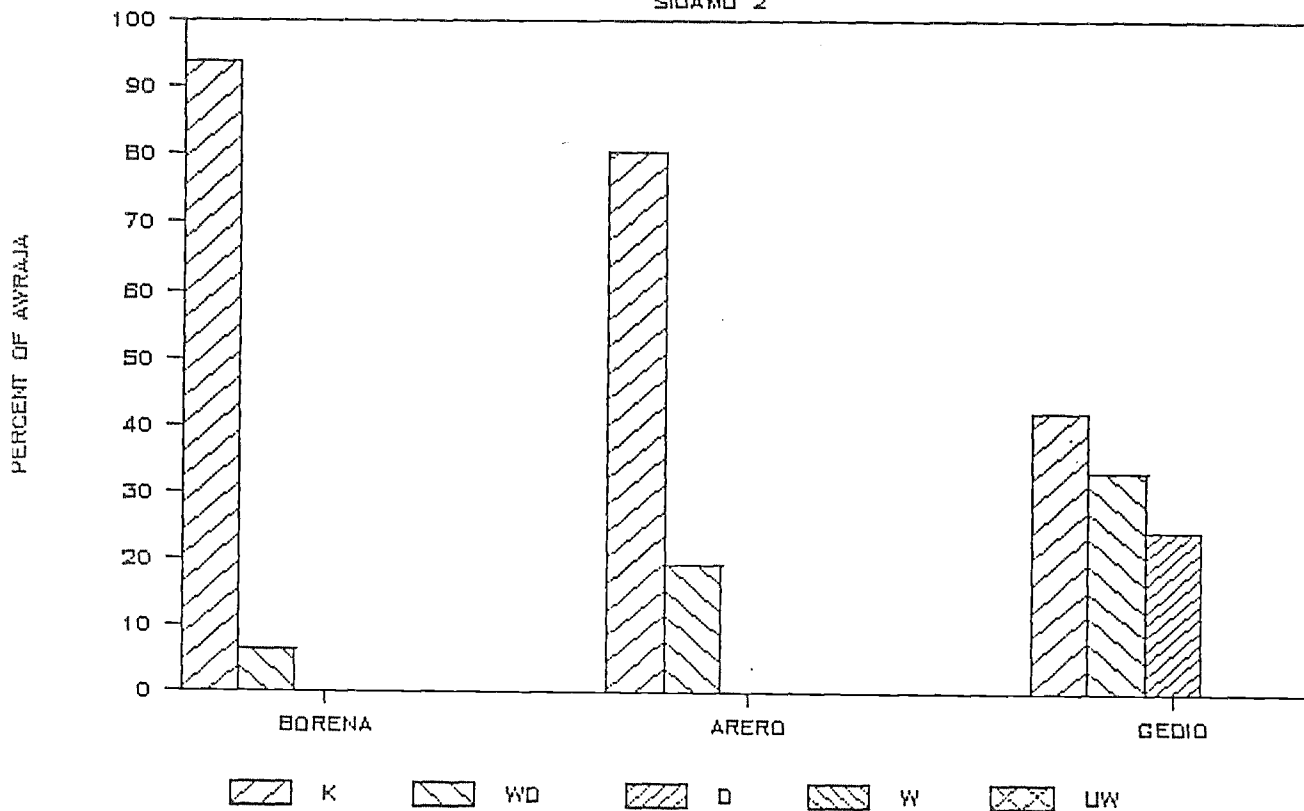
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SIDAMO 1



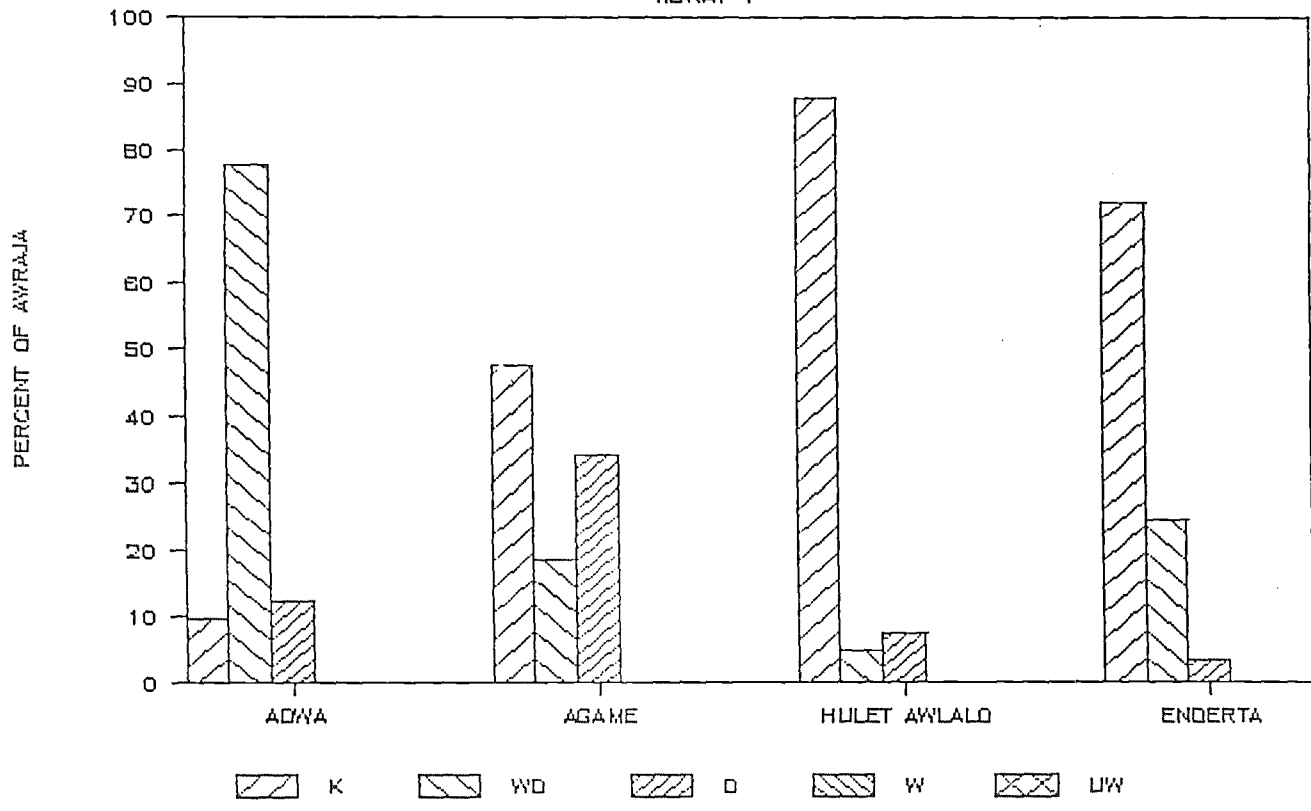
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SIDAMO 2



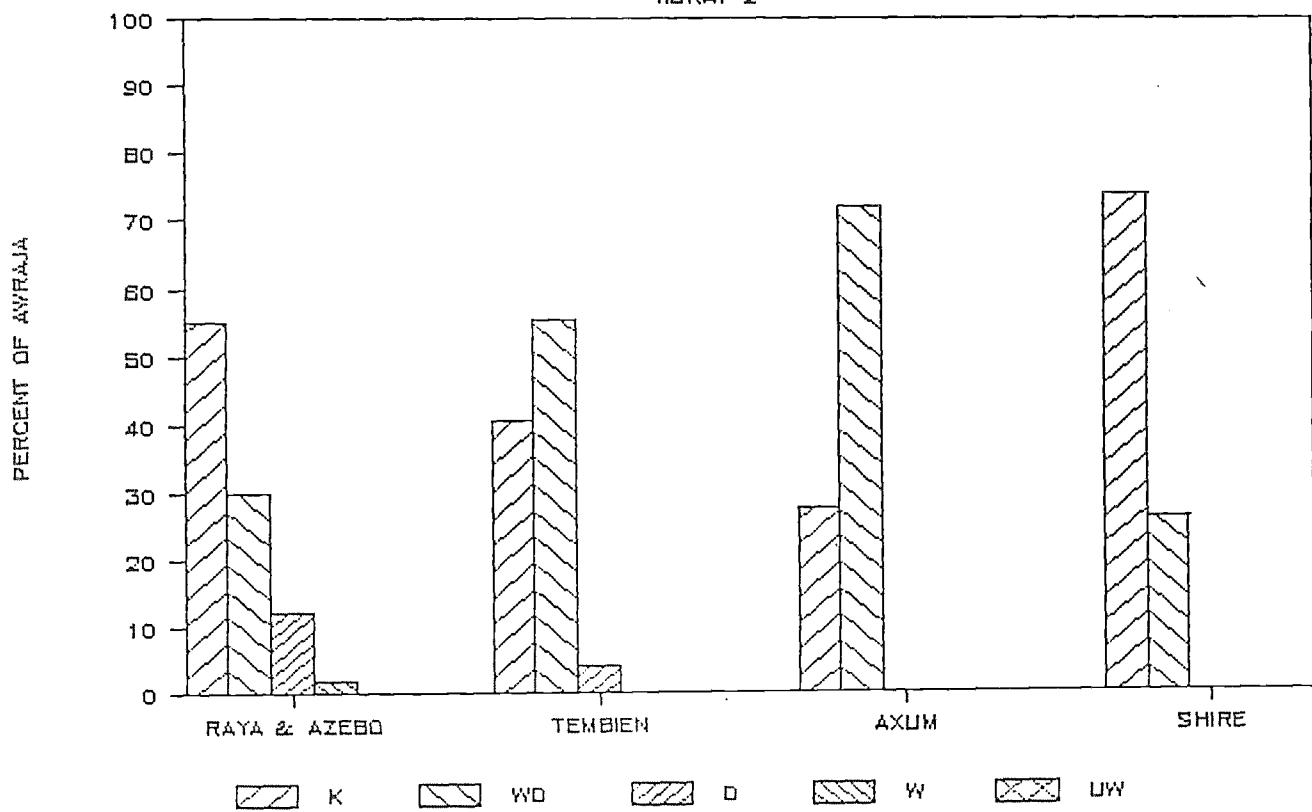
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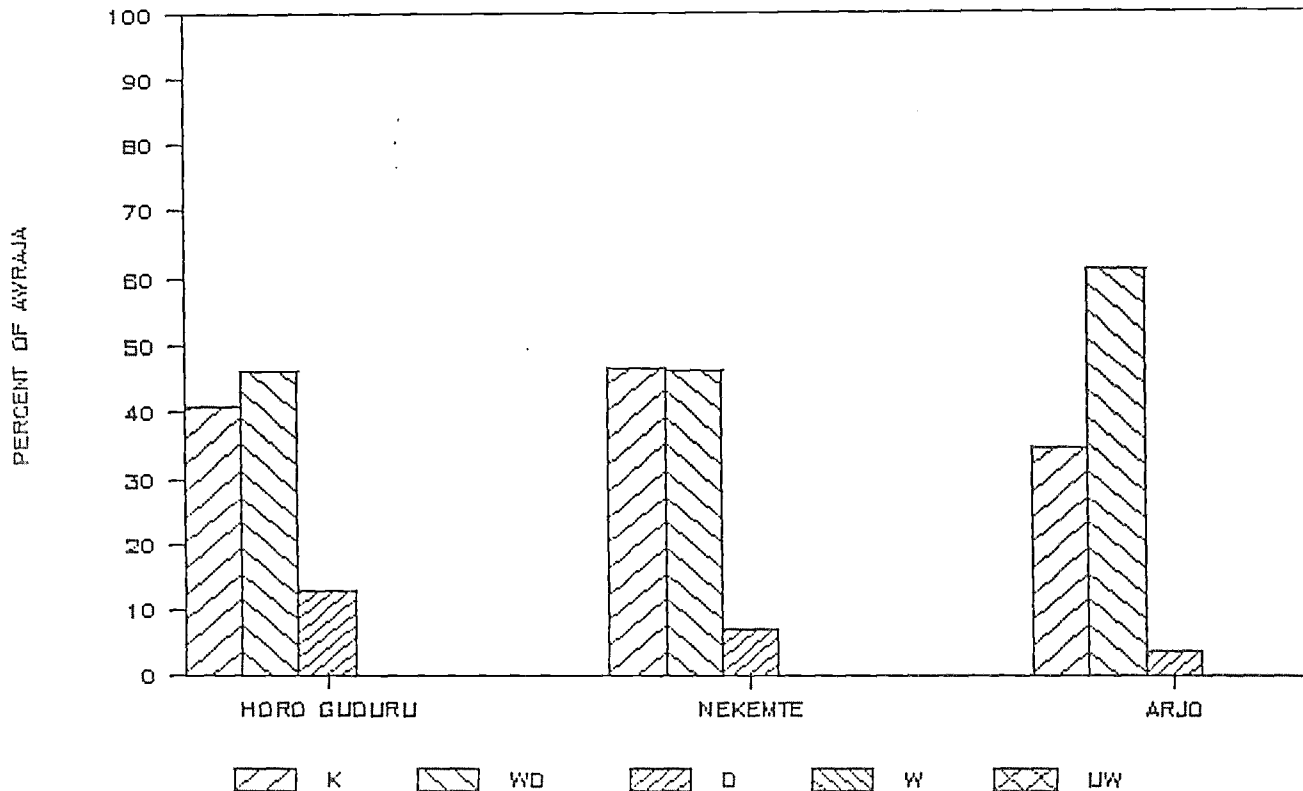
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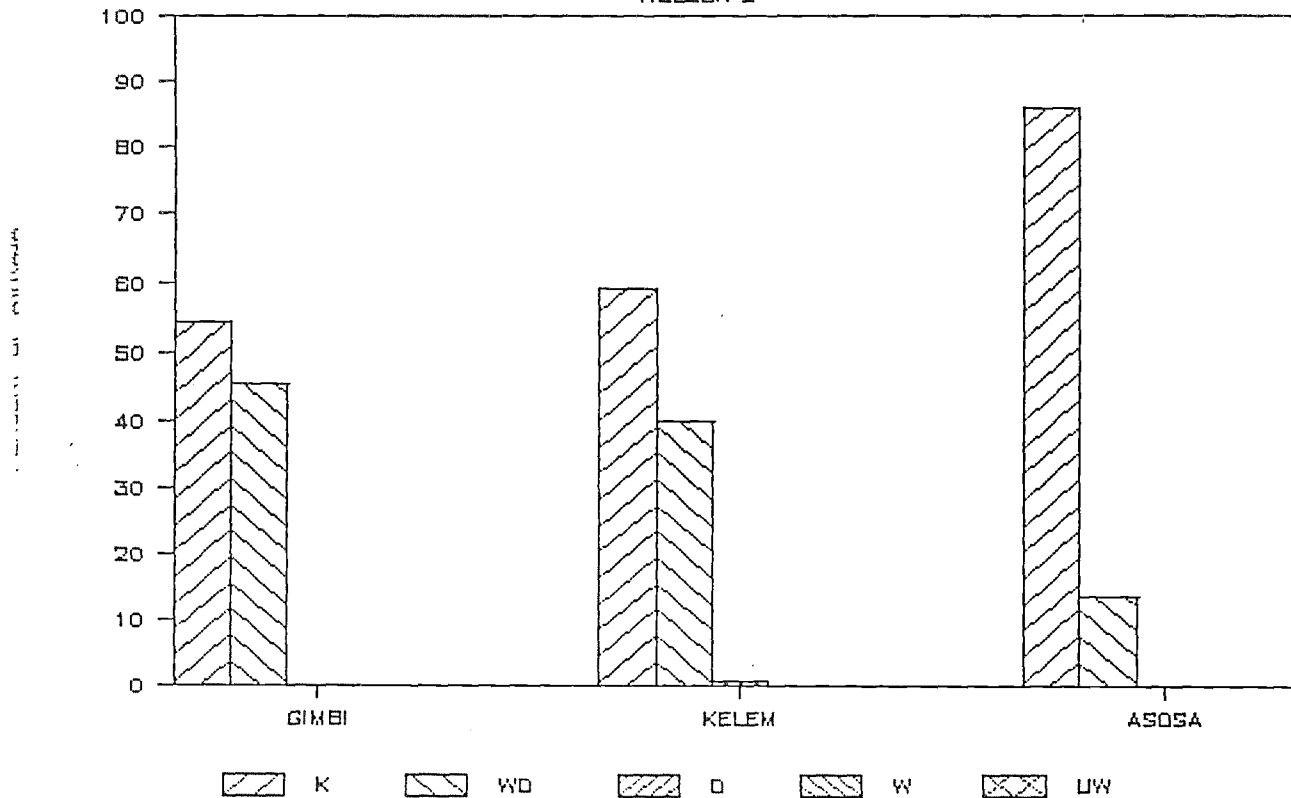
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WELEGA 1



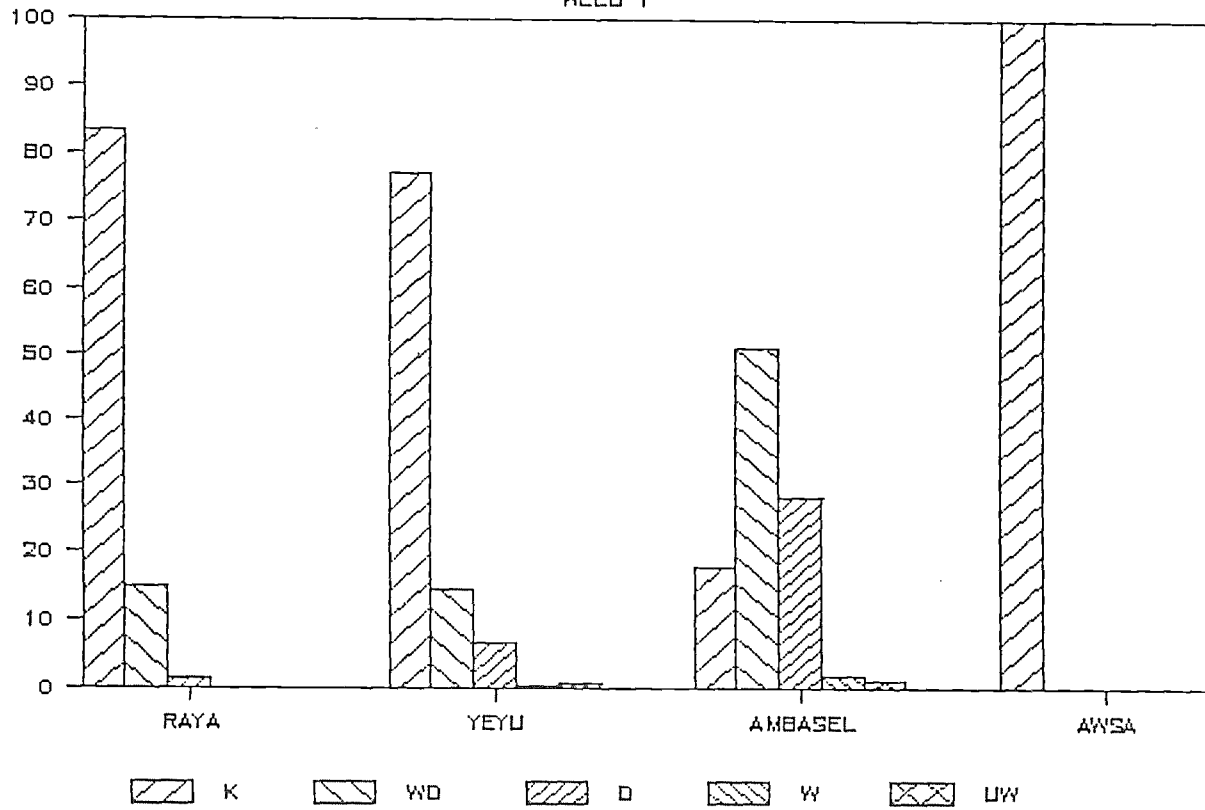
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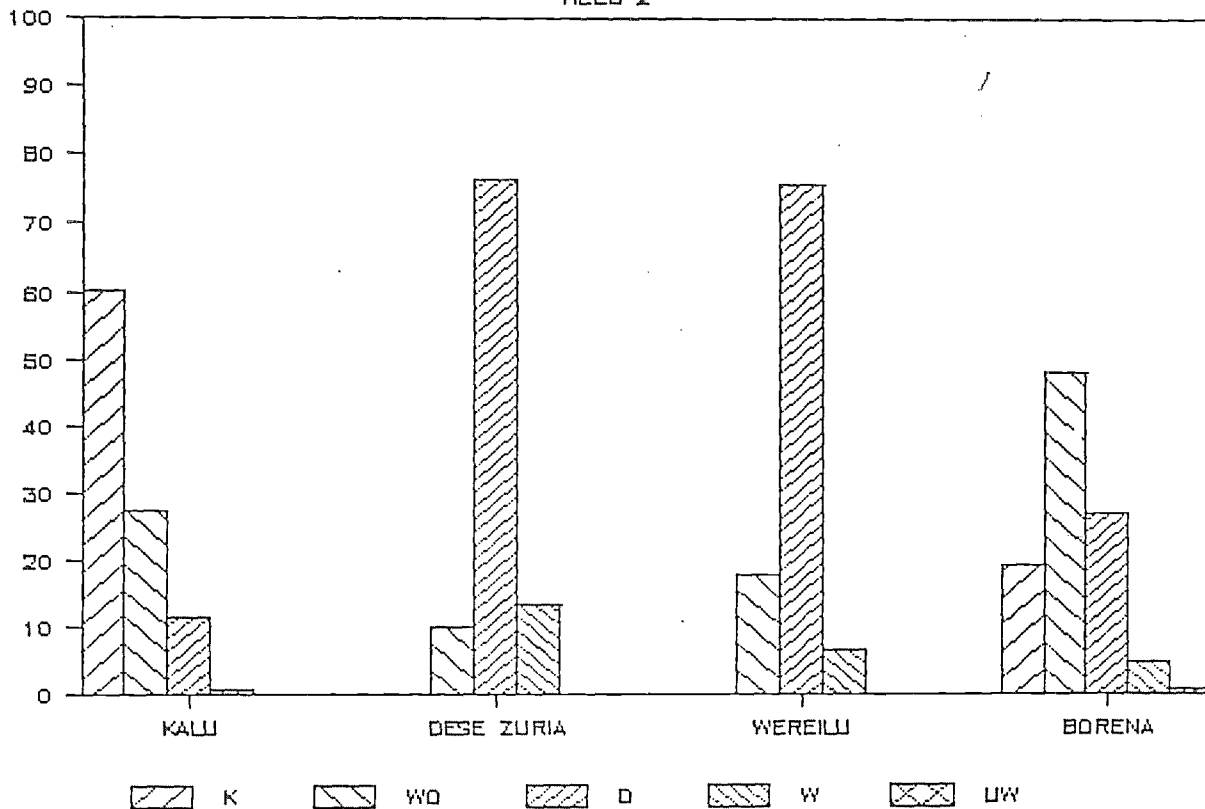
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WELO 1



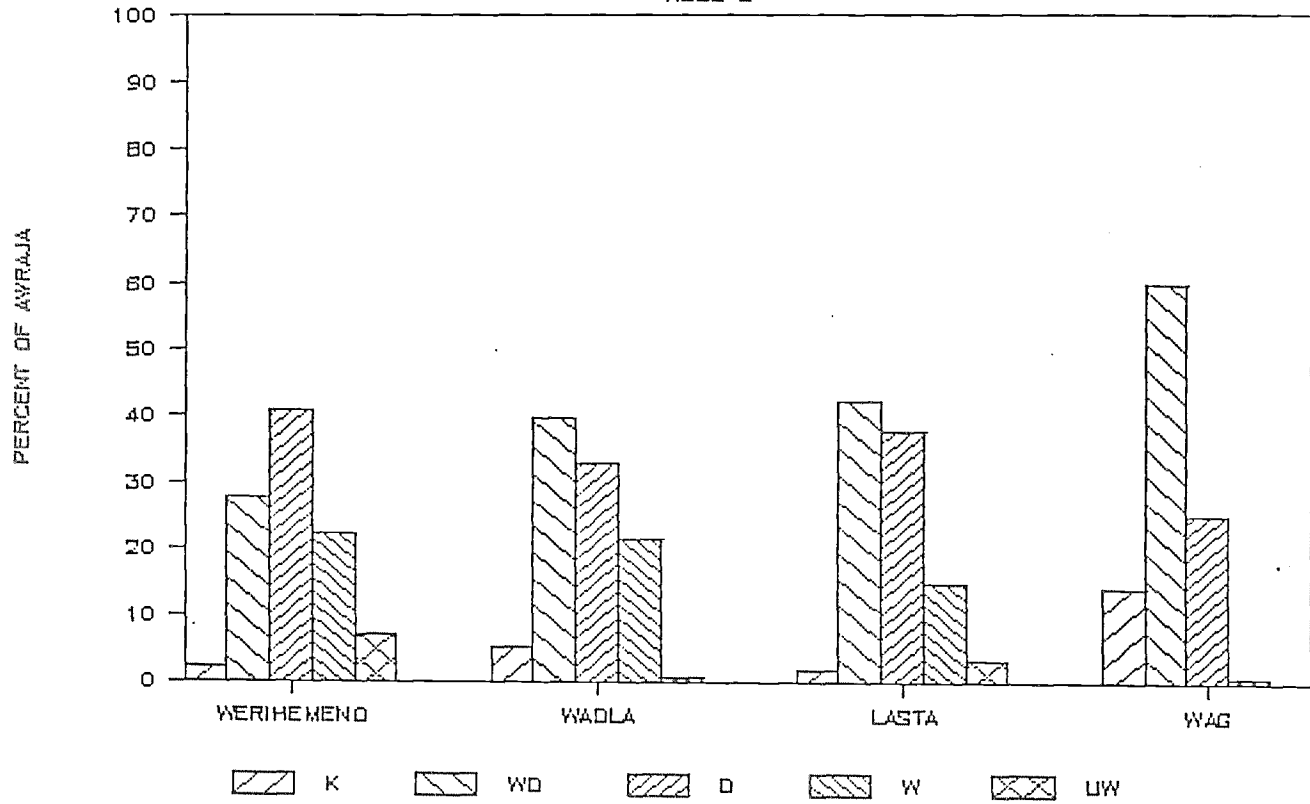
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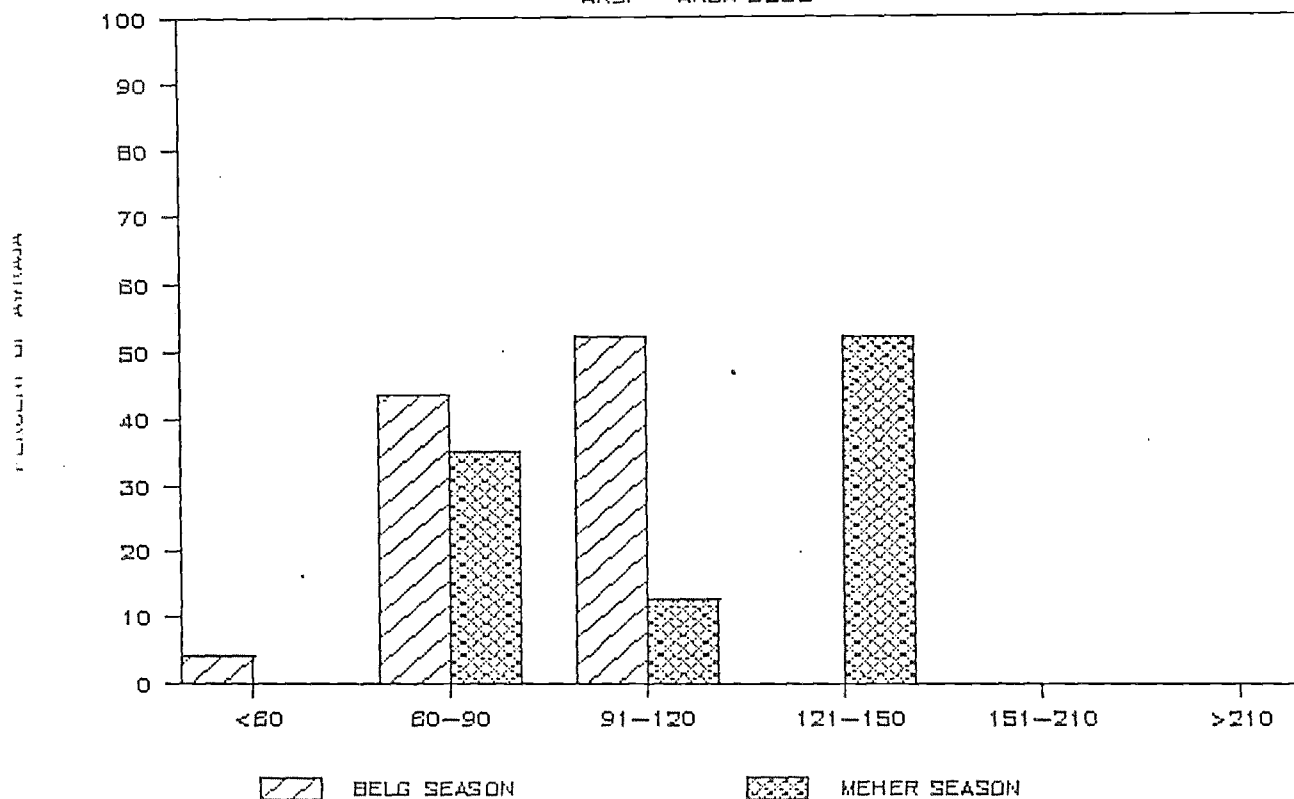
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DEPENDABLE GROWING PERIOD

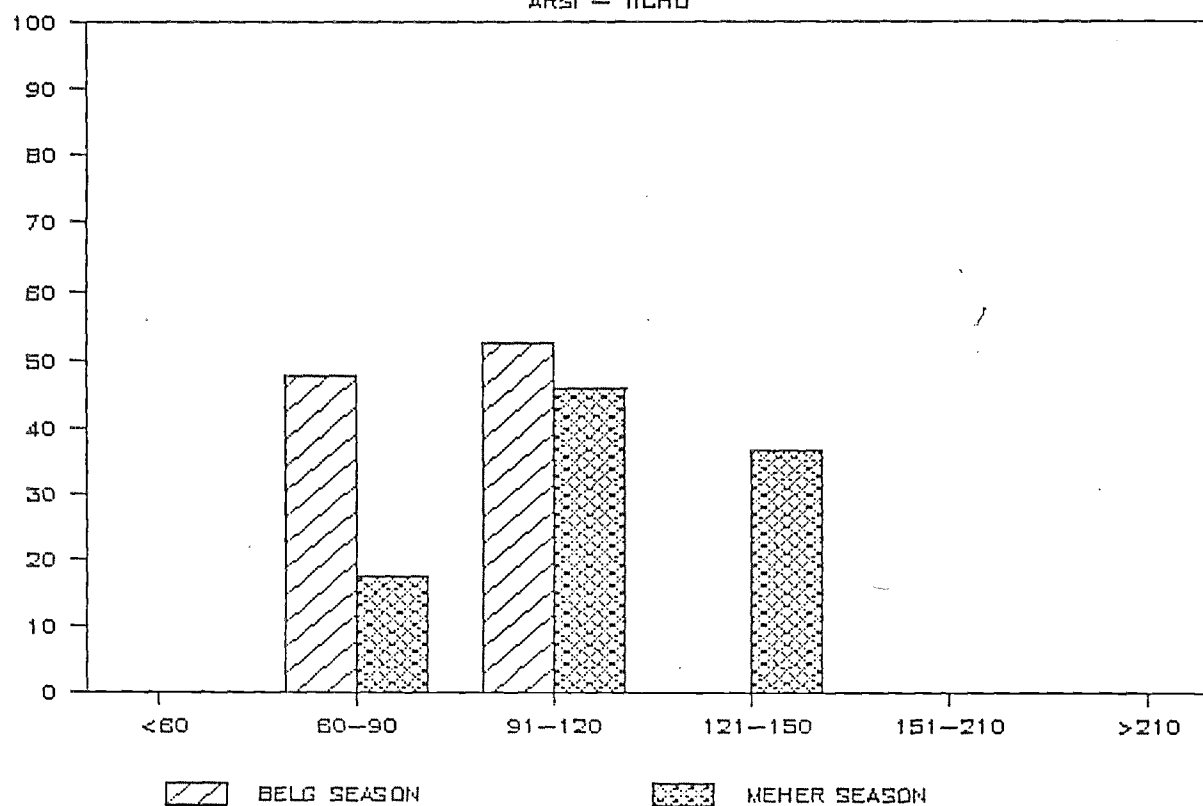
DEPENDABLE GROWING PERIOD - DAYS

ARSI - ARBA GUGU



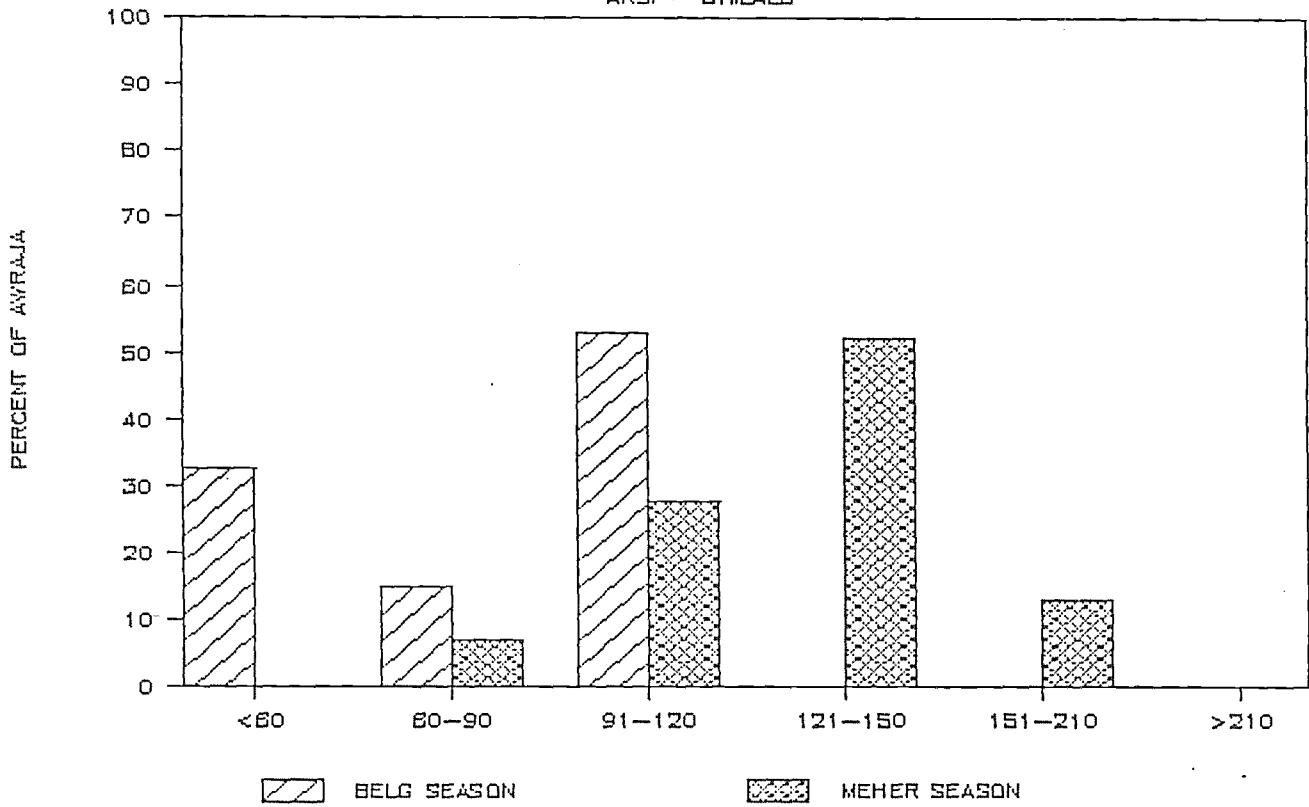
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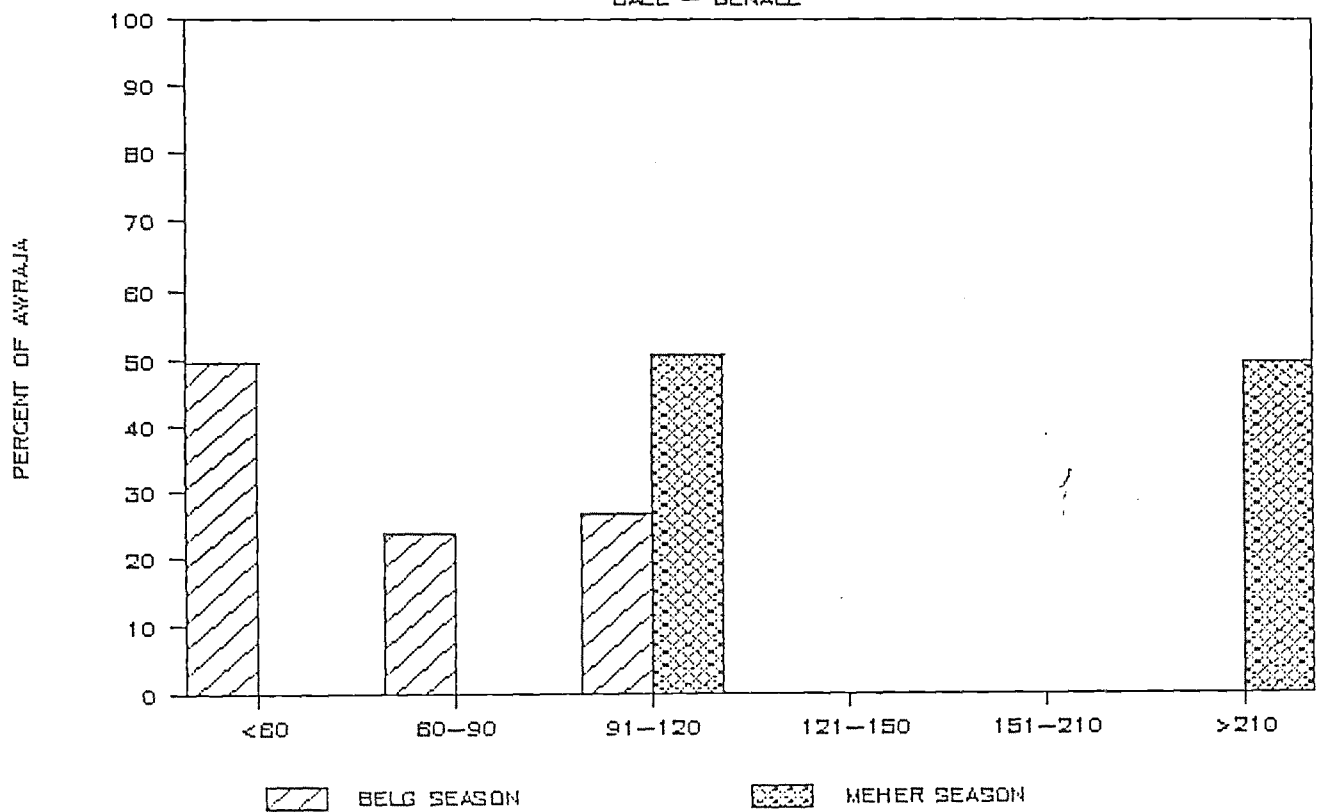
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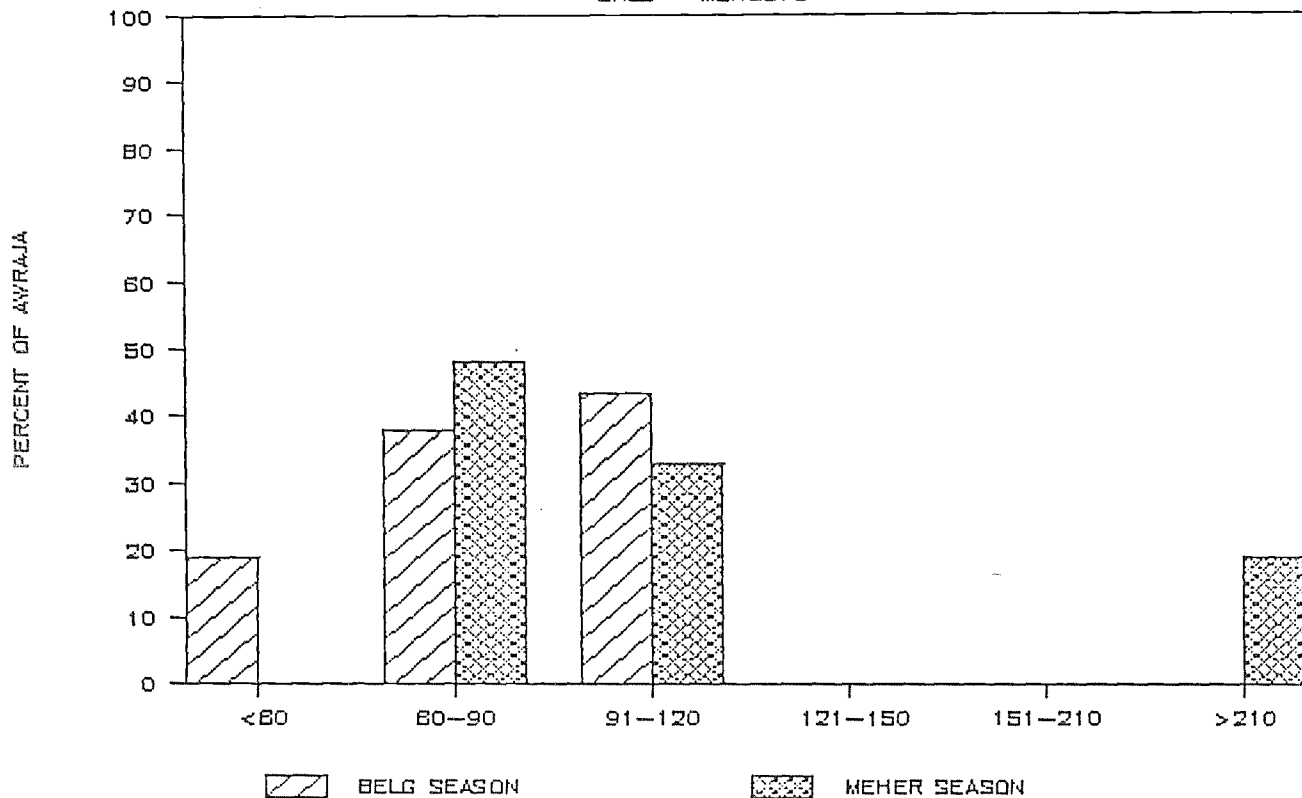
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BALE - GENALE



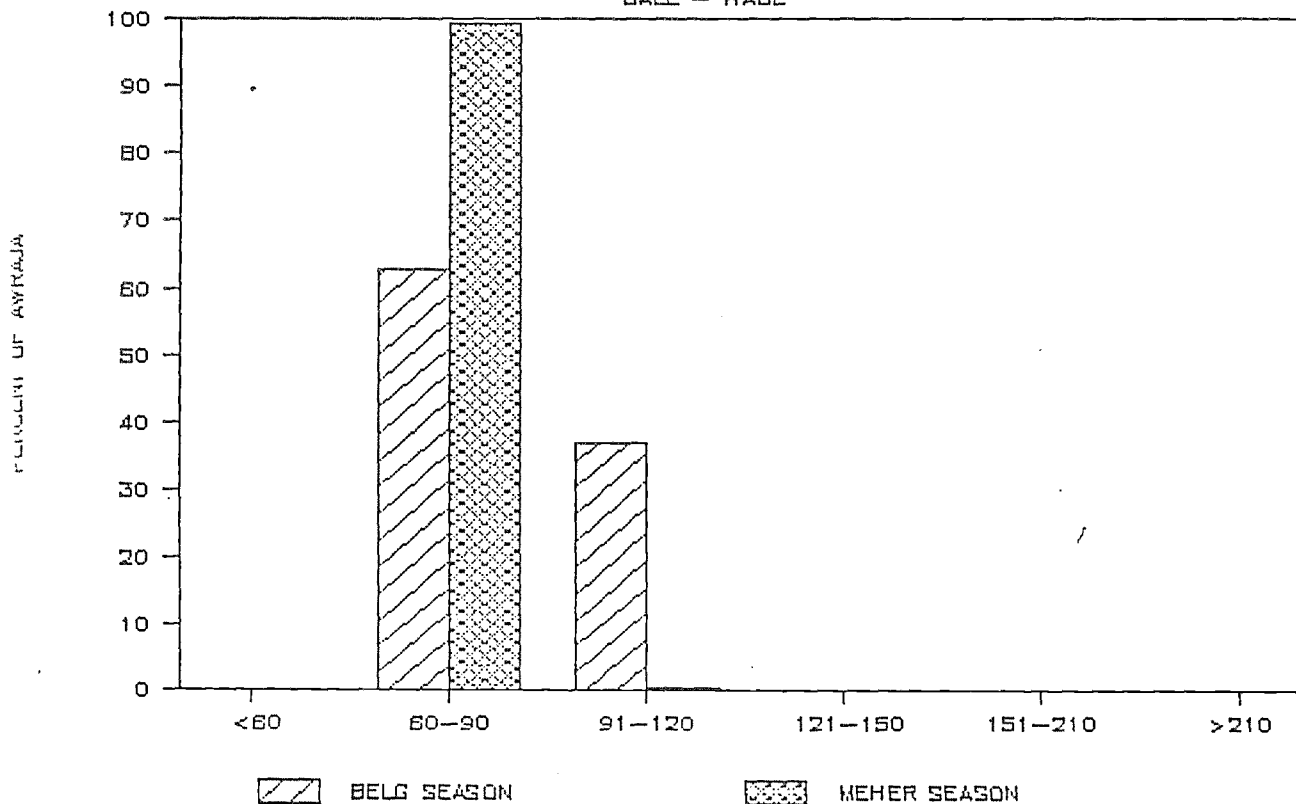
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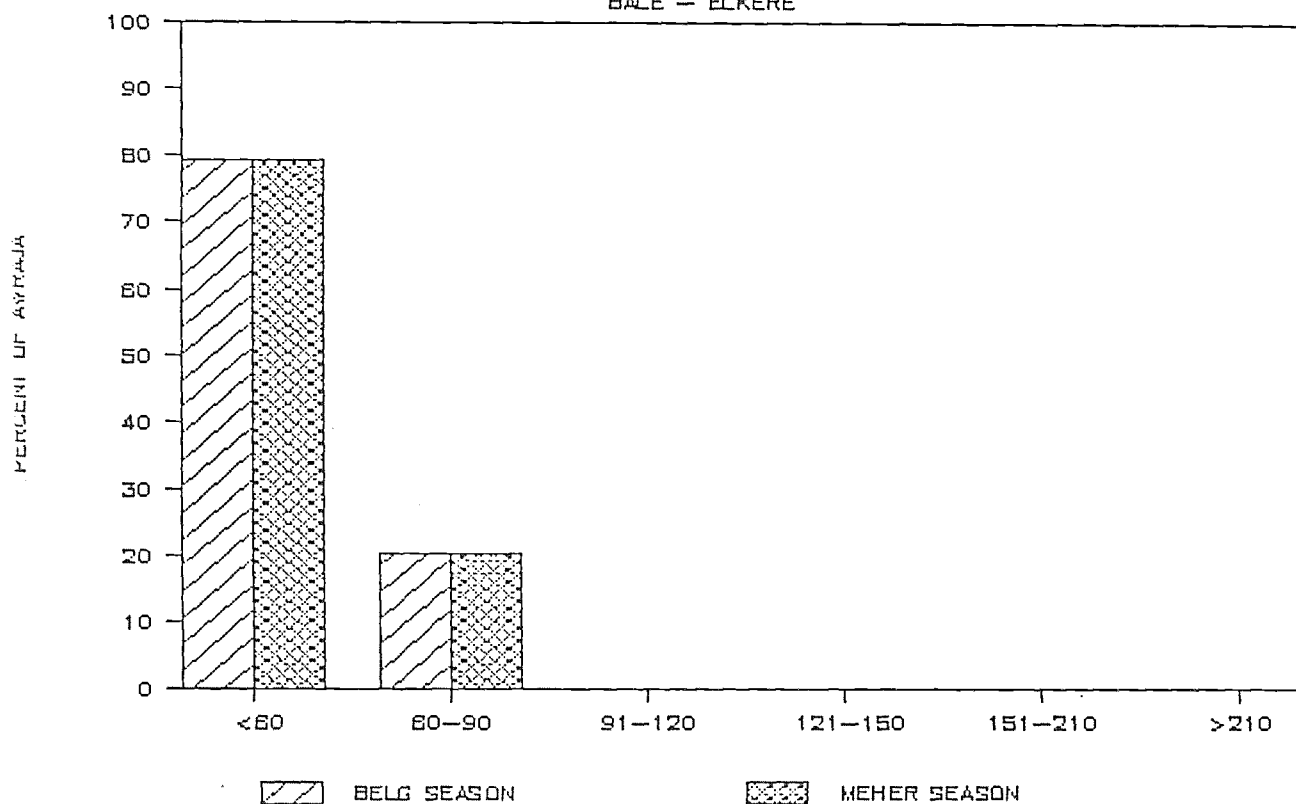
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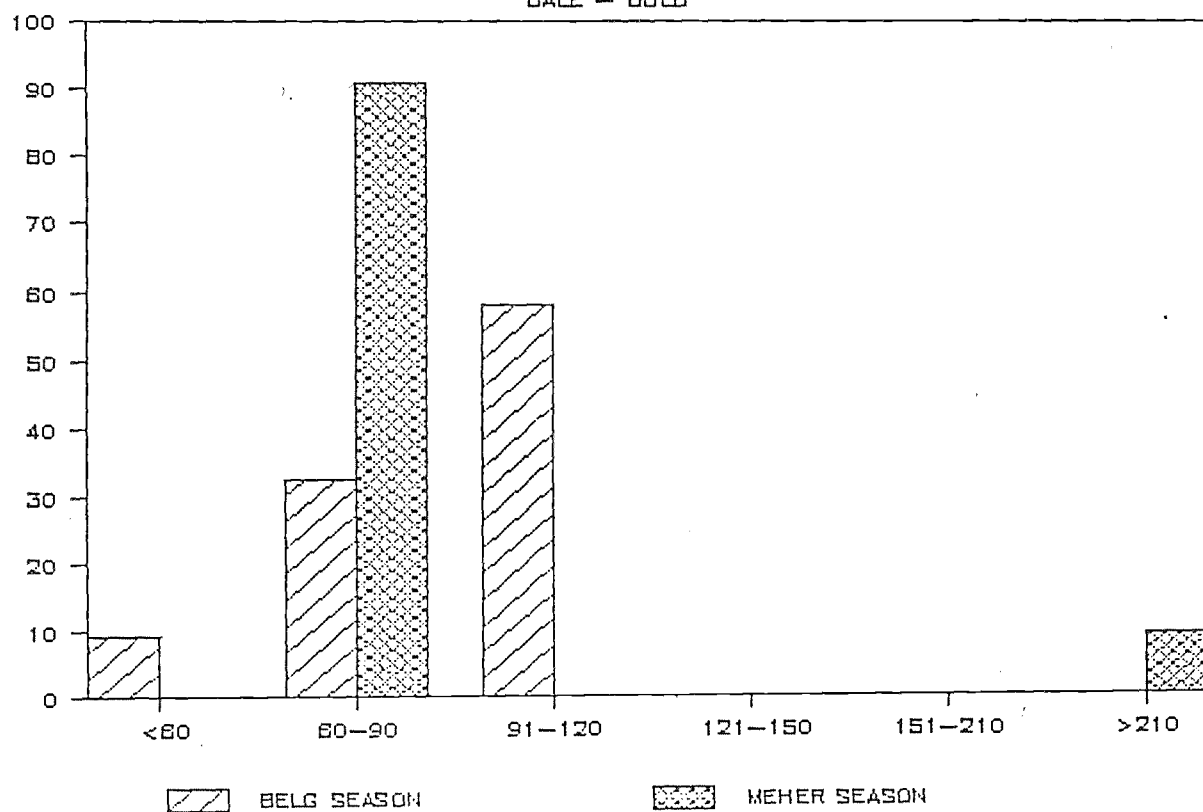
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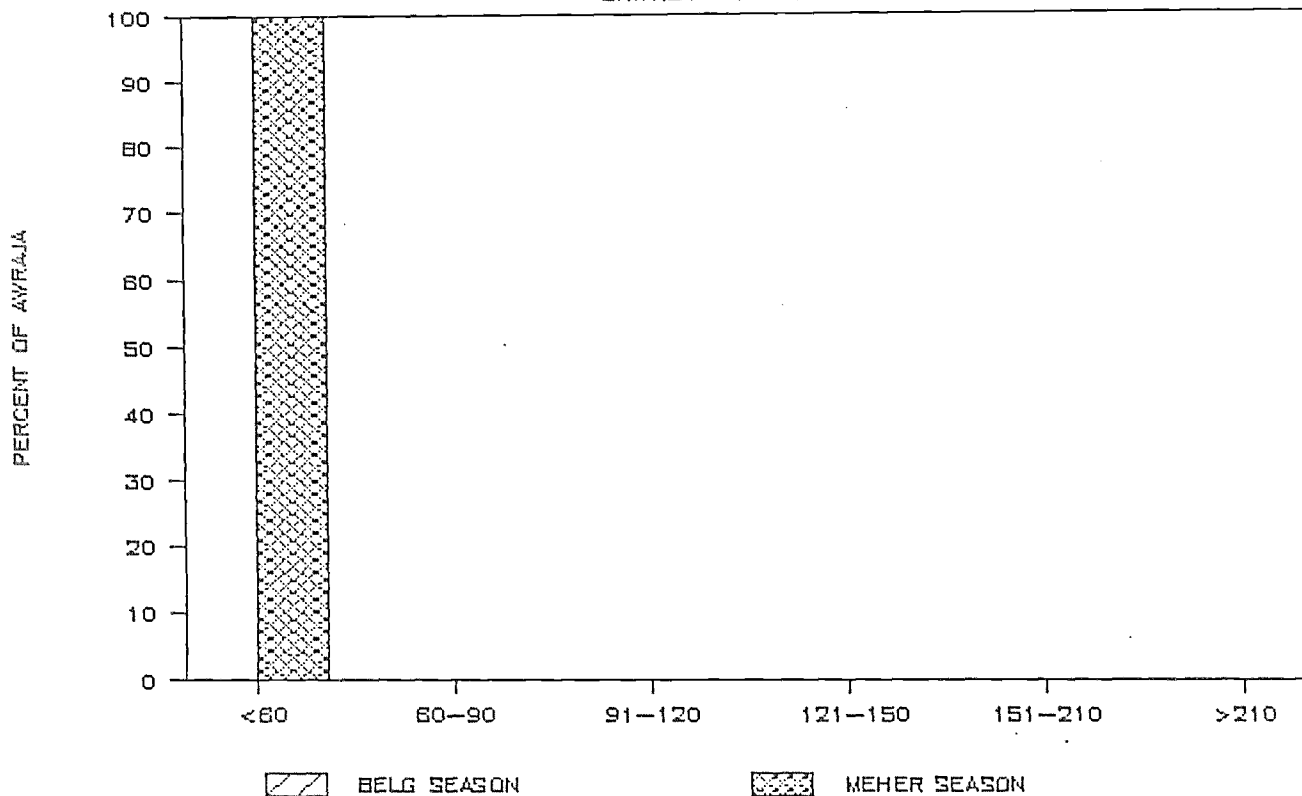
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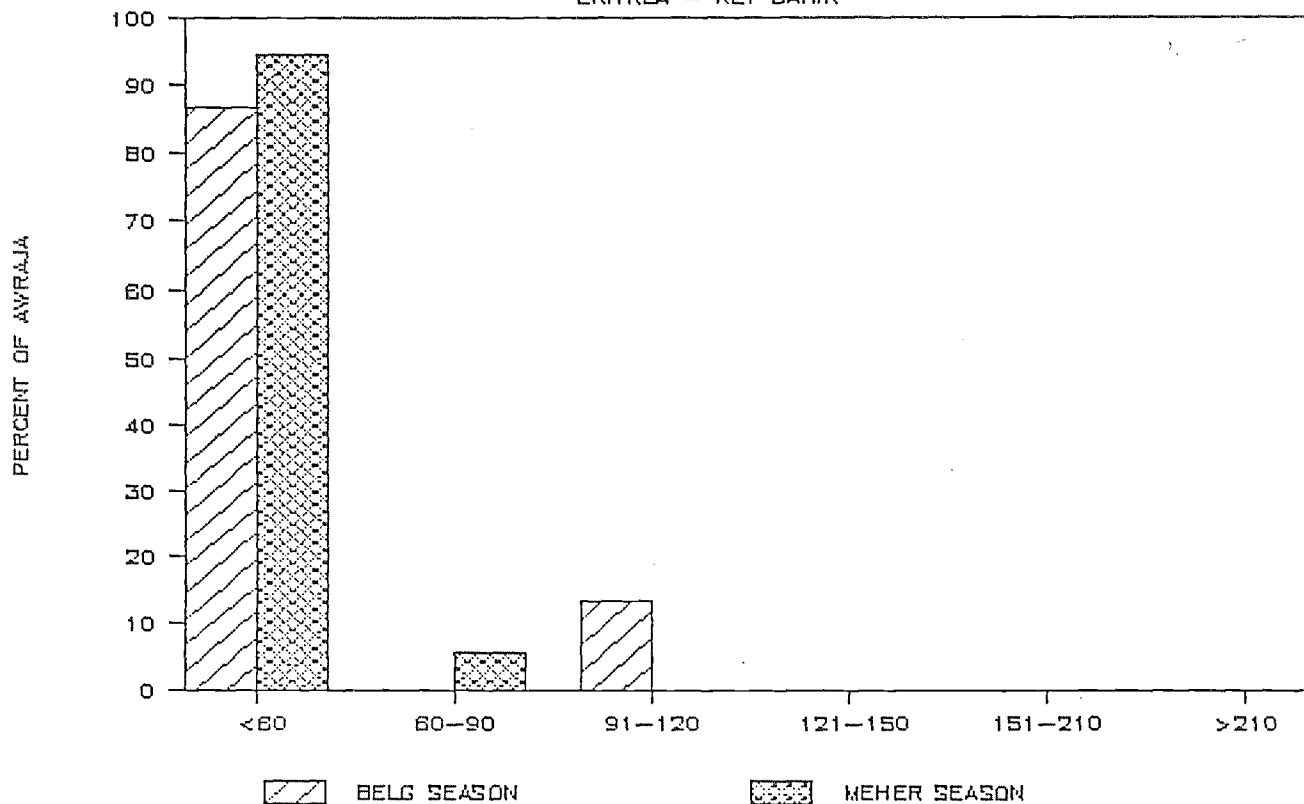
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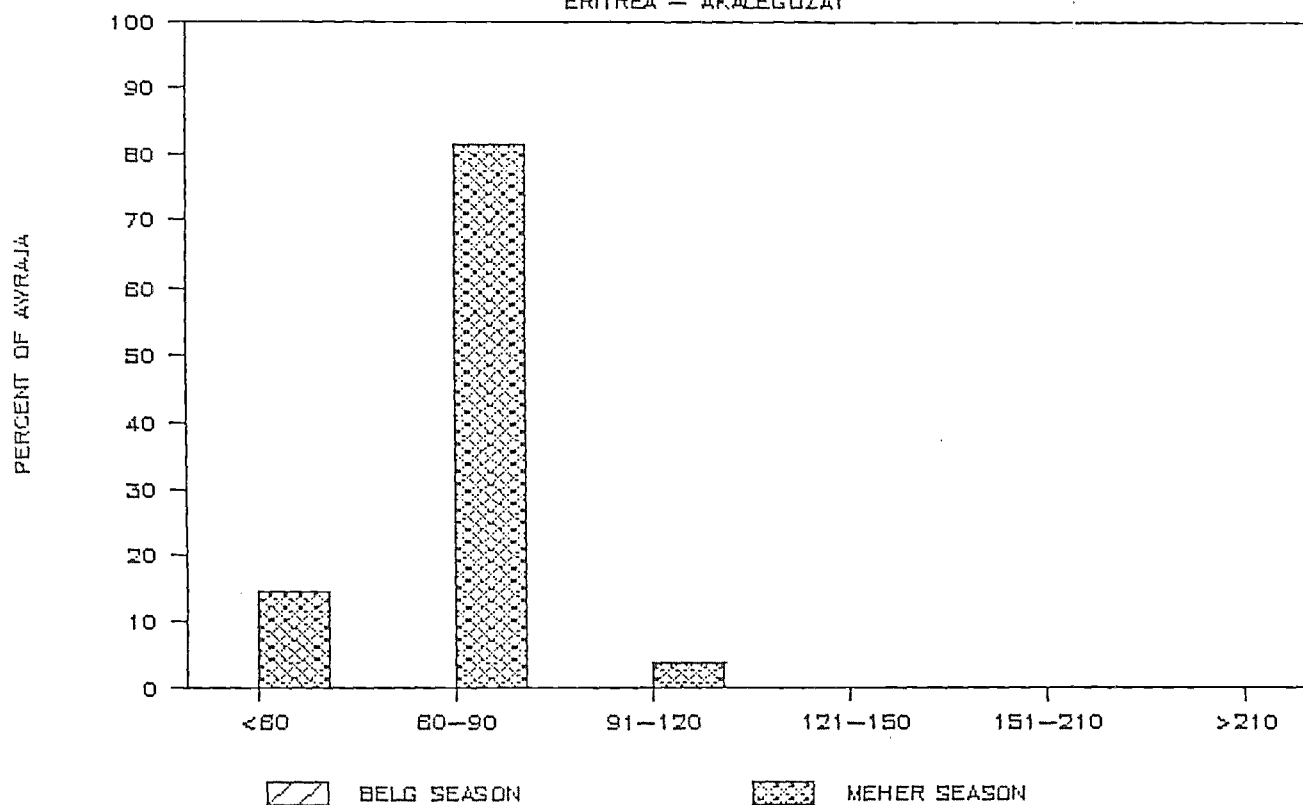
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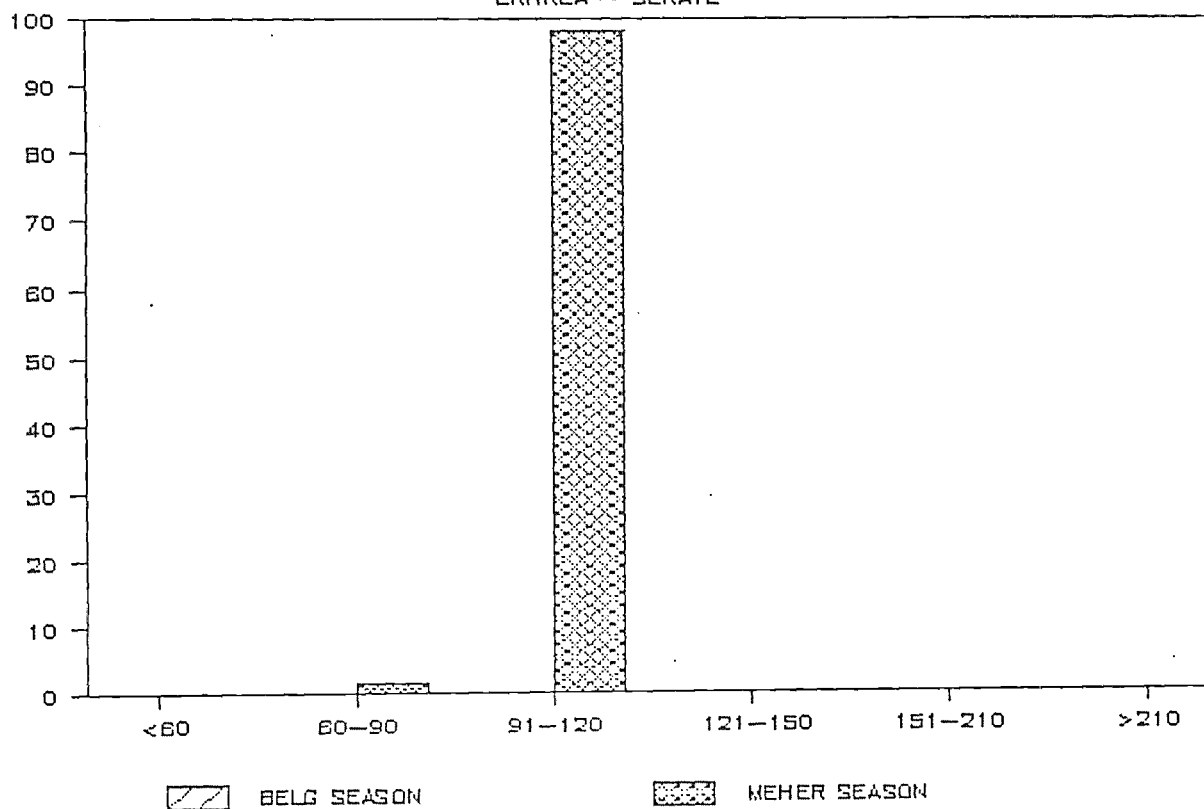
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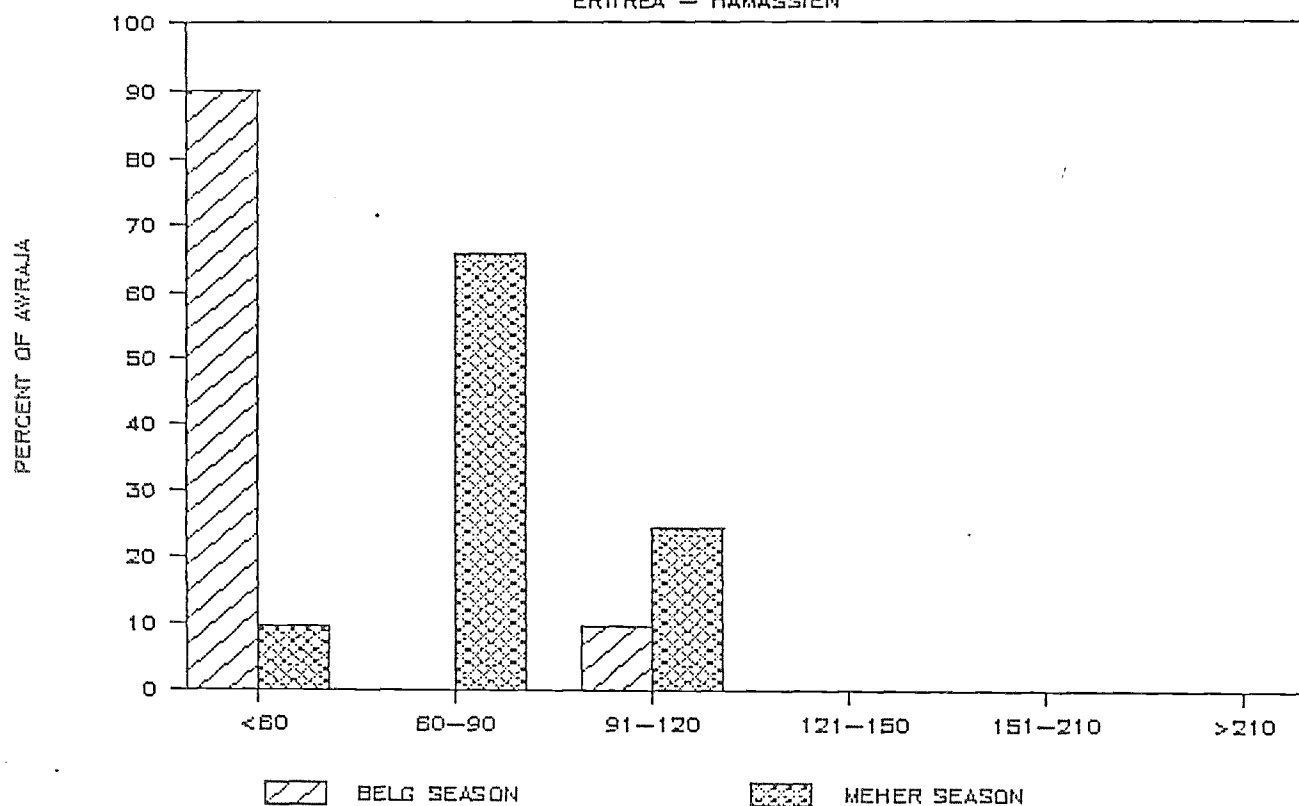
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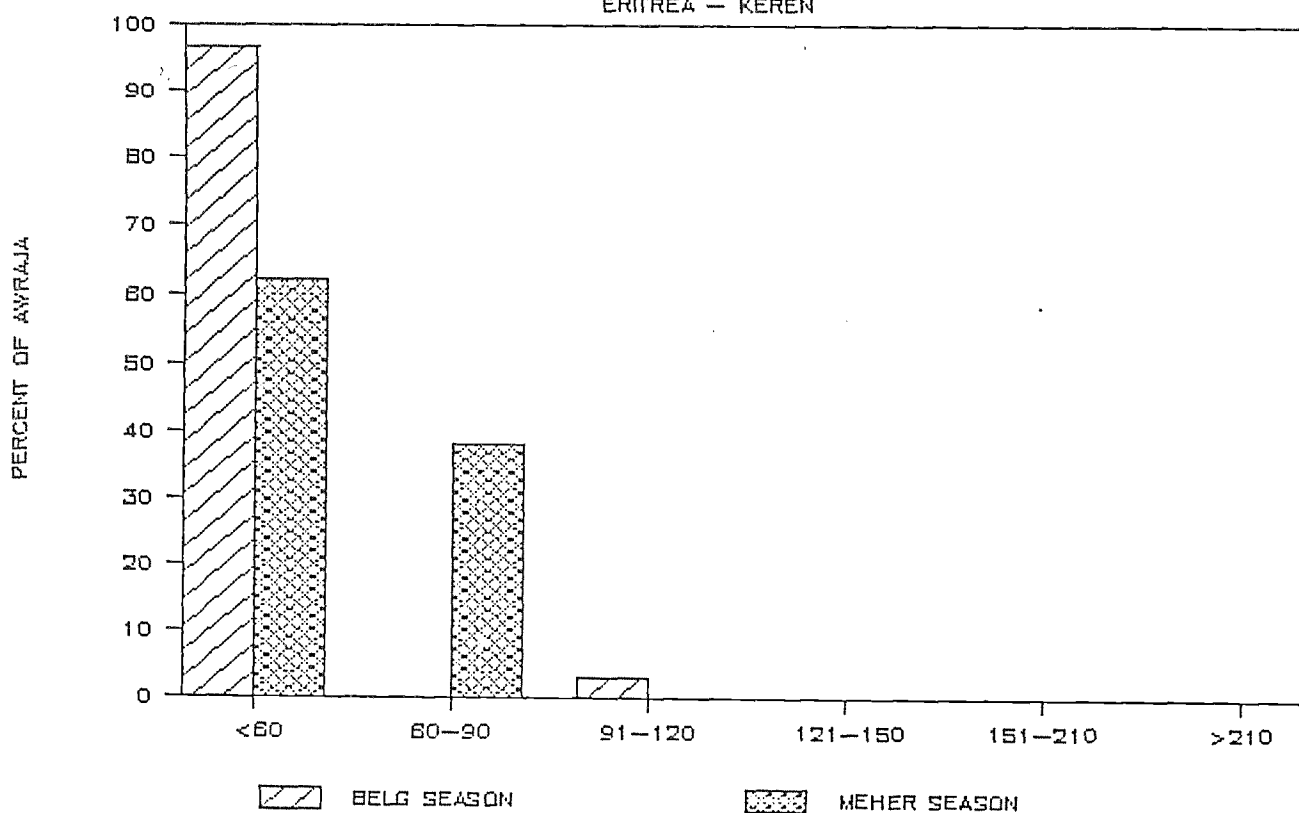
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ERITREA — HAMASSIEM



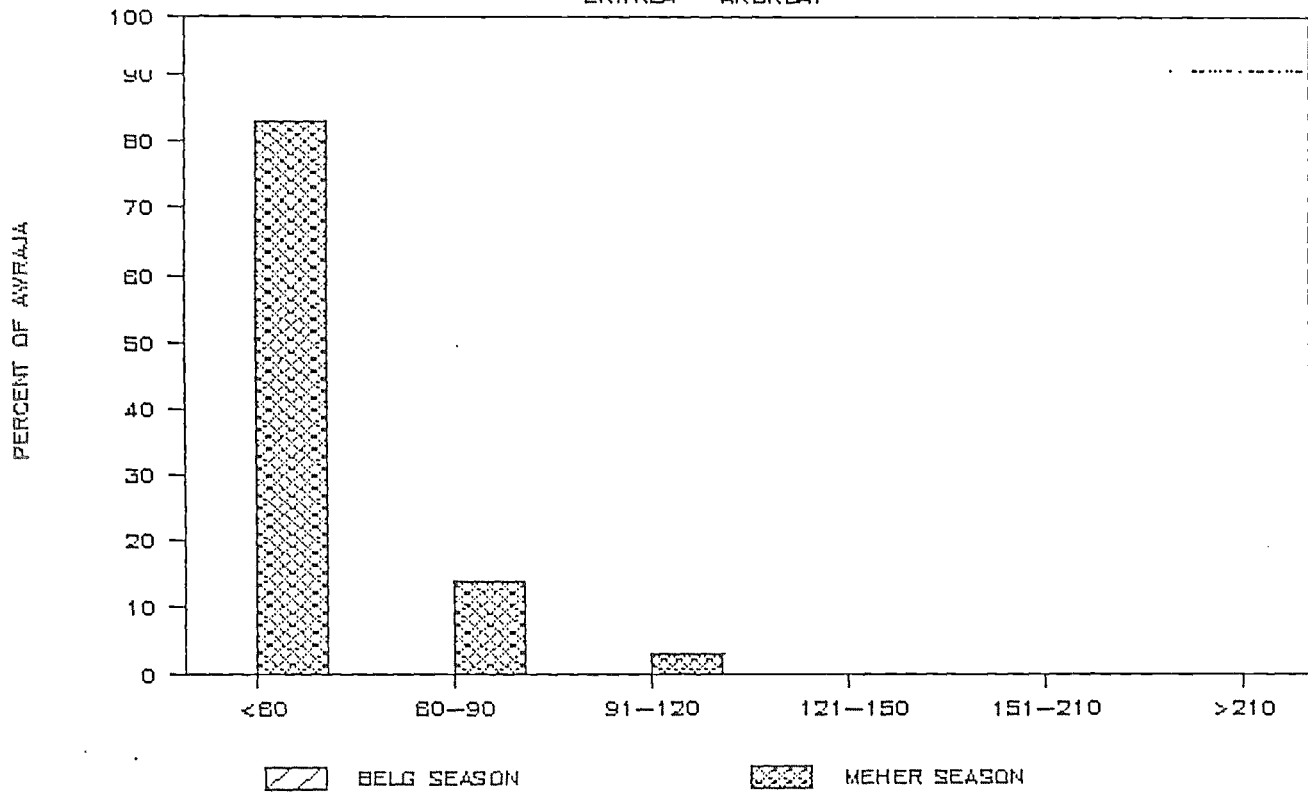
DEPENDABLE GROWING PERIOD — DAYS

ERITREA — KEREN



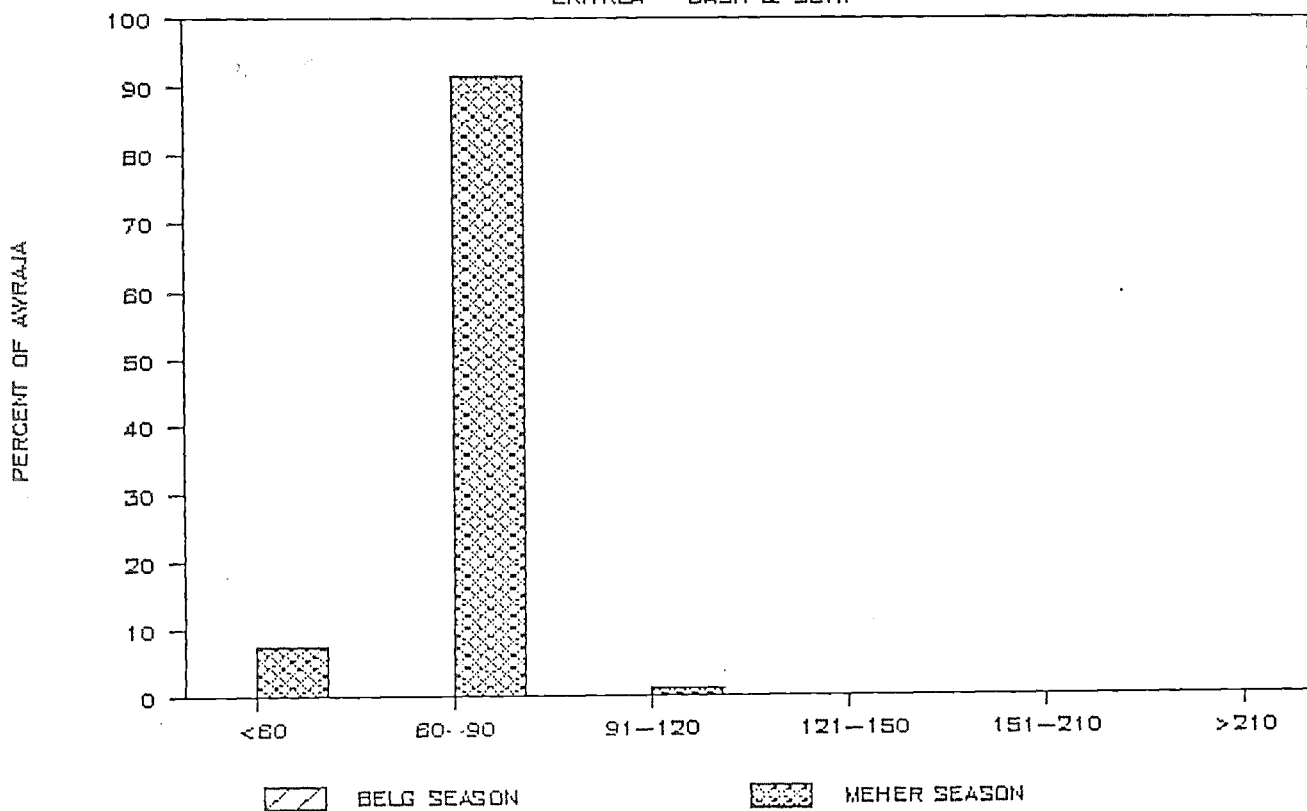
DEPENDABLE GROWING PERIOD - DAYS

ERITREA - AKORDAT



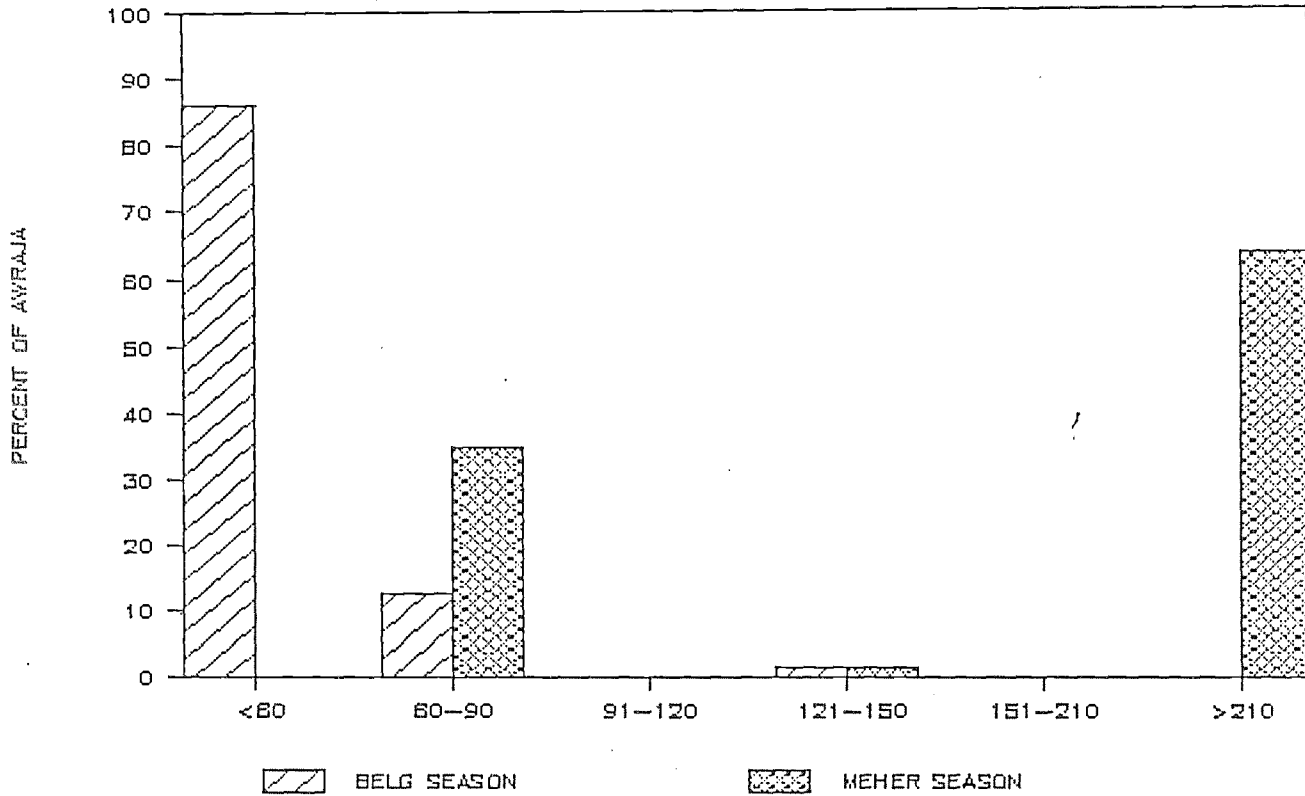
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ERITREA - GASH & SETIT



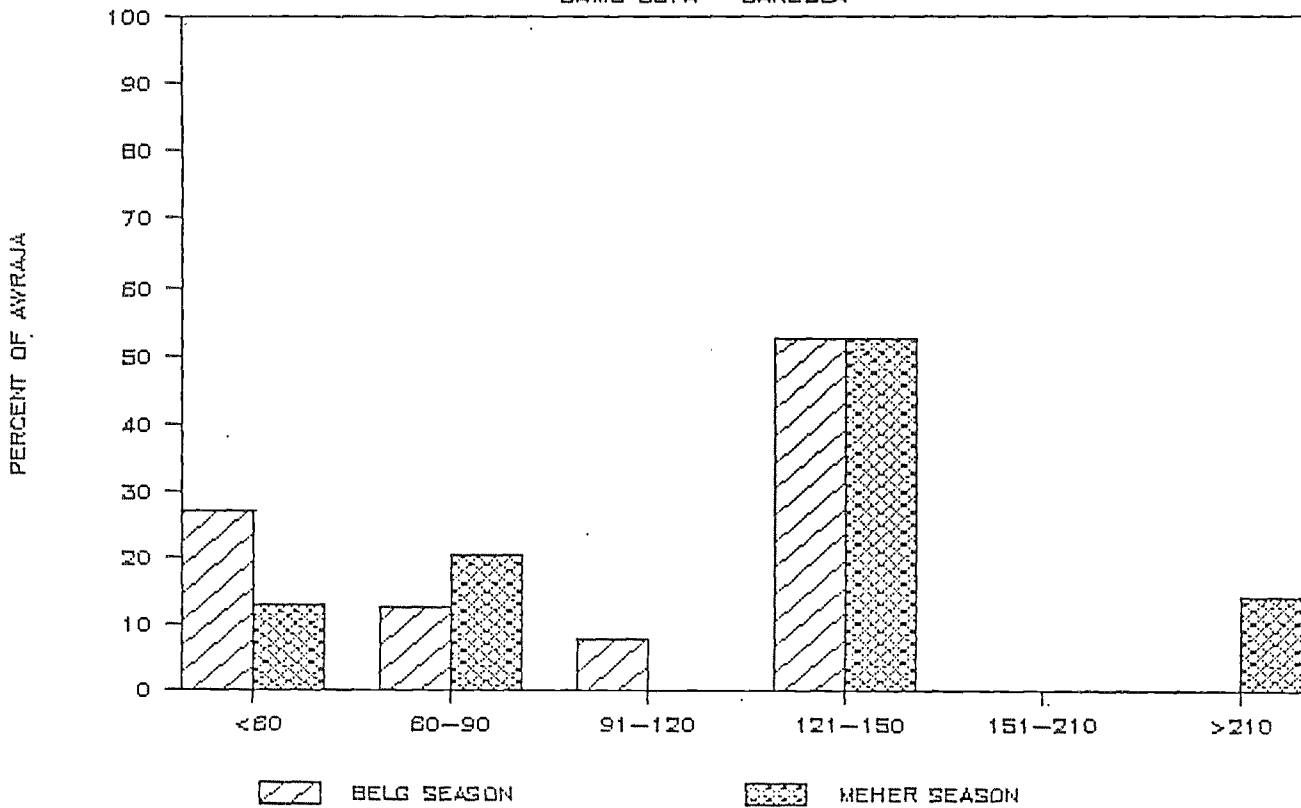
DEPENDABLE GROWING PERIOD - DAYS

GAMD GOFA - GAMD



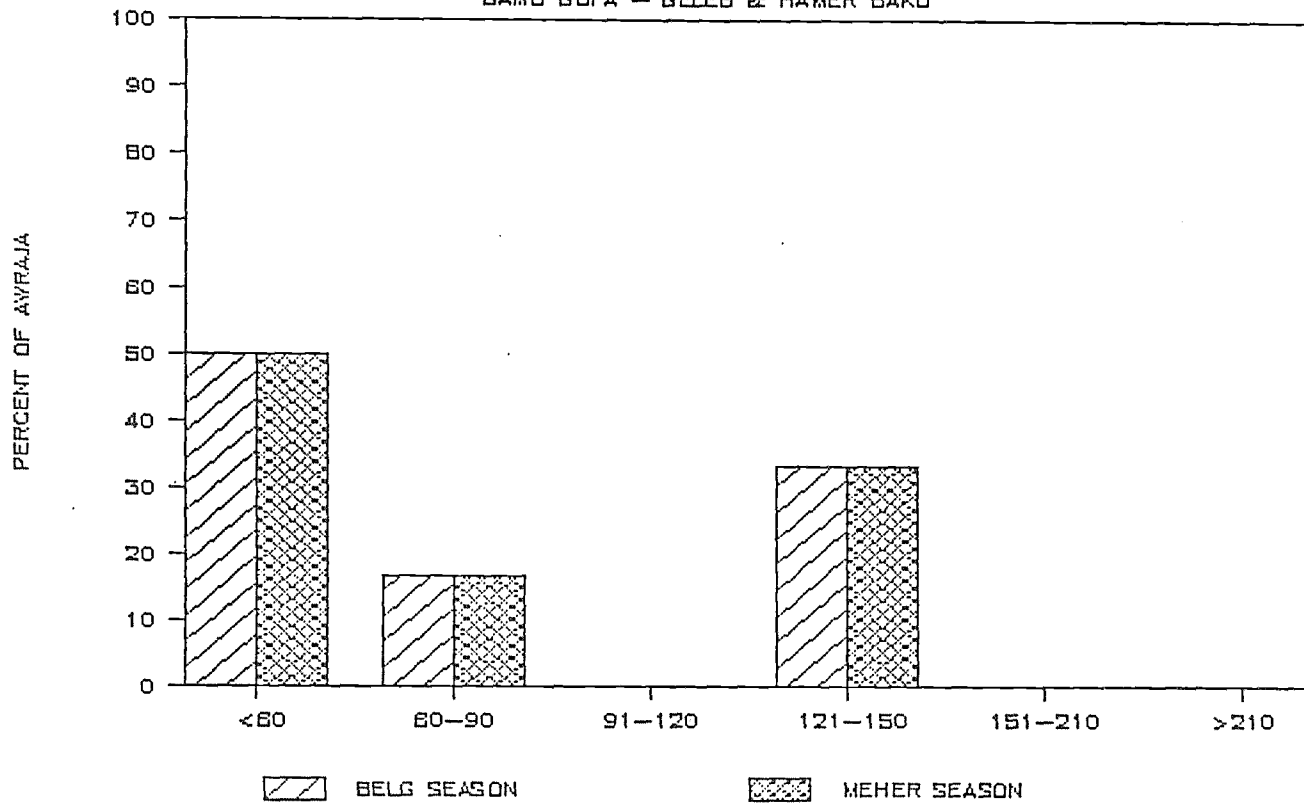
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GAMD GOFA - GARDULA



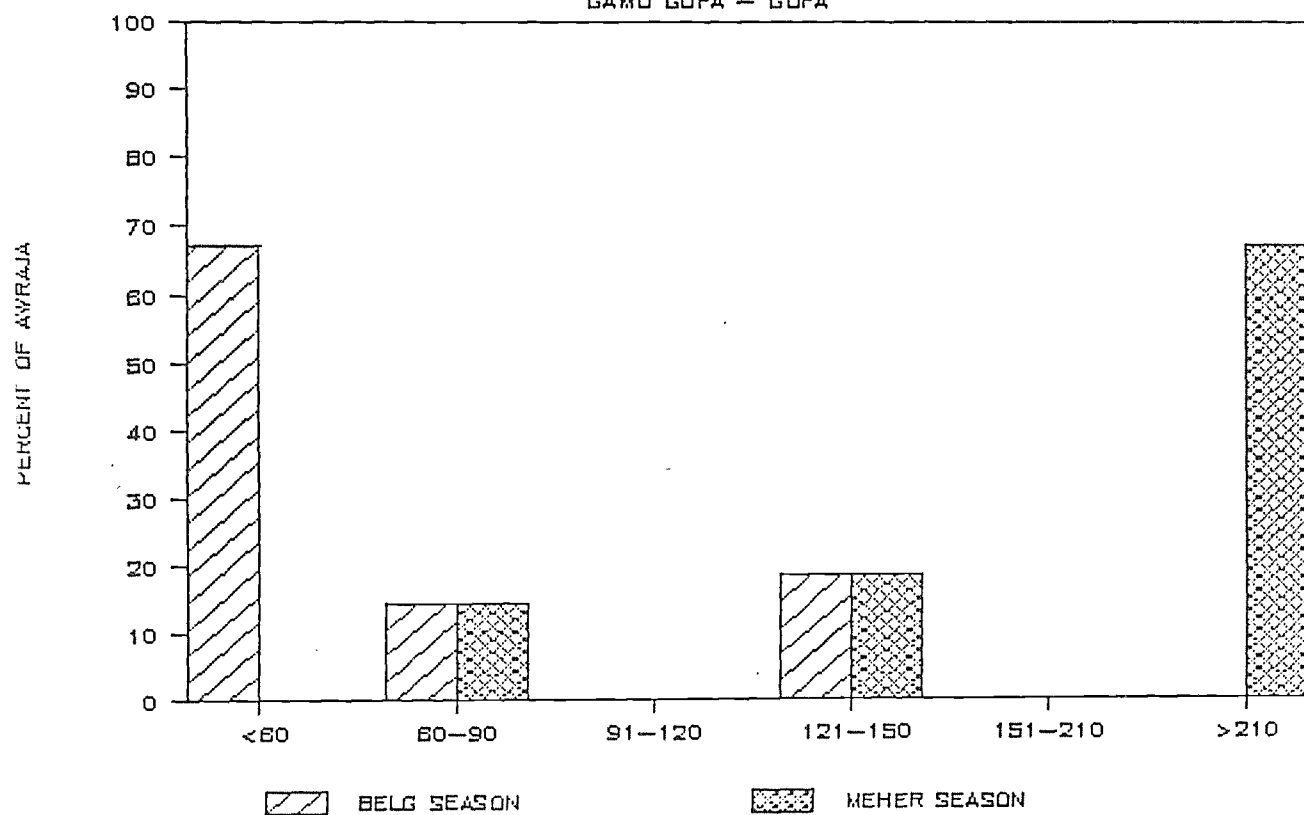
DEPENDABLE GROWING PERIOD — DAYS

GAMO GOFA — GELEB & HAMER BAKO



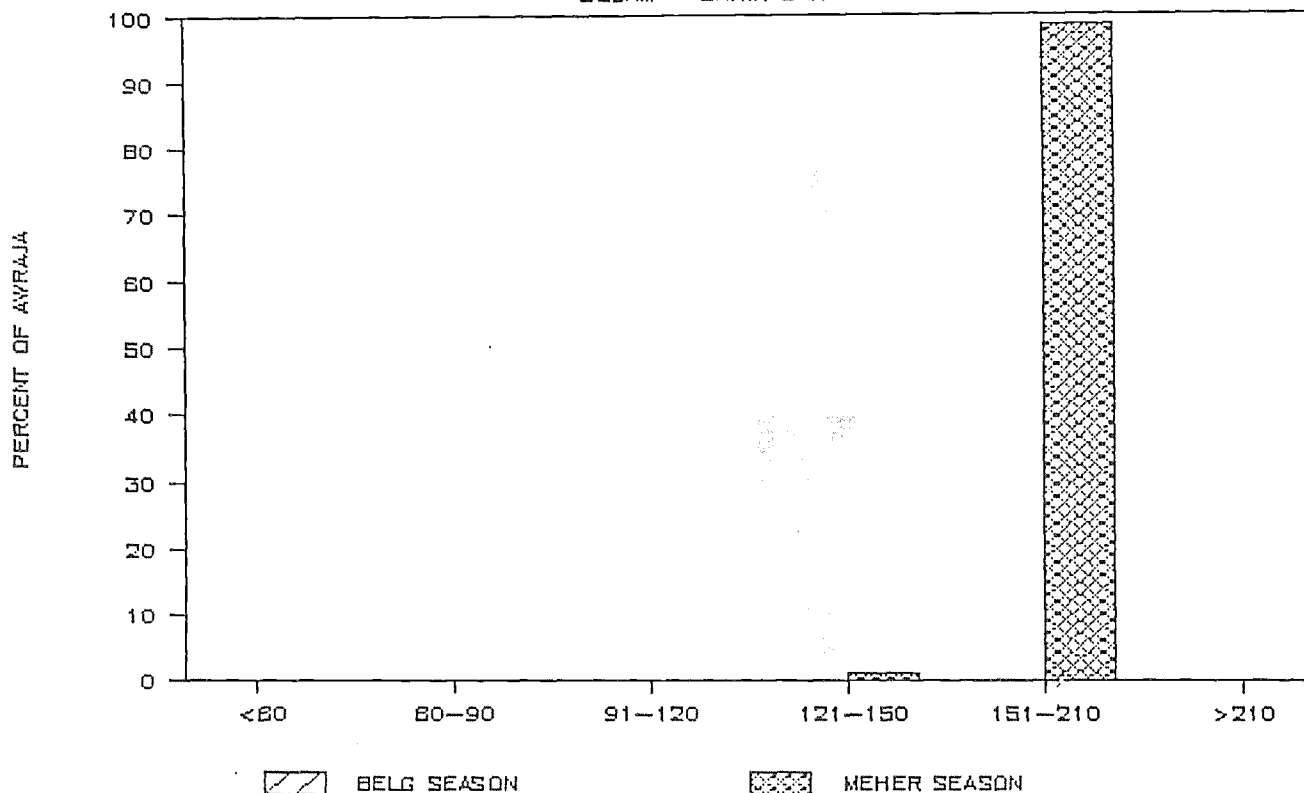
DEPENDABLE GROWING PERIOD — DAYS

GAMO GOFA — GOFA



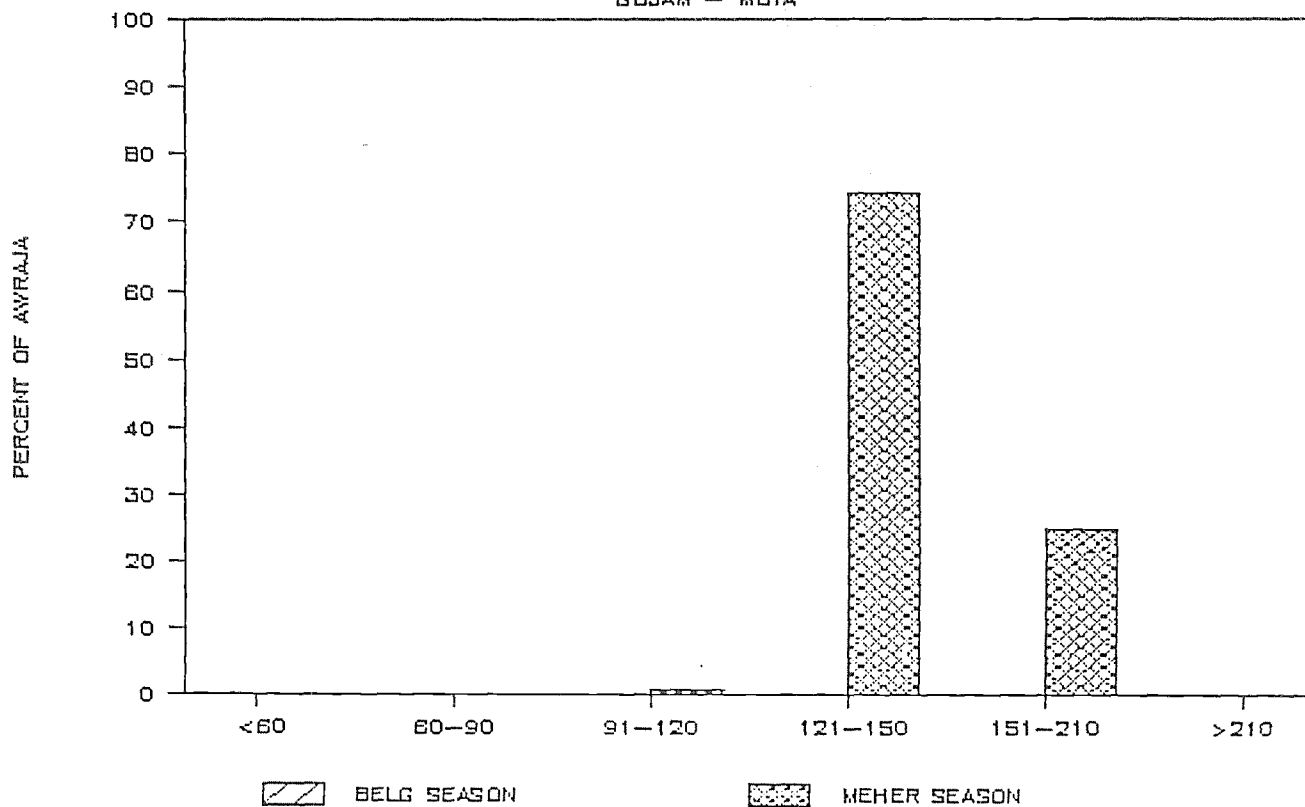
DEPENDABLE GROWING PERIOD — DAYS

GOJAM — BAHIR DAR



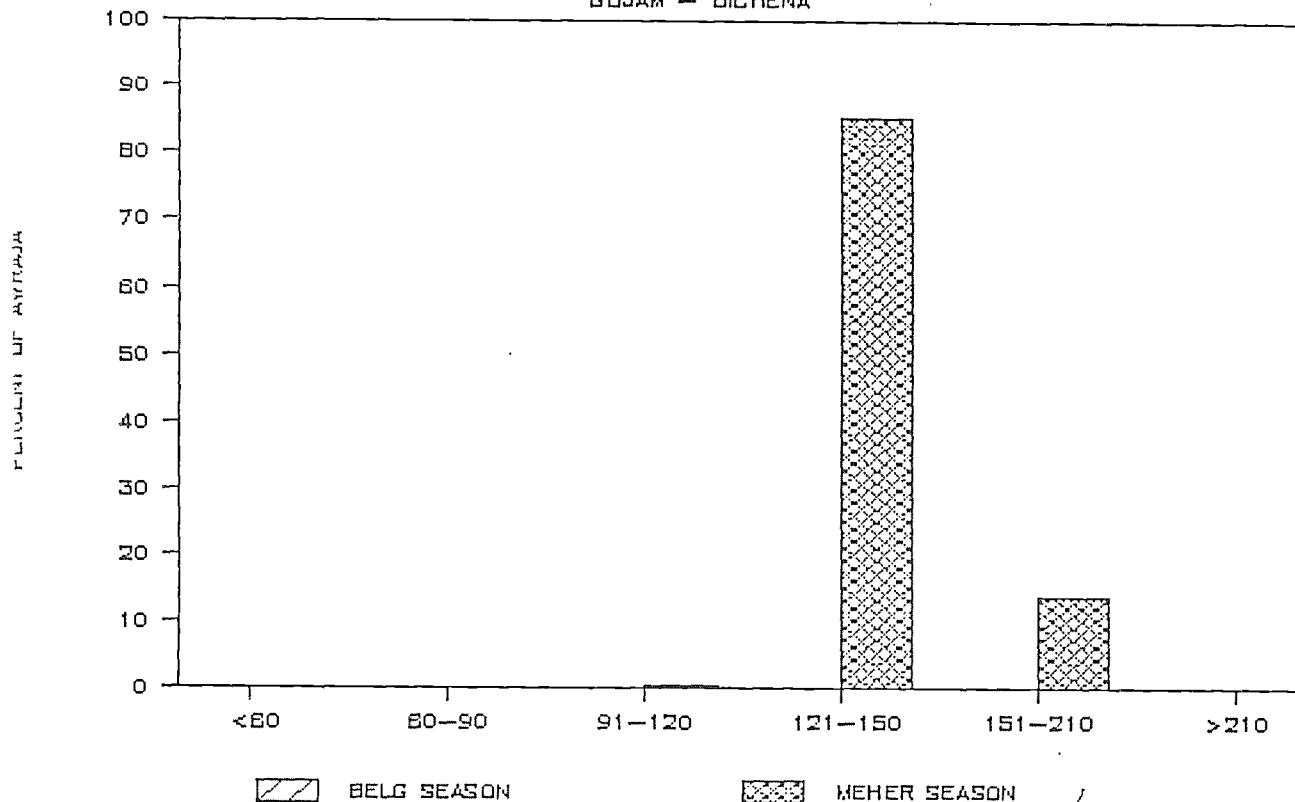
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GOJAM — MOTA



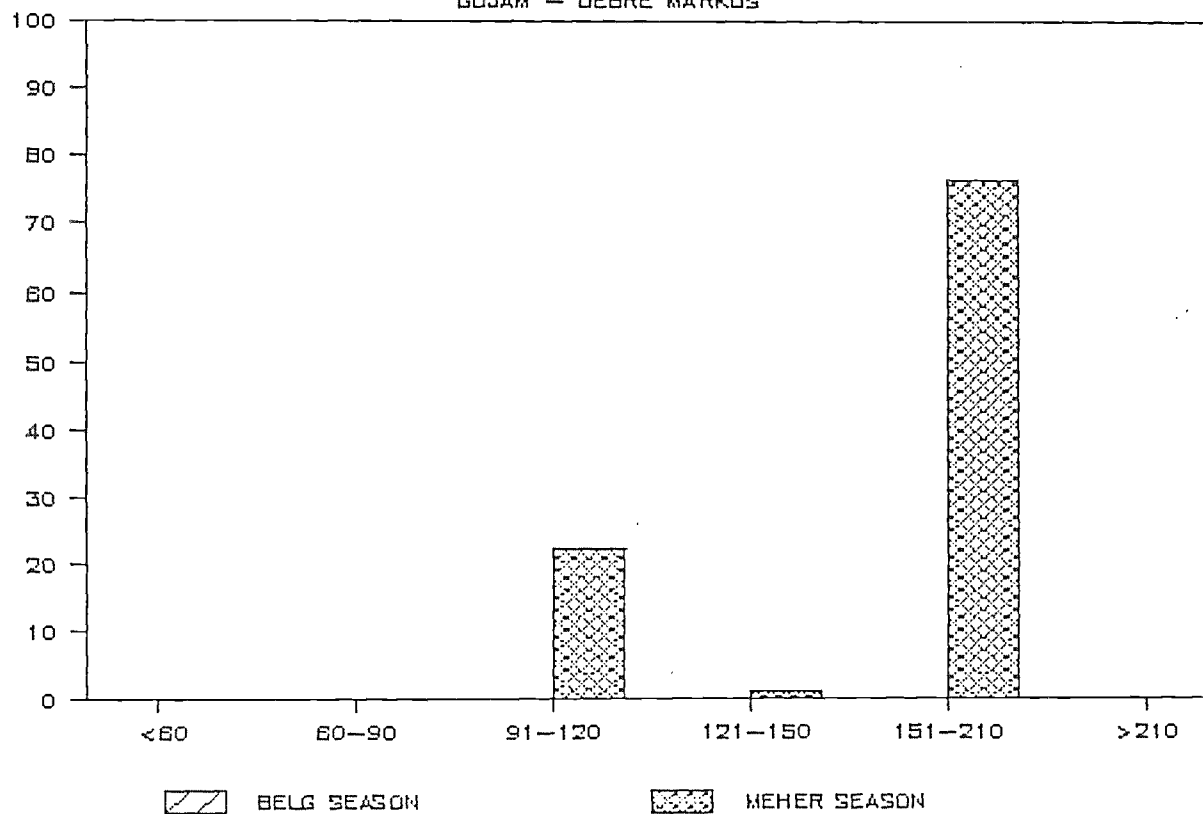
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GOJAM - BICHENA



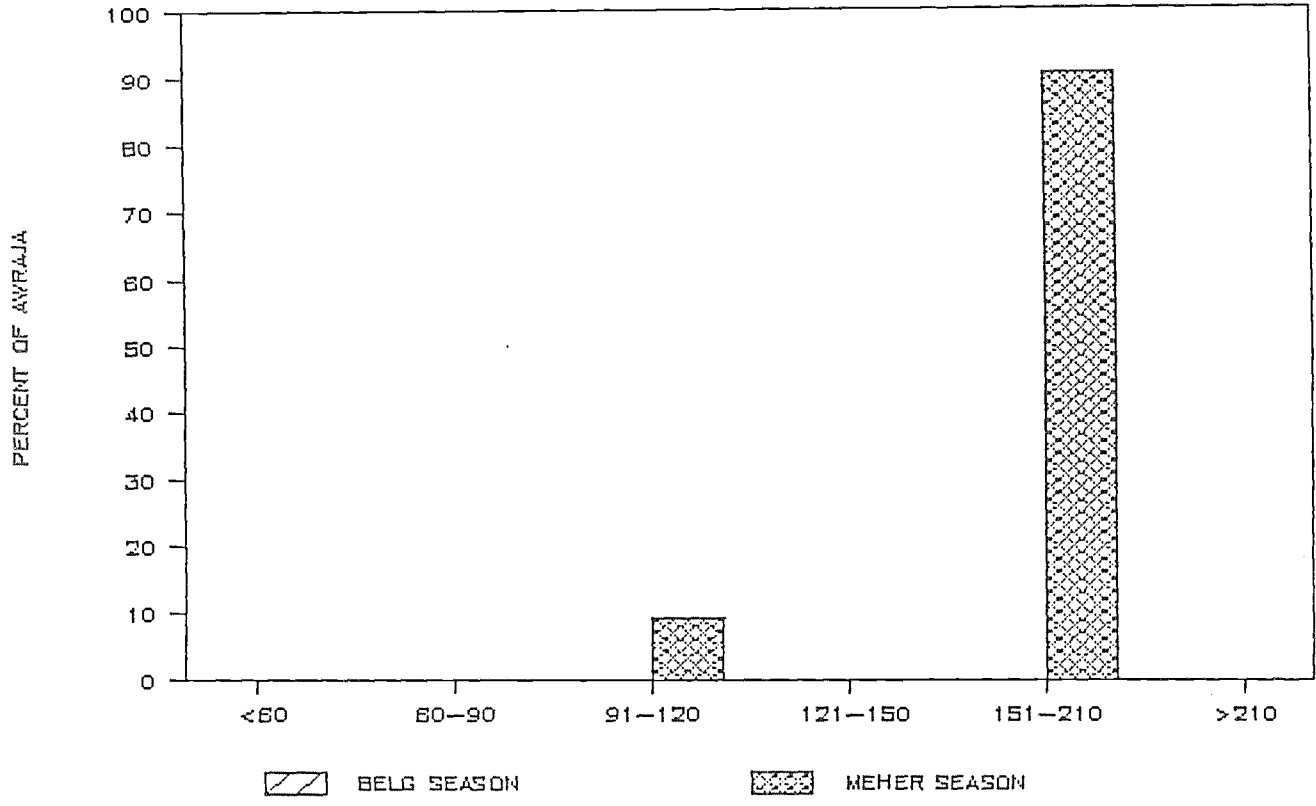
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GOJAM - DEBRE MARKOS



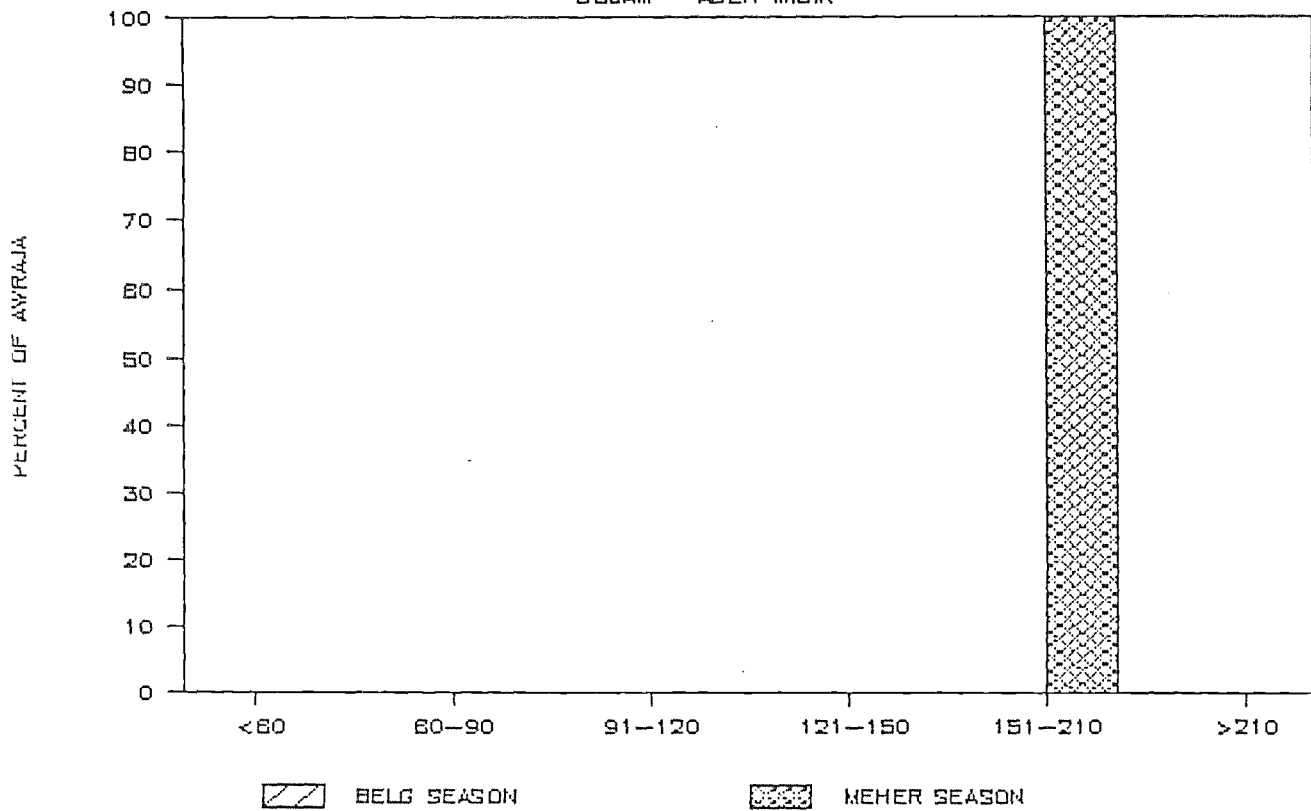
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GOJAM - KOLA DEGA DAMOT



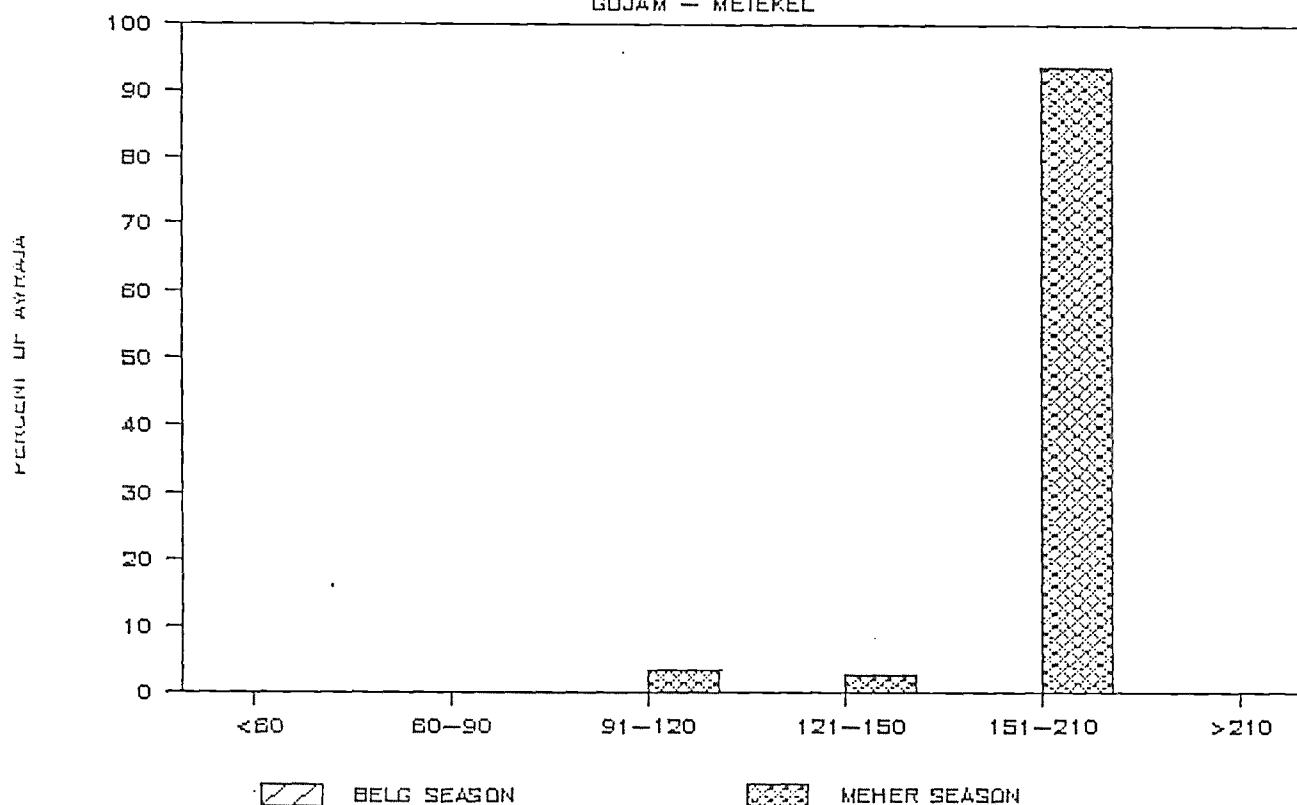
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GOJAM - AGEW MIDIR



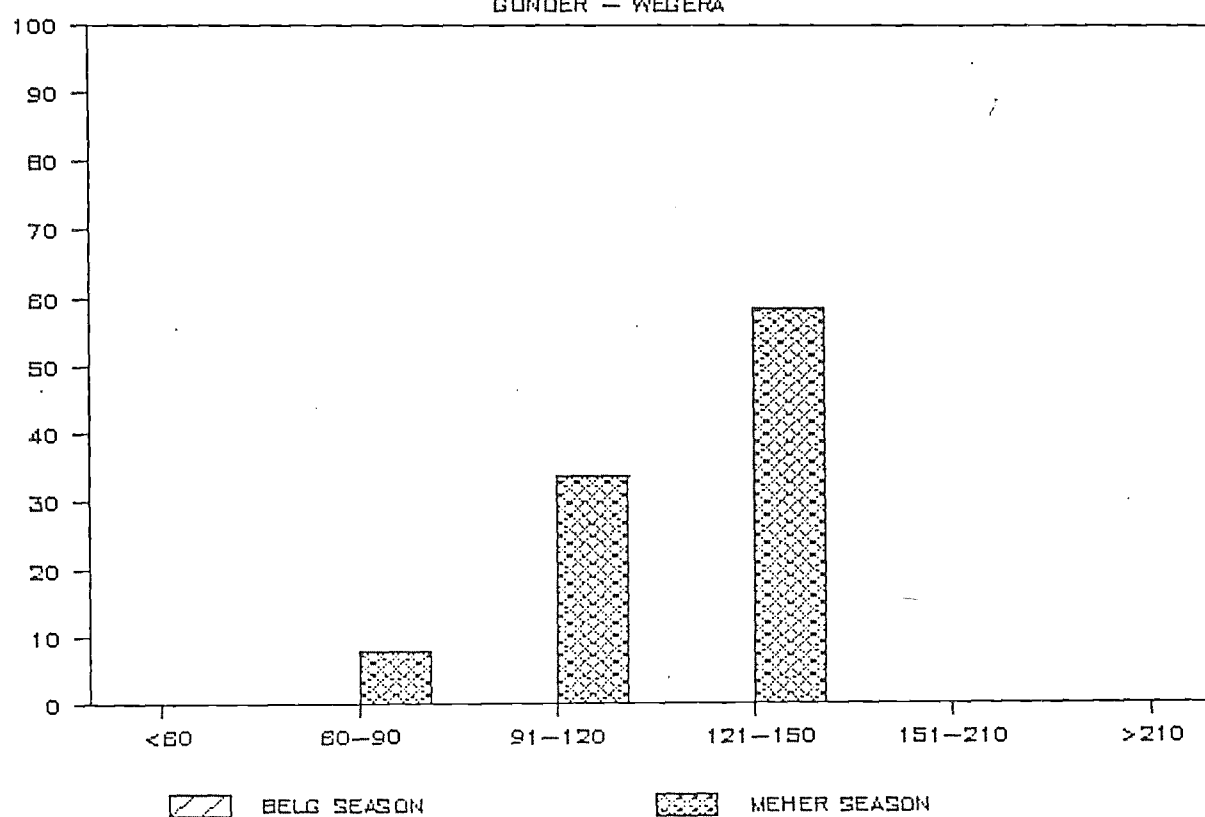
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GOJAM - METEKEL



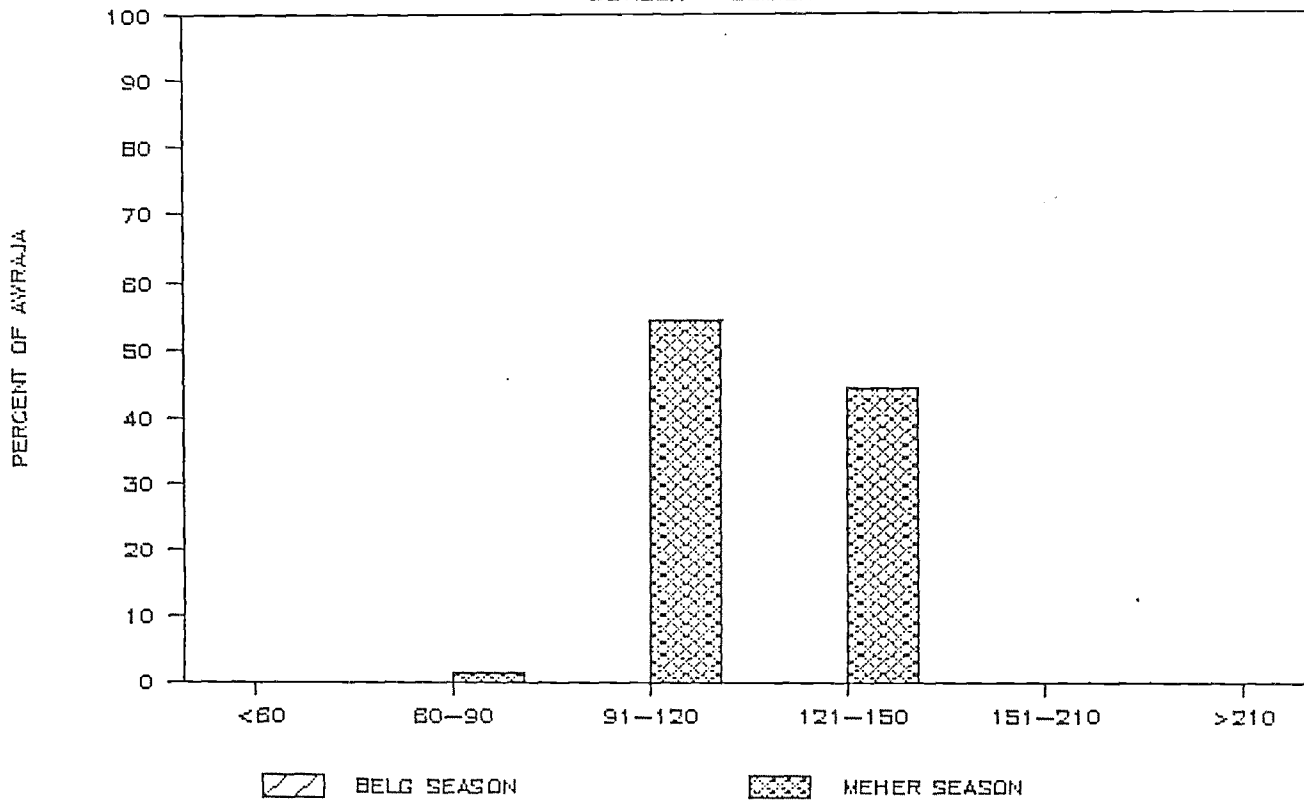
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GONDER - WEGERA



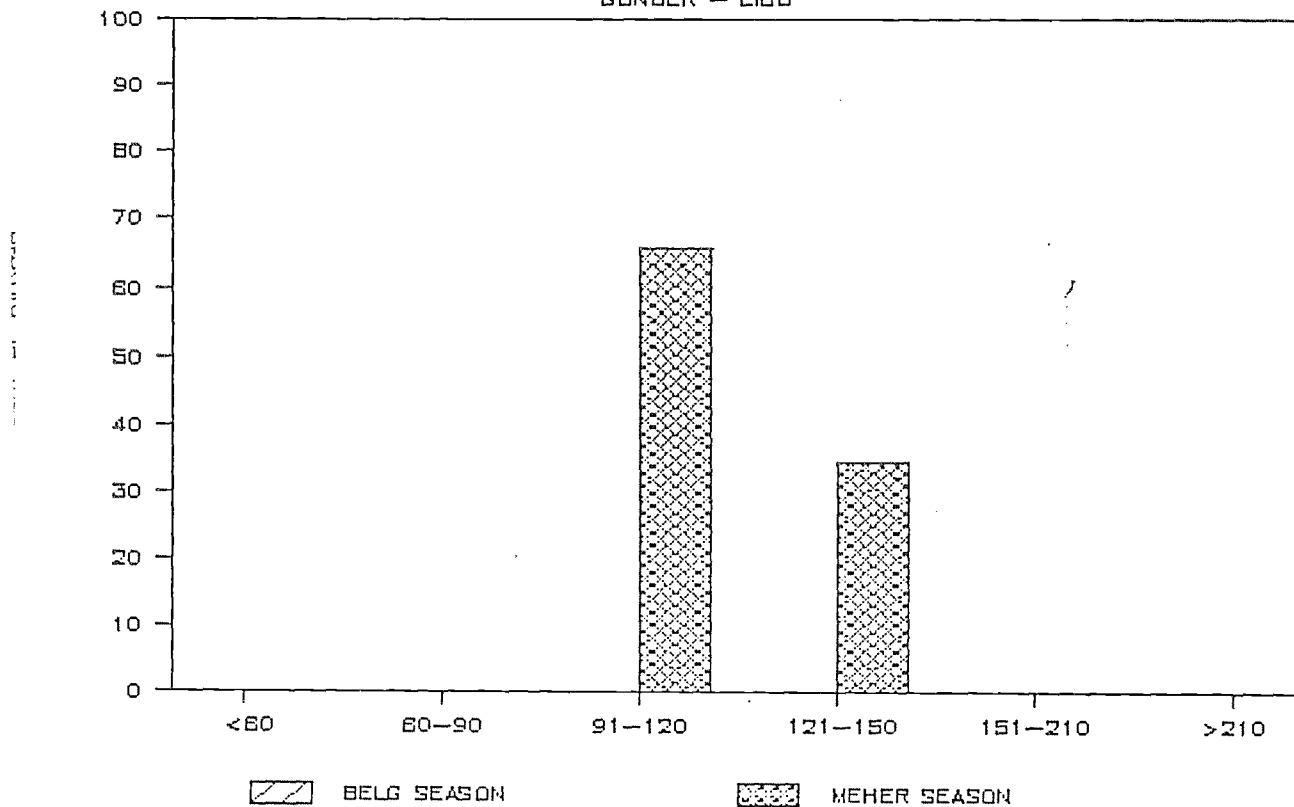
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GONDER - SEMIEN



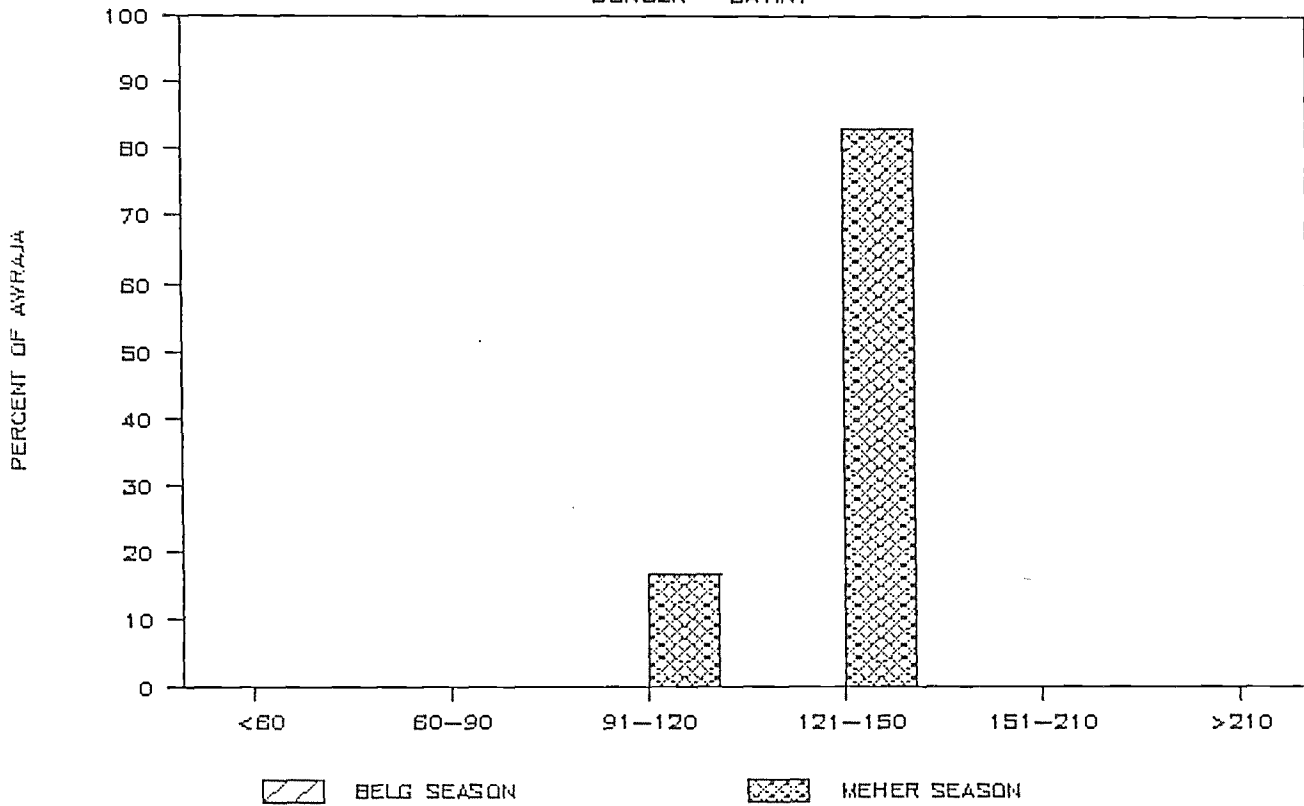
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GONDER - LIBO



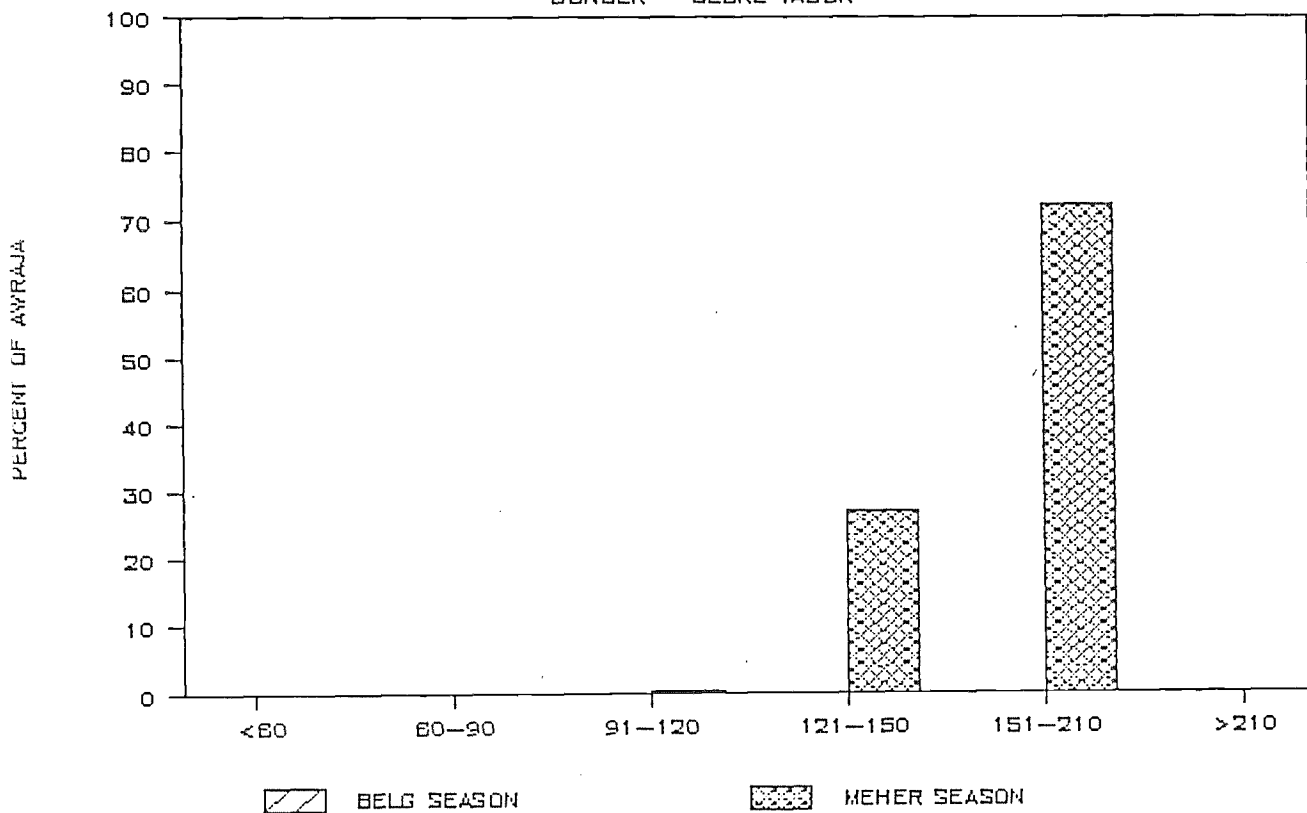
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GONDER — GAYINT



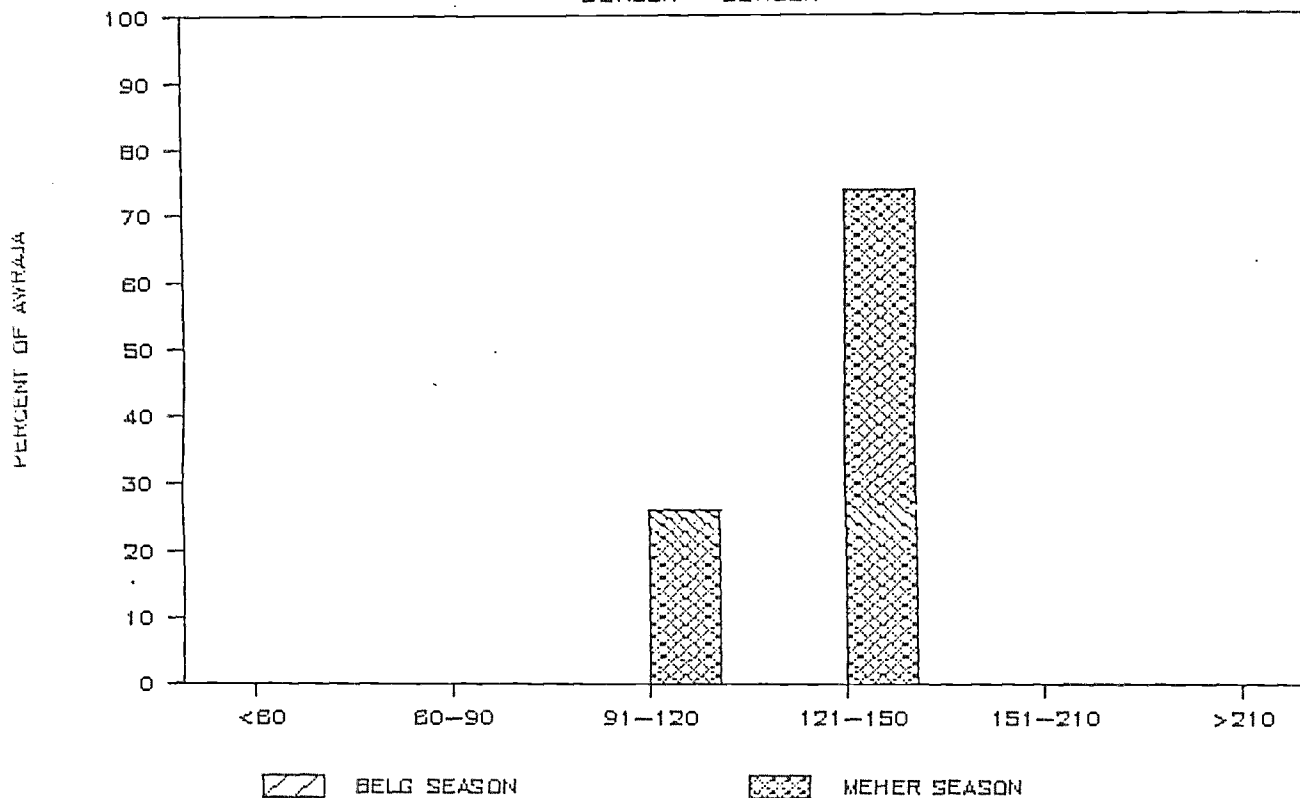
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GONDER — DEBRE TABOR



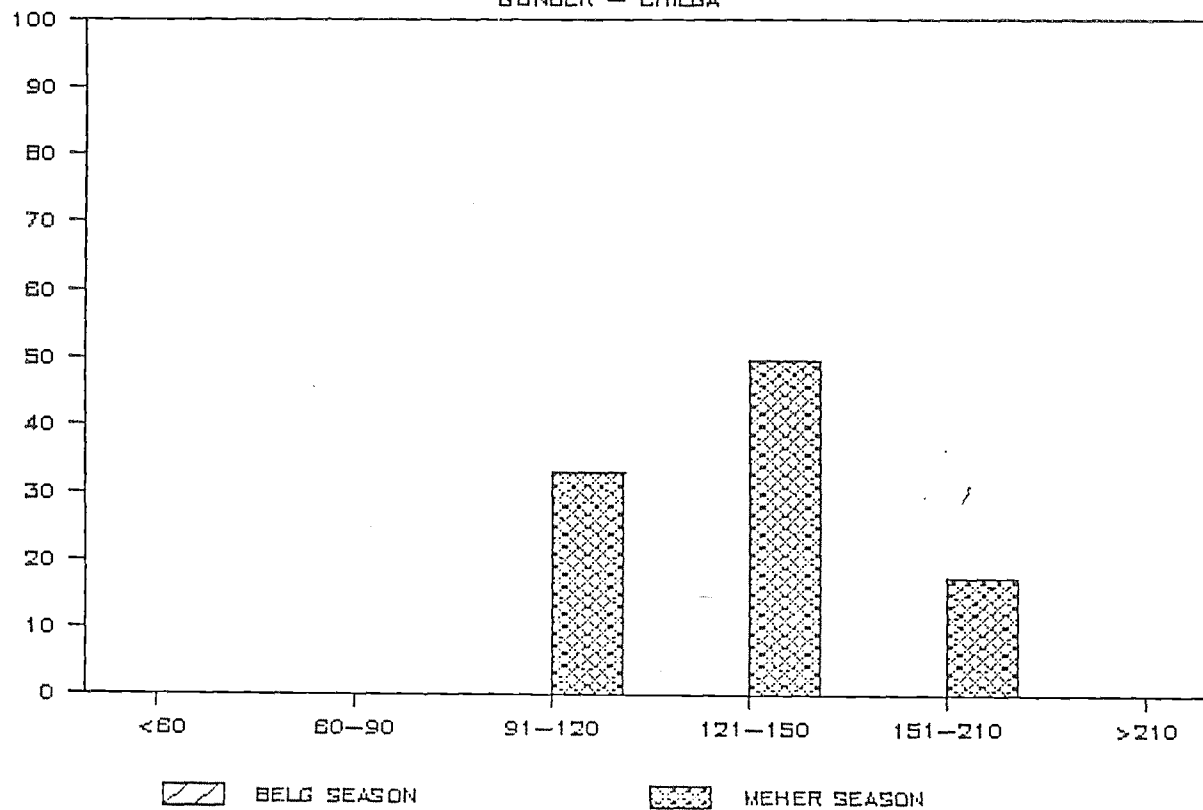
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GONDER - GONDER



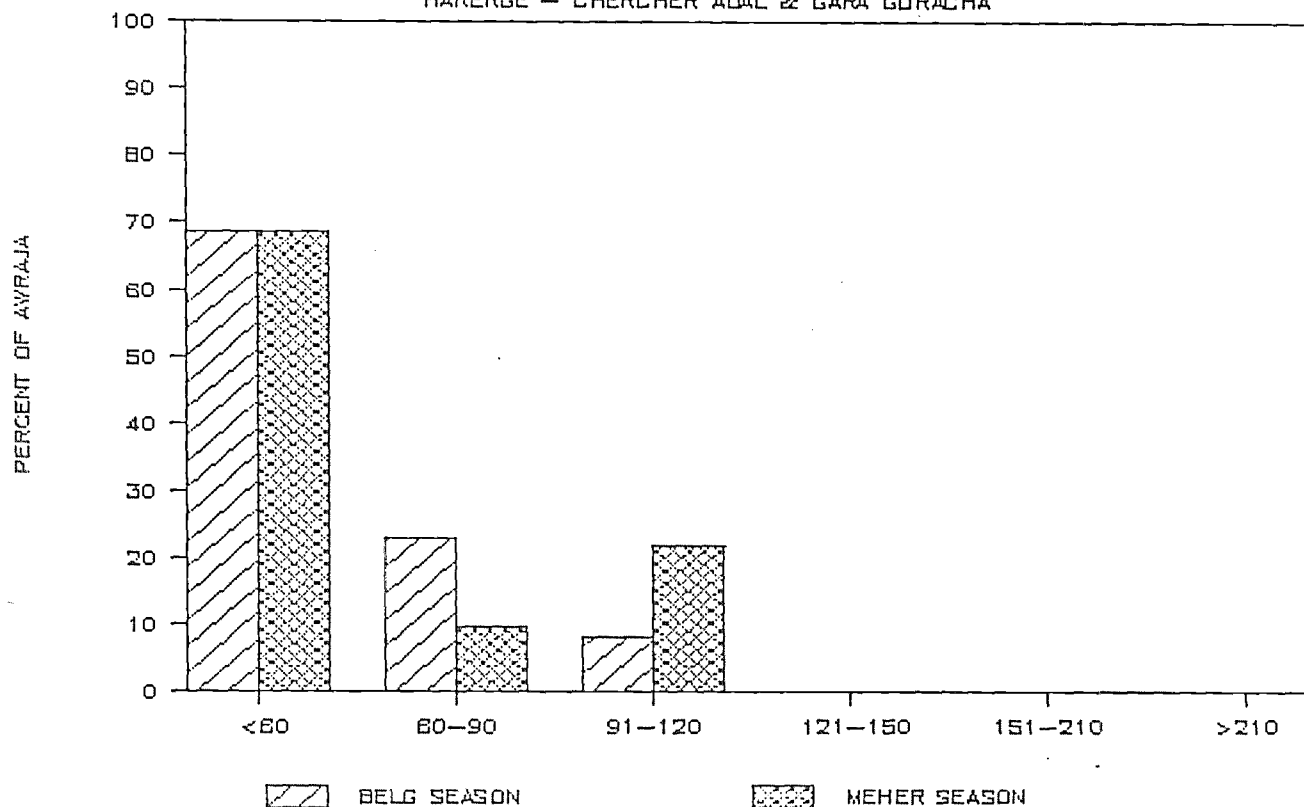
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GONDER - CHILGA



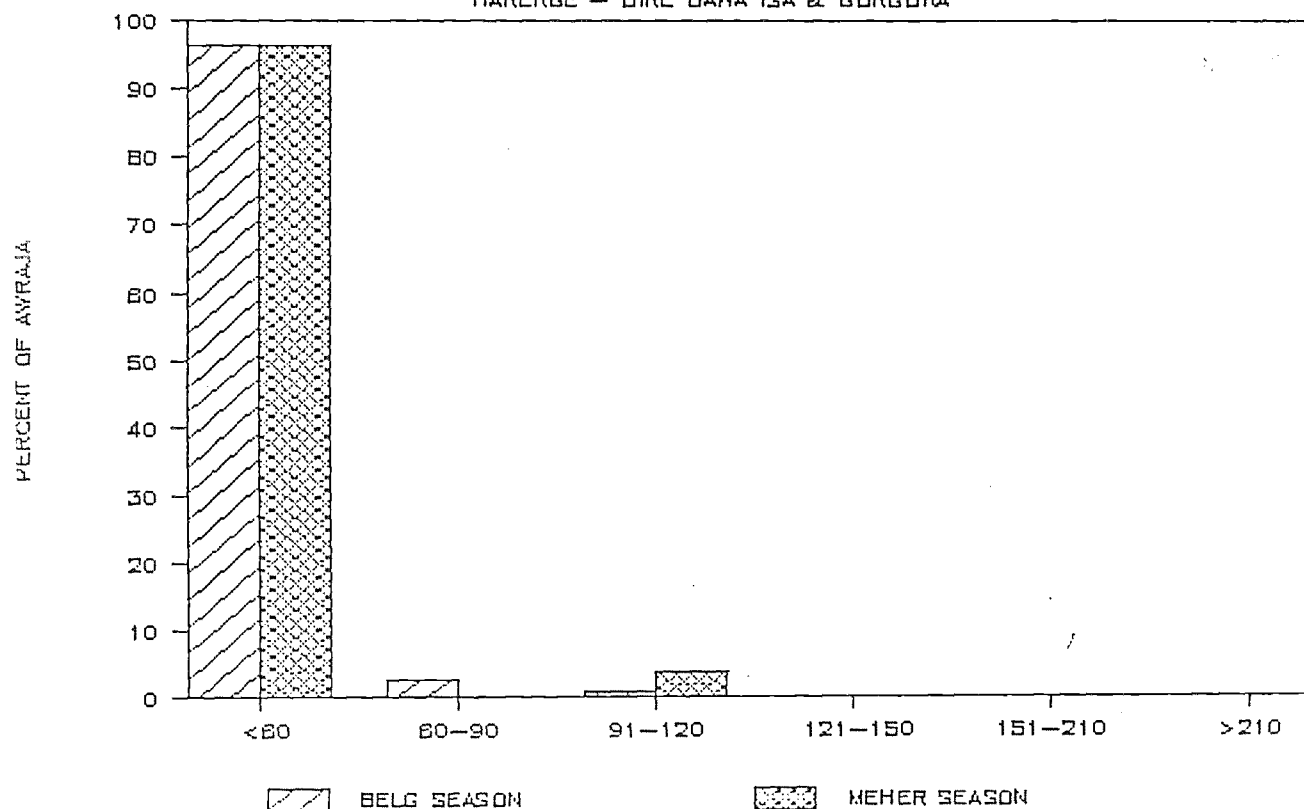
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HARERGE - CHERCHER ADAL & GARA GURACHA



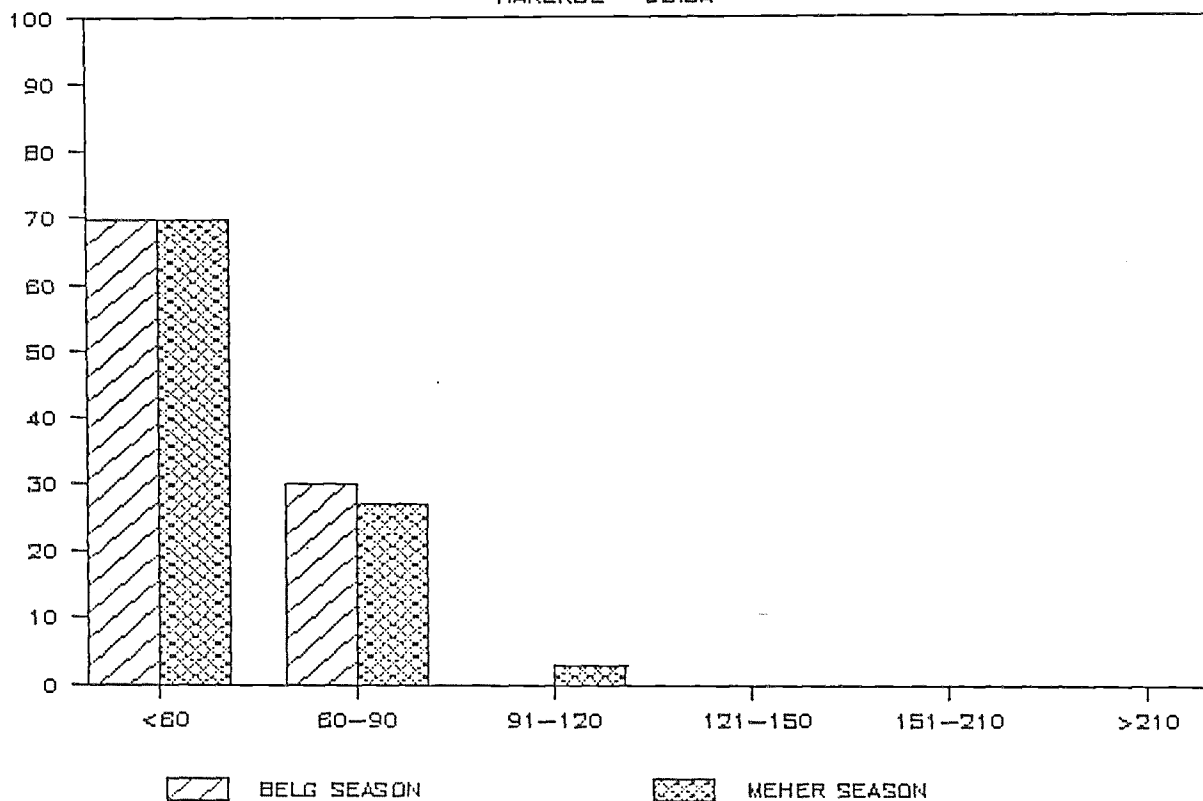
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HARERGE - DIRE DAWA ISA & GURGURA



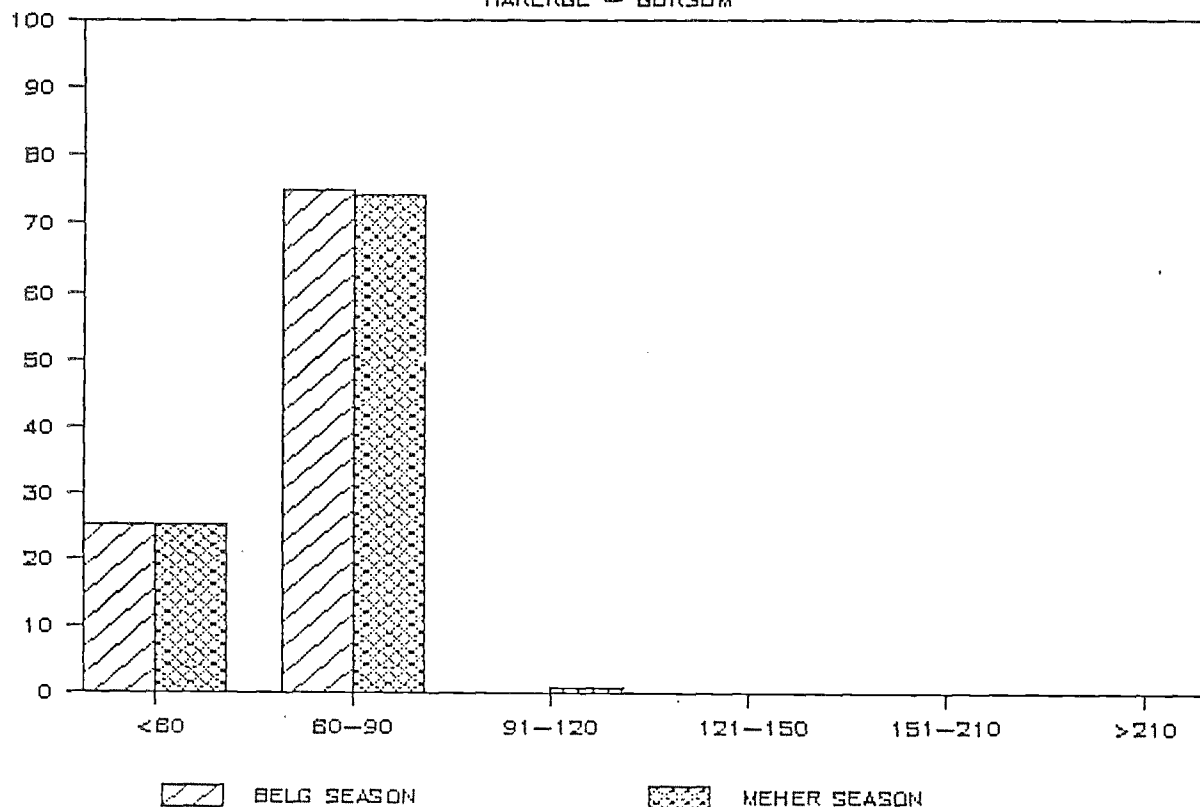
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HARERGE — JUIGA



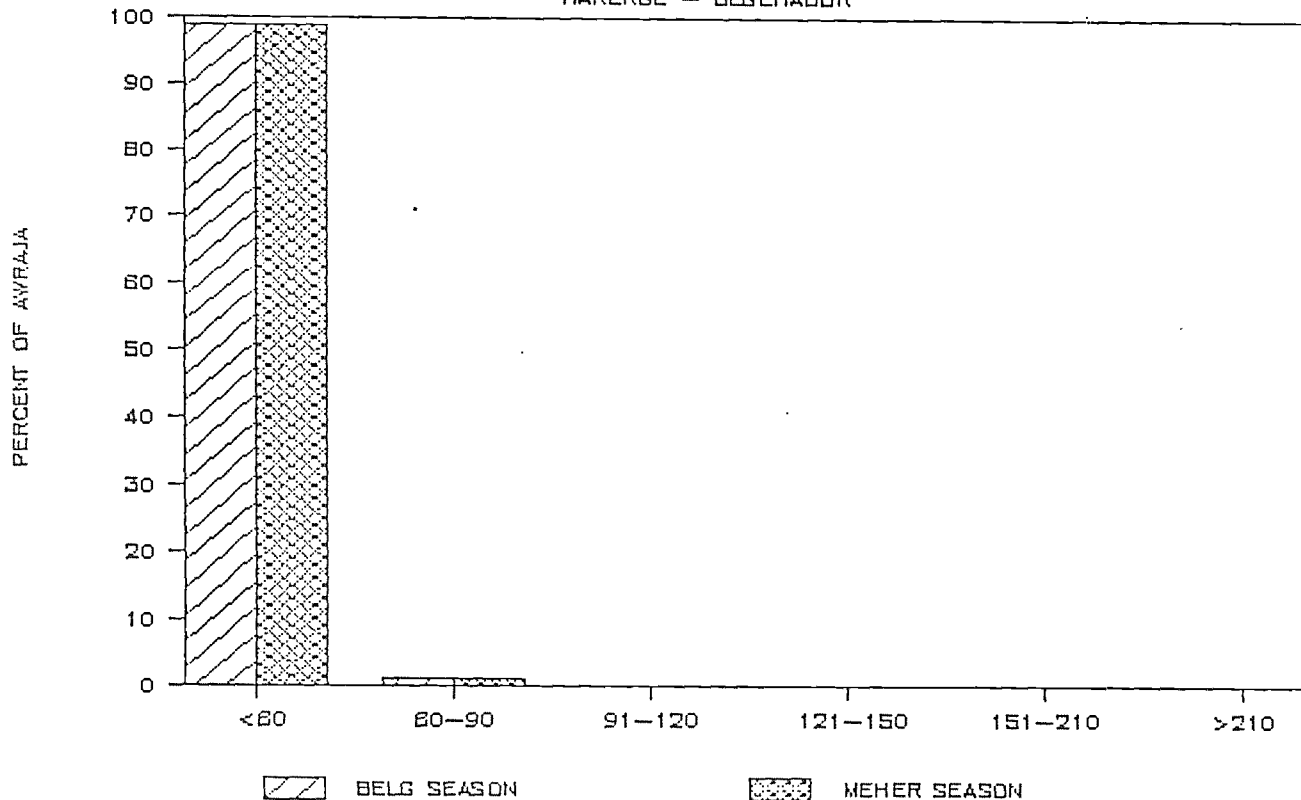
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HARERGE — GURSUM



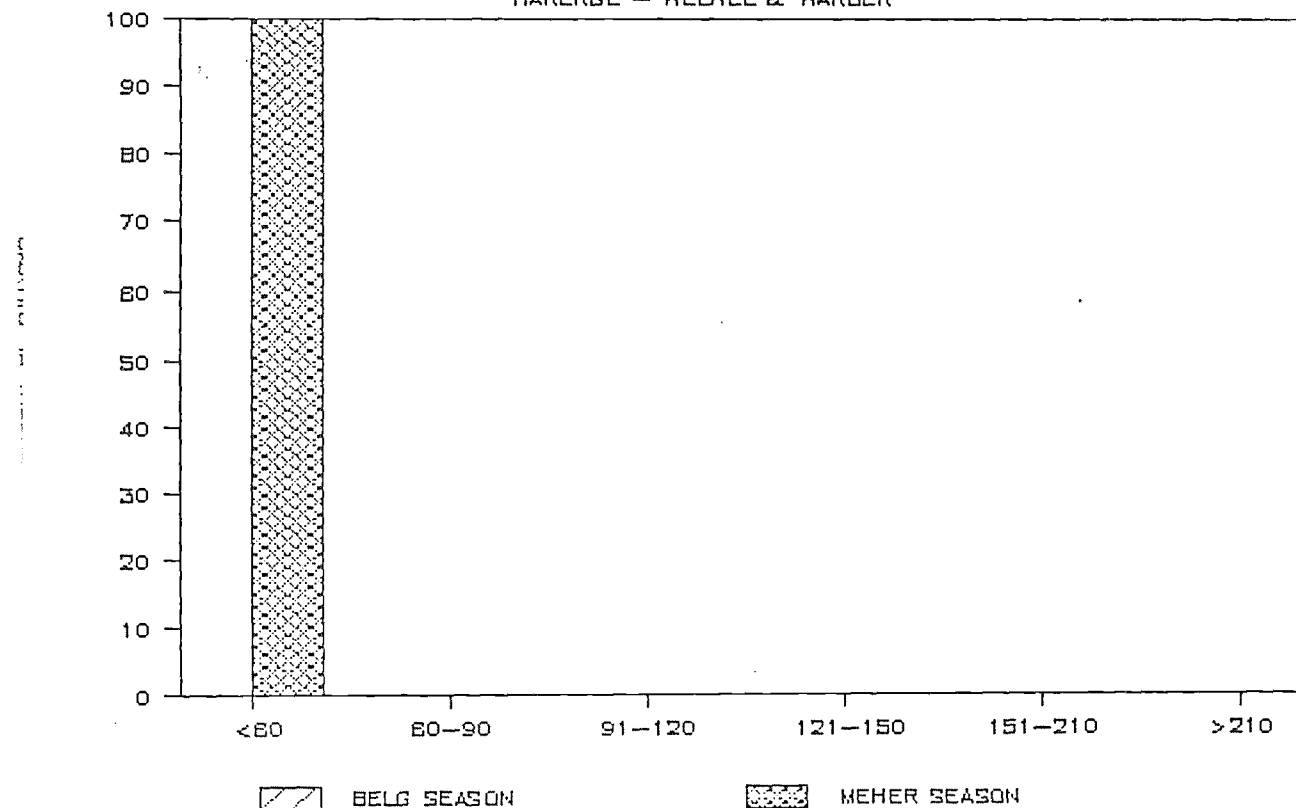
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HARERGE - DEGEHABUR



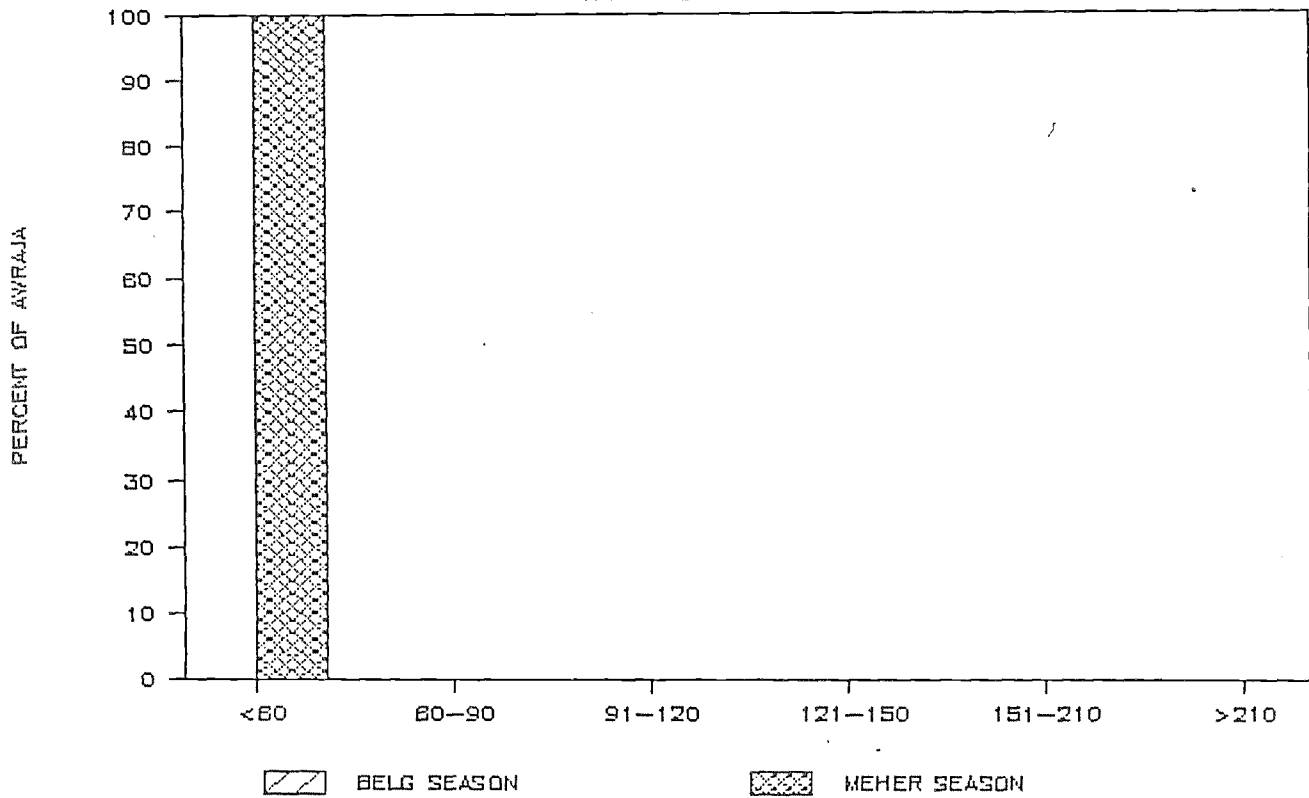
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HARERGE - WELWEL & WARDER



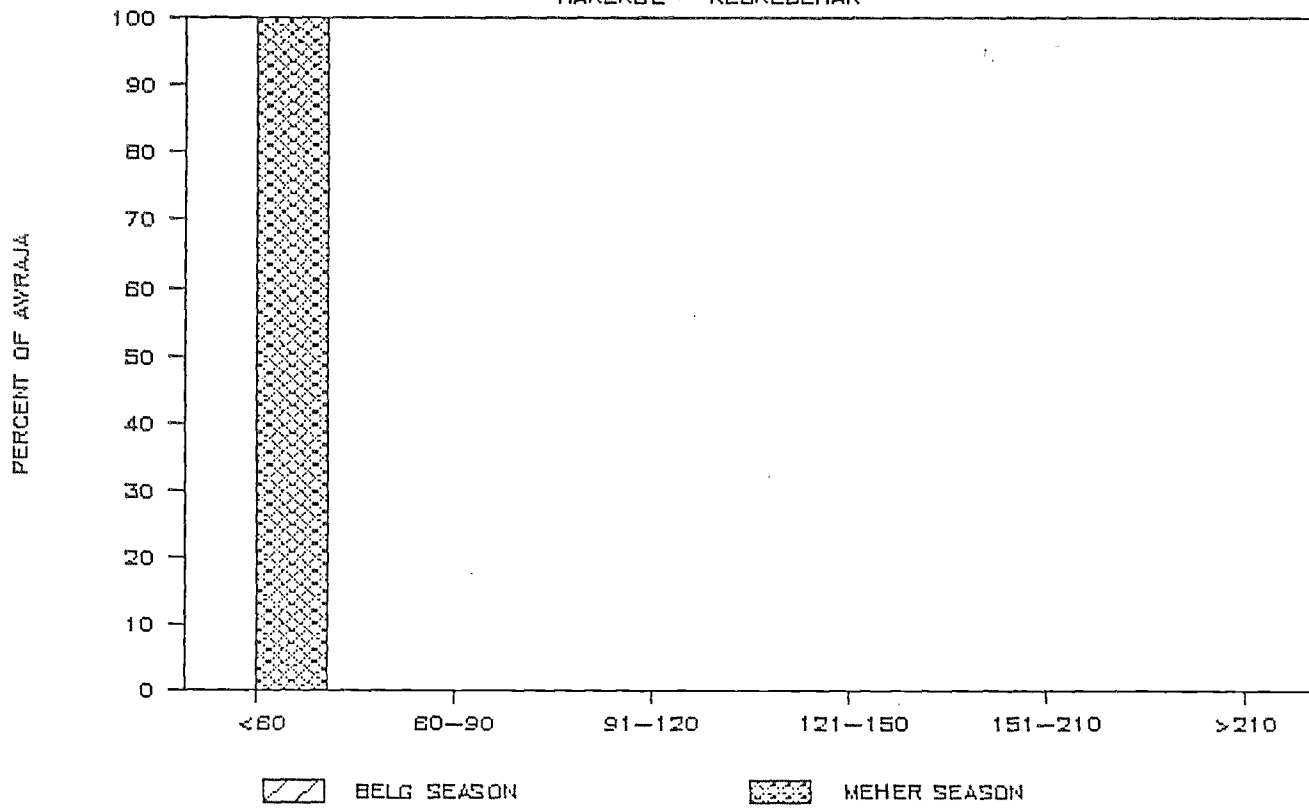
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HARERGE - KELAFO



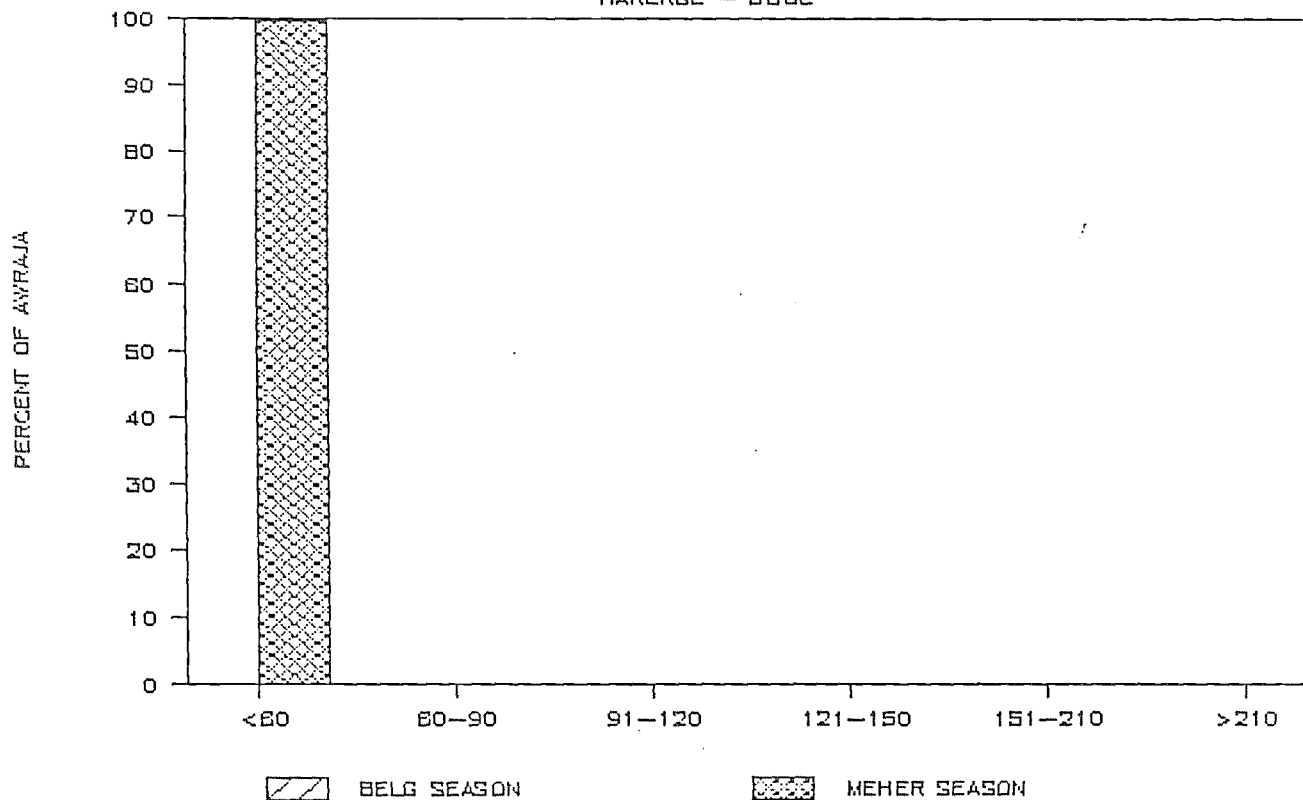
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HARERGE - KEBREDEHAR



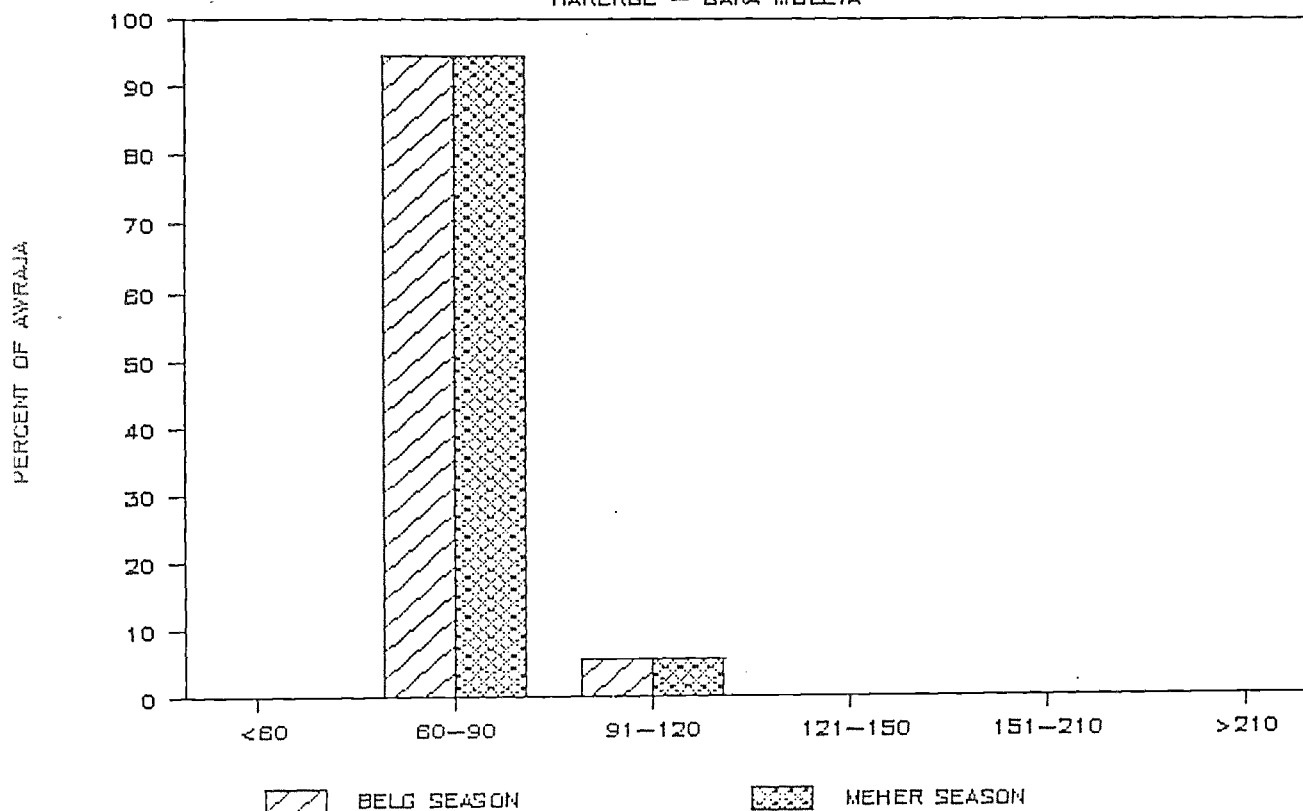
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HARERGE — GODE



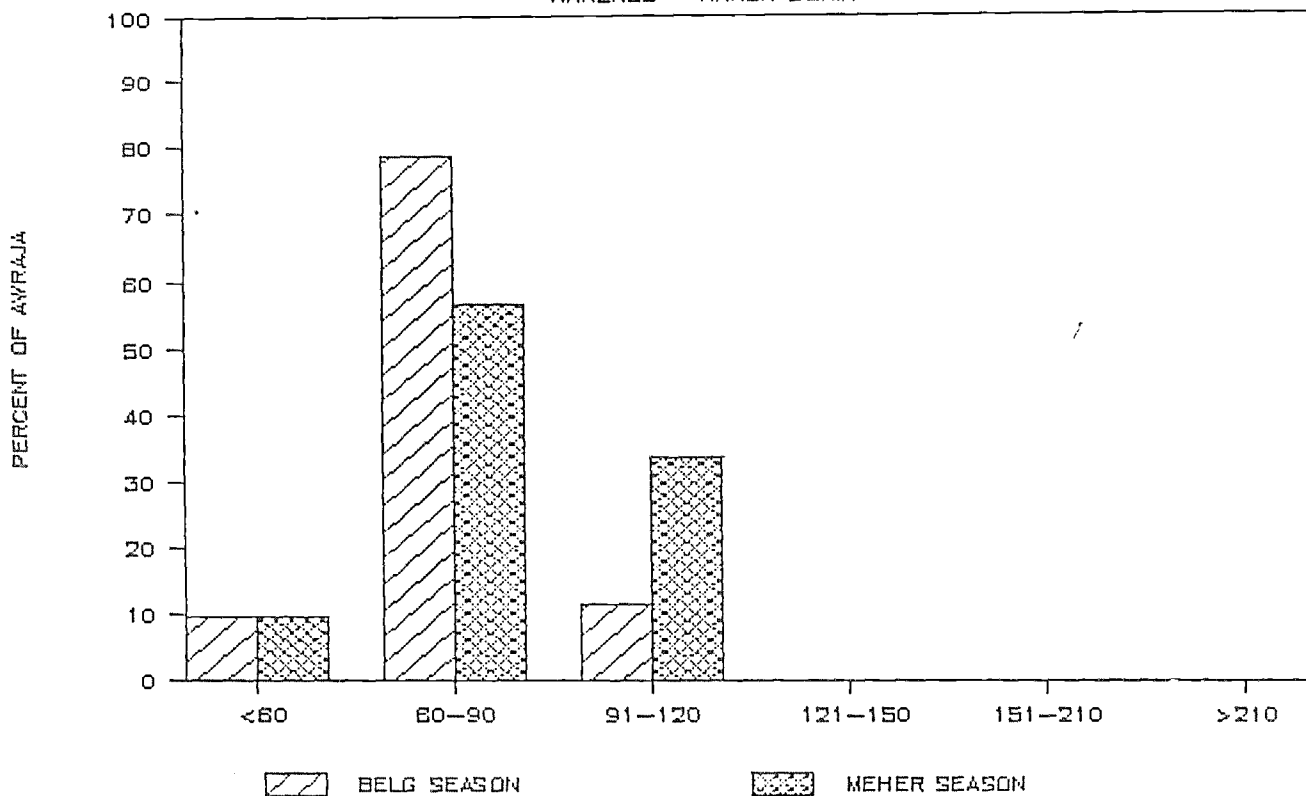
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HARERGE — GARA MULETA



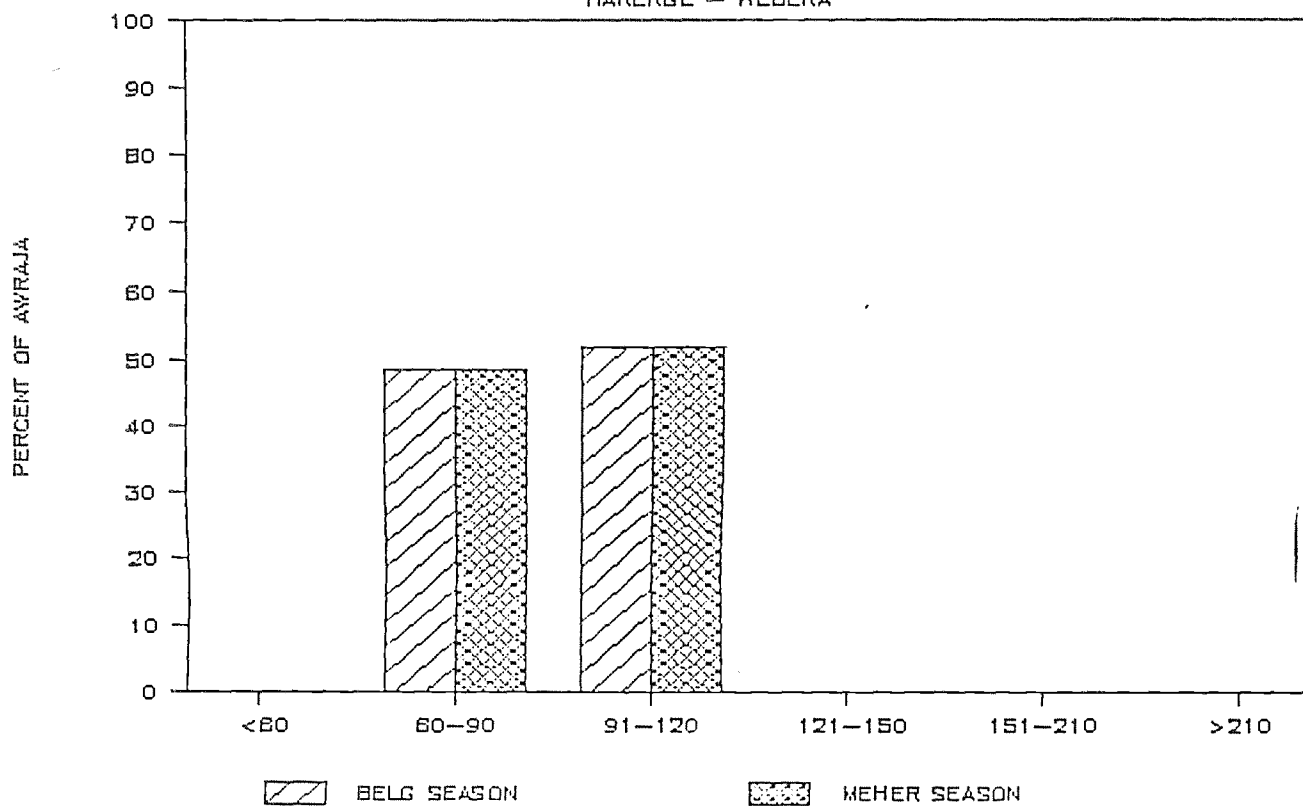
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HARERGE - HARER ZURIA



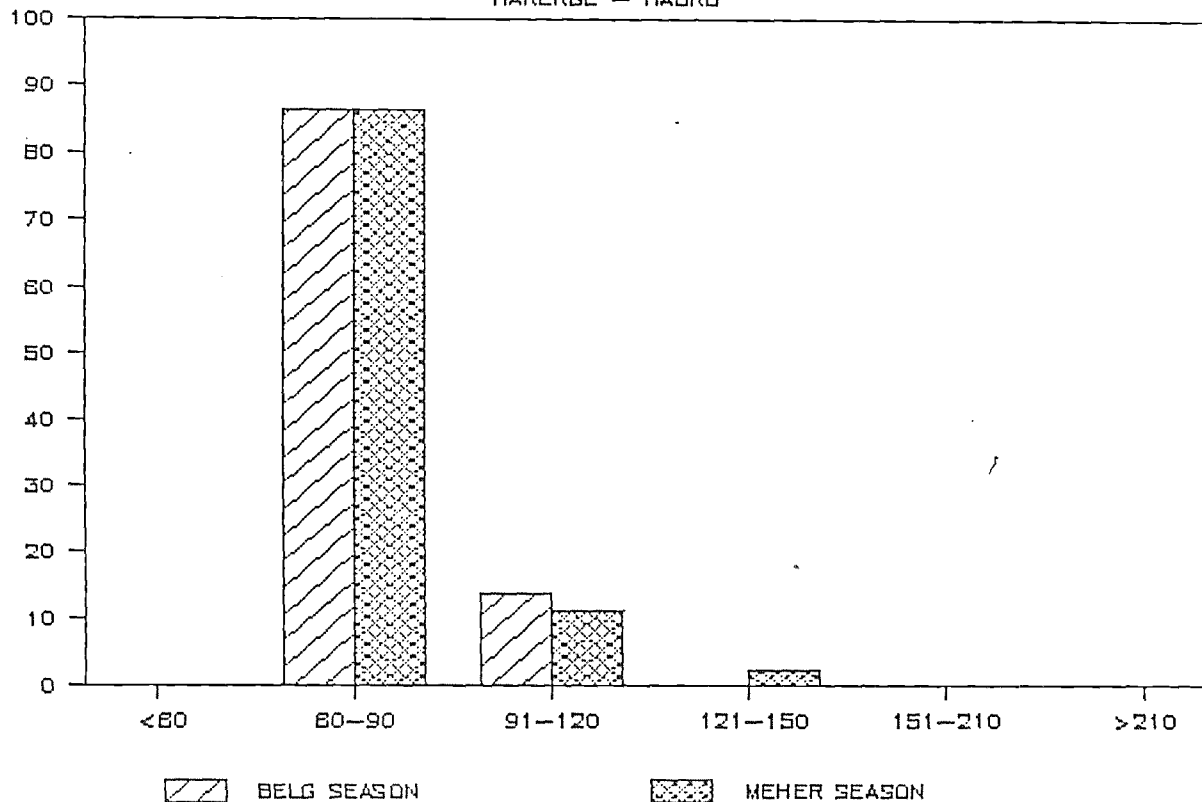
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HARERGE - WEBERA



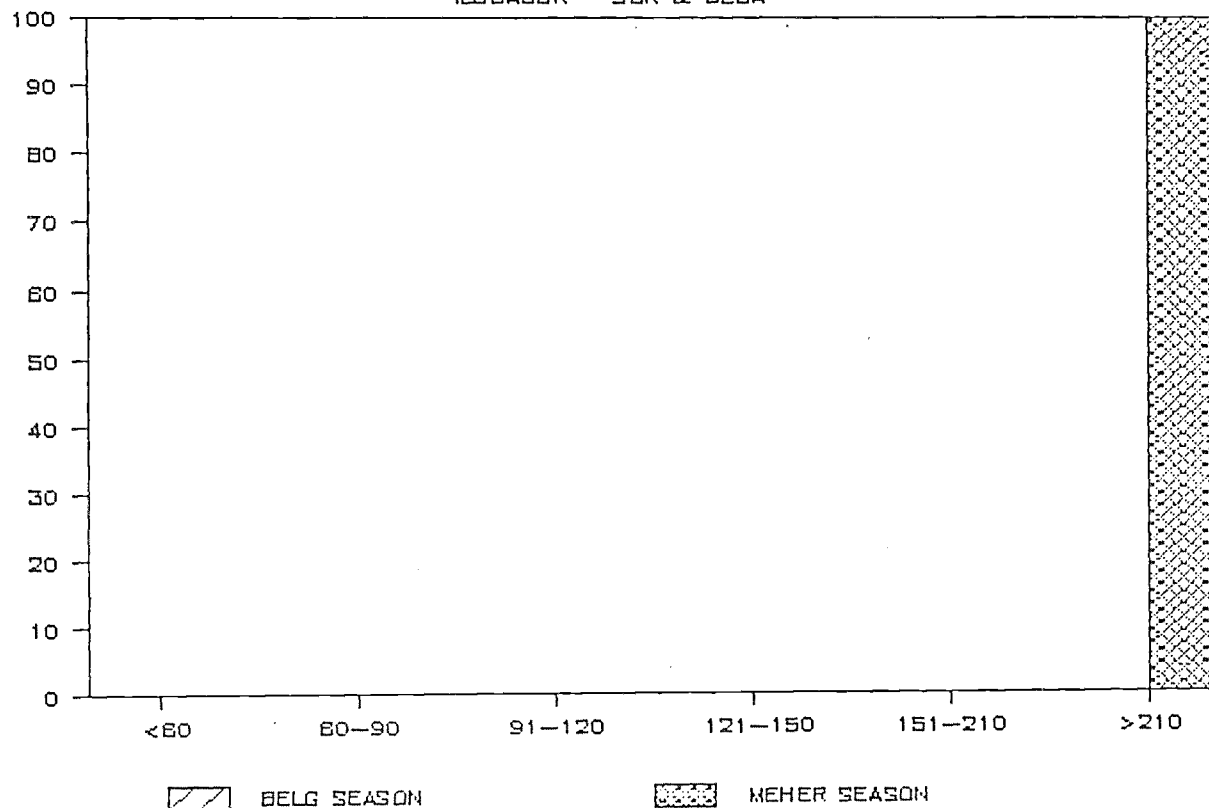
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HARERGE - HABRO



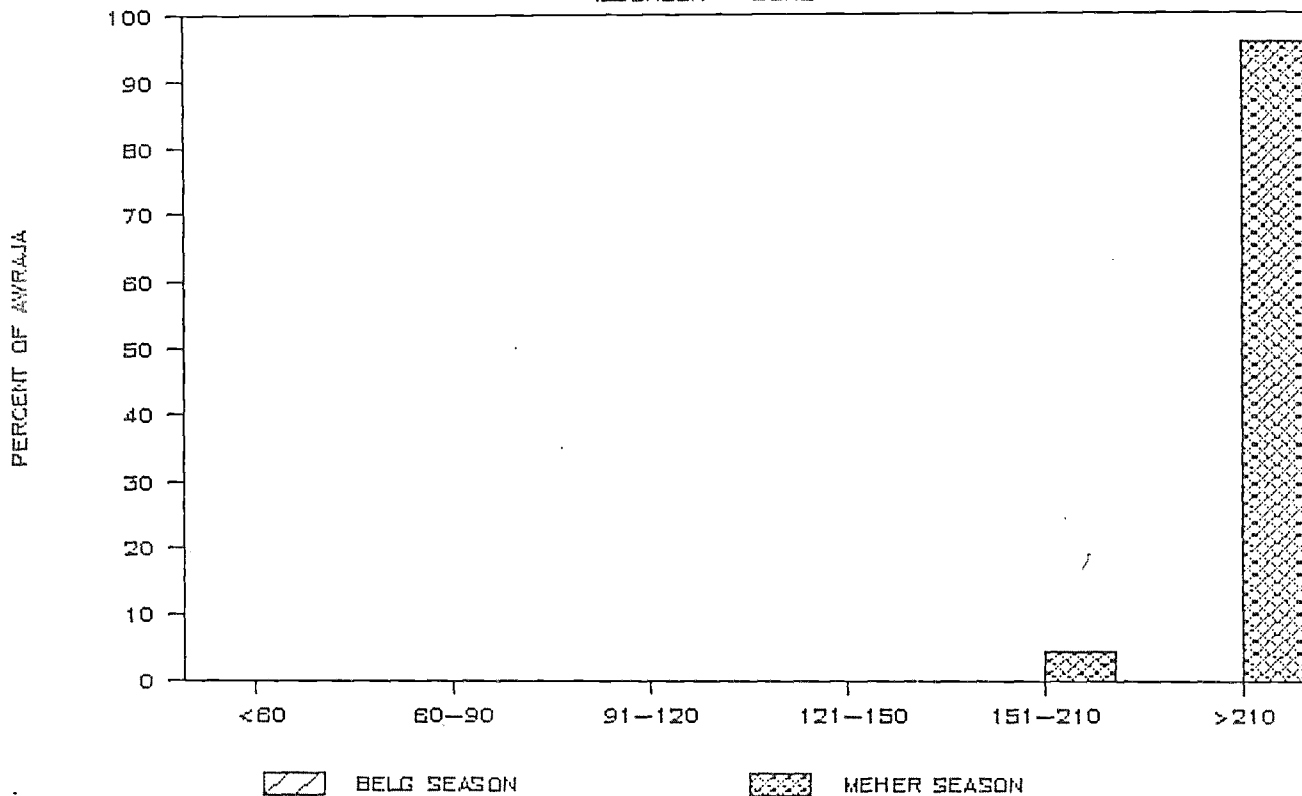
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ILLUBABOR - SOR & GEBE



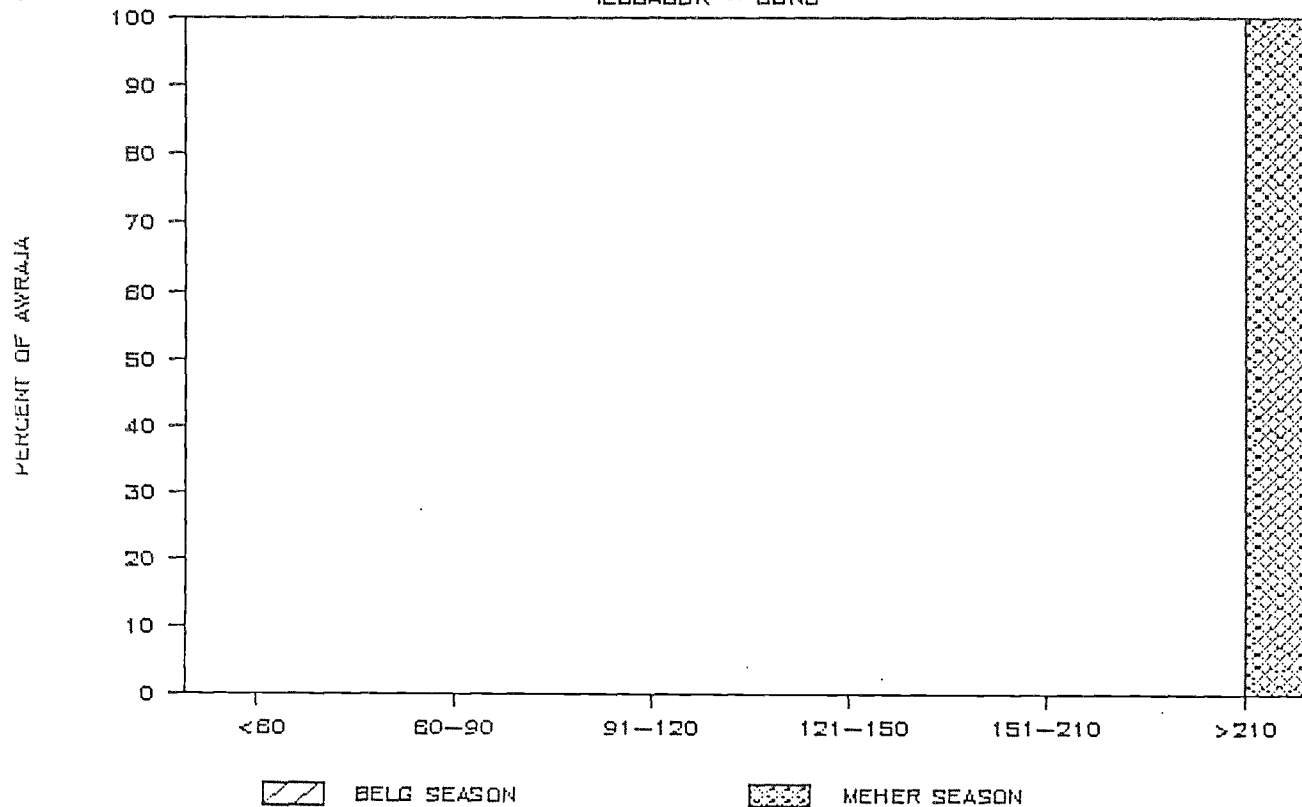
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ILUBABOR — GORE



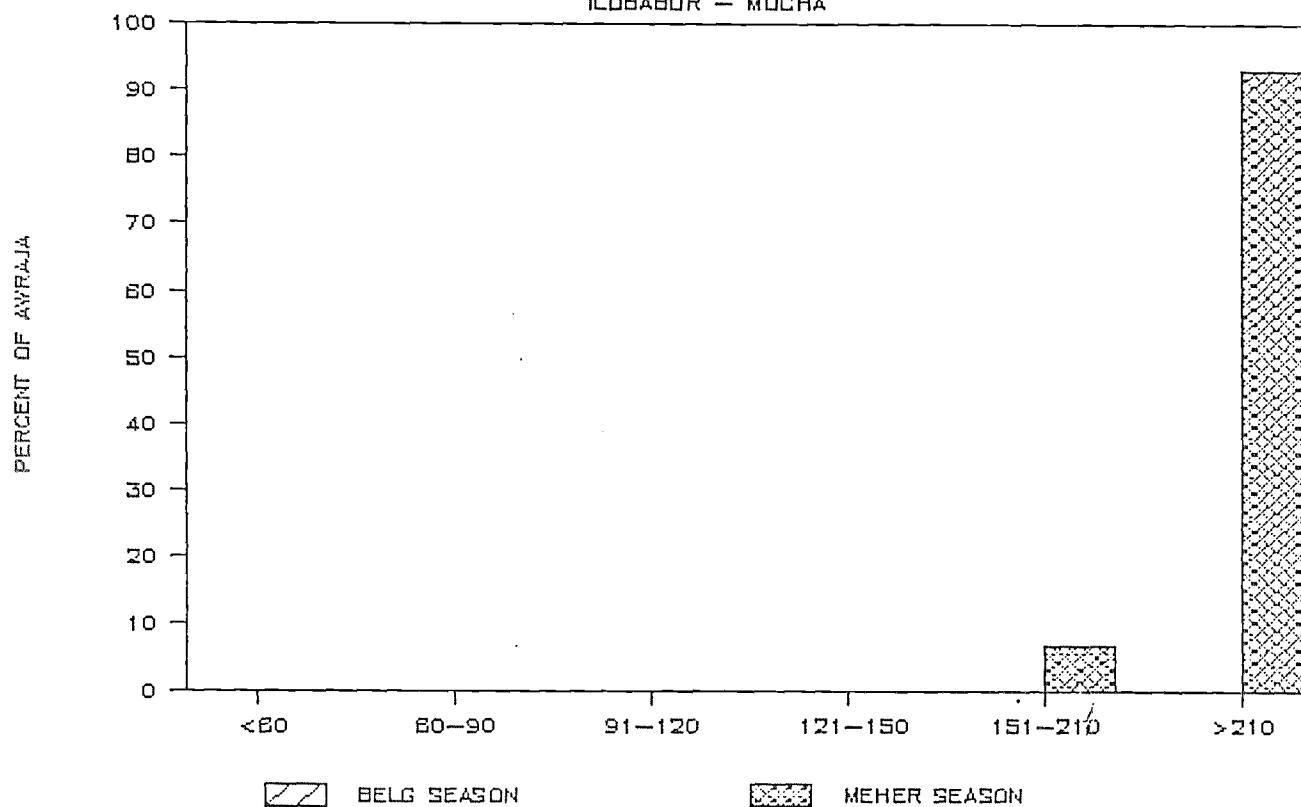
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ILUBABOR — BUND



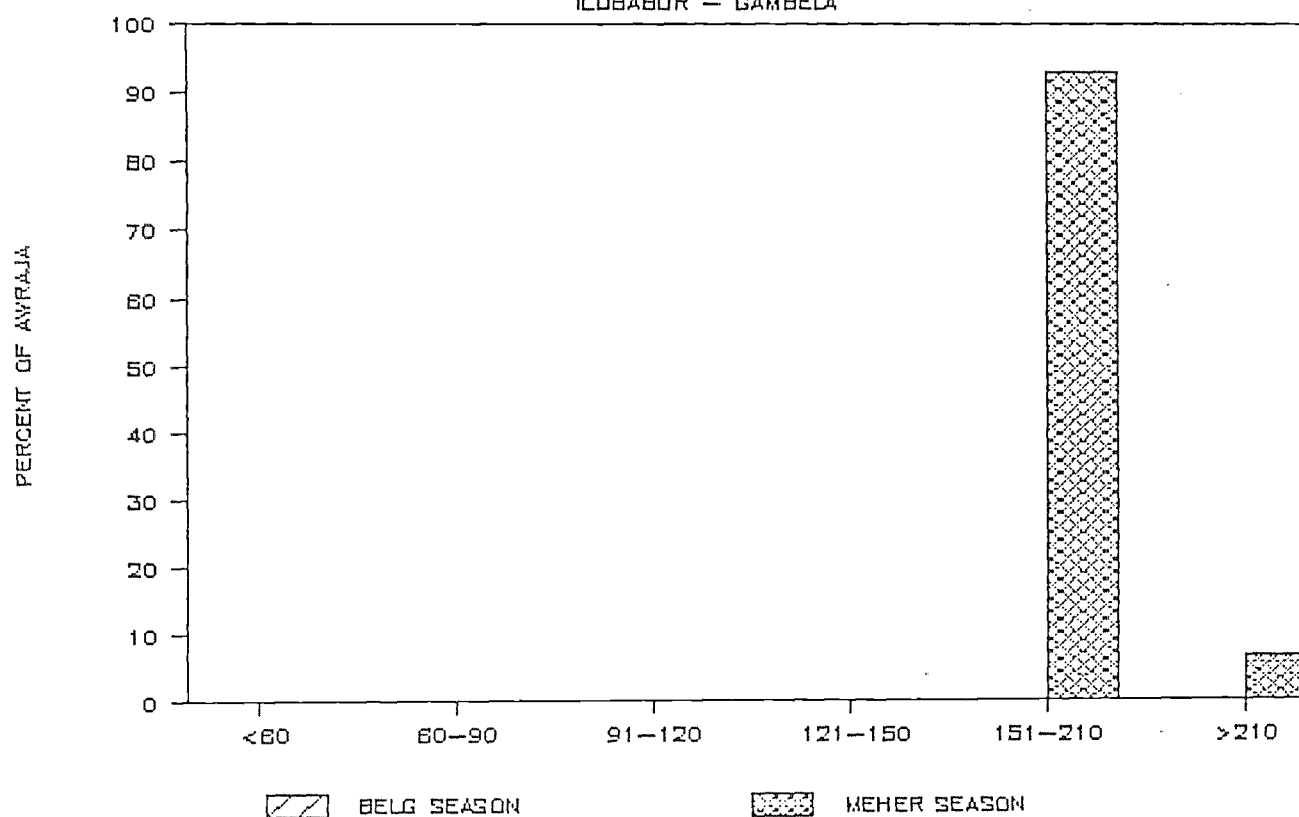
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ILUBABOR — MOCHA



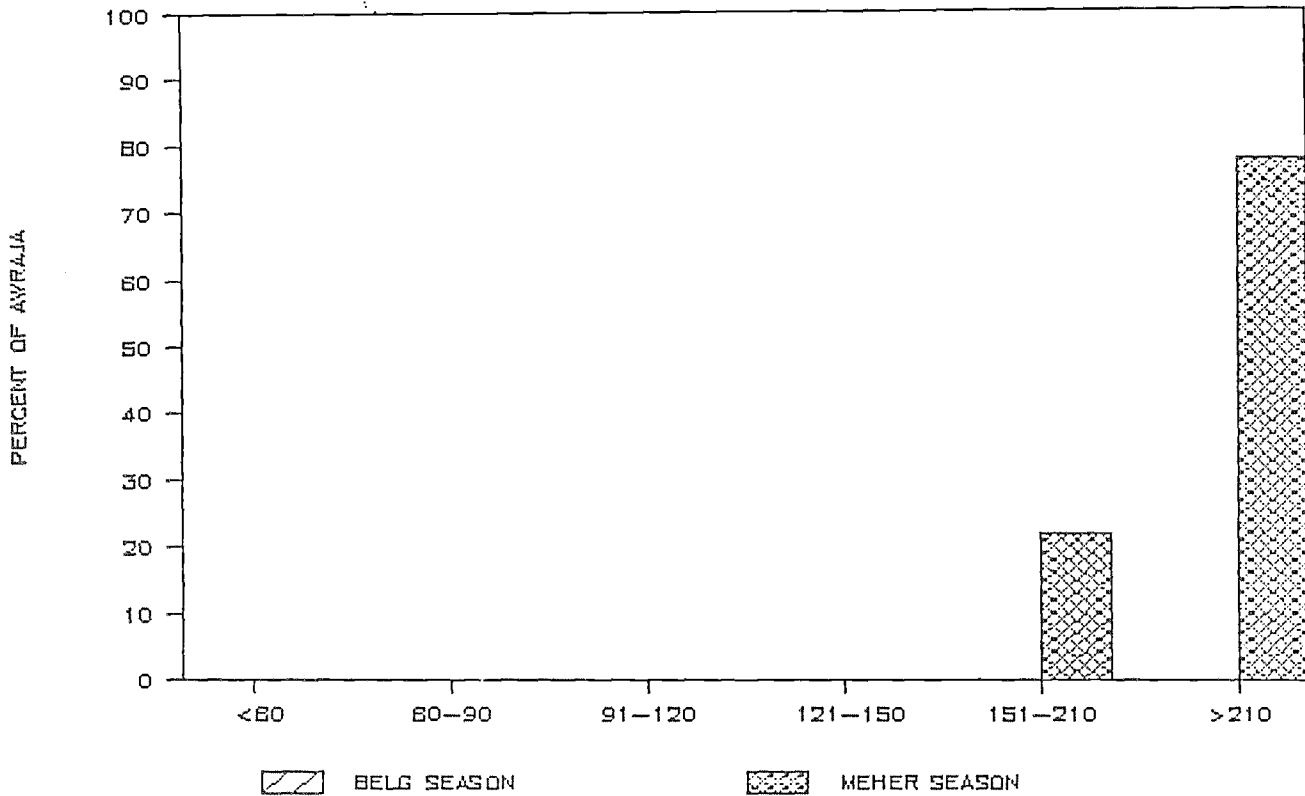
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ILUBABOR — GAMBELA



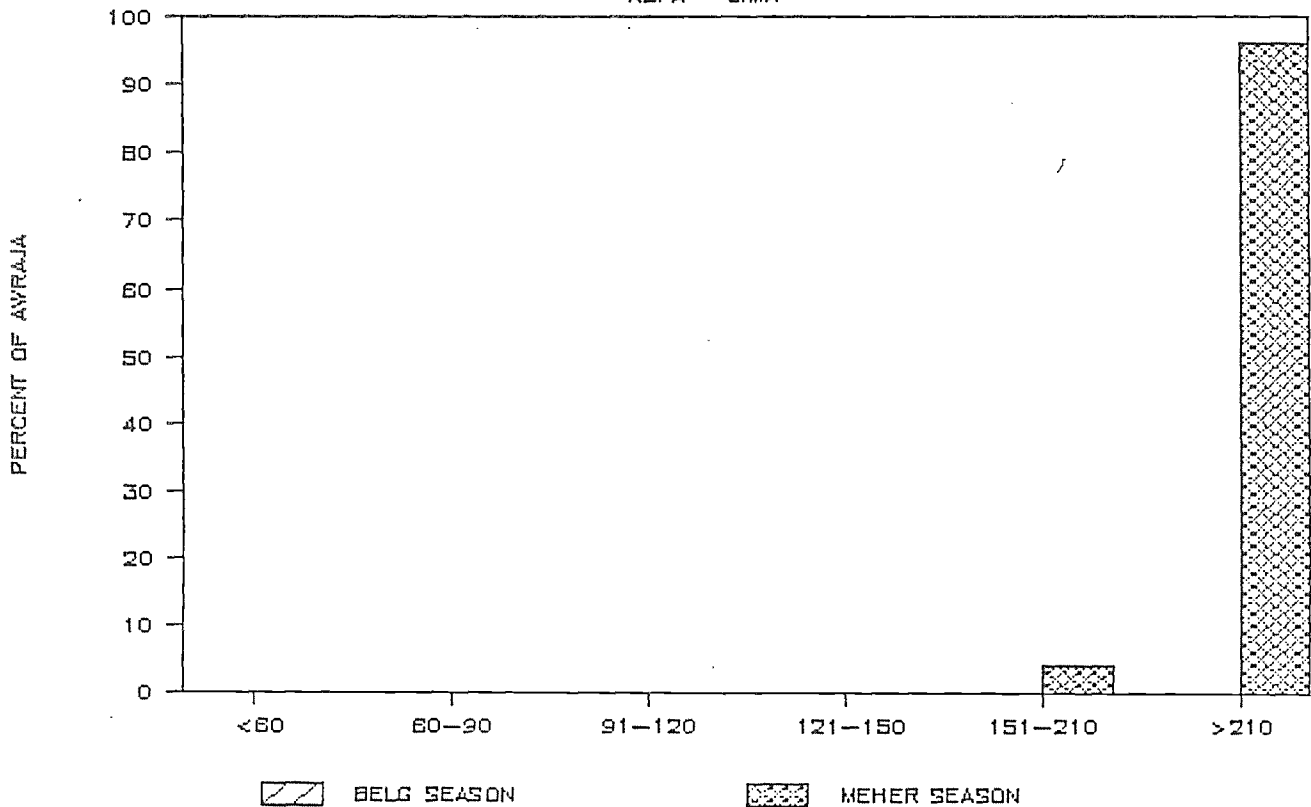
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KEFA - LIMU



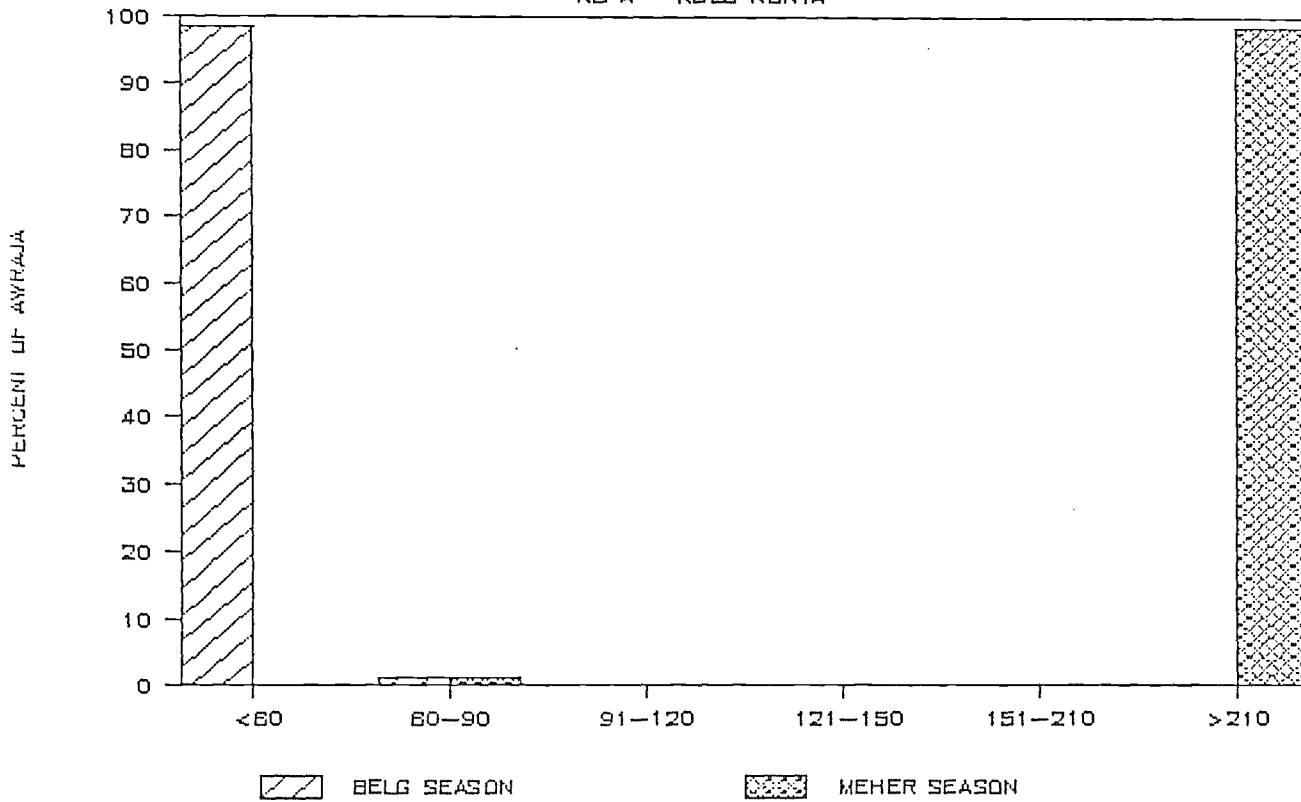
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KEFA - JIMA



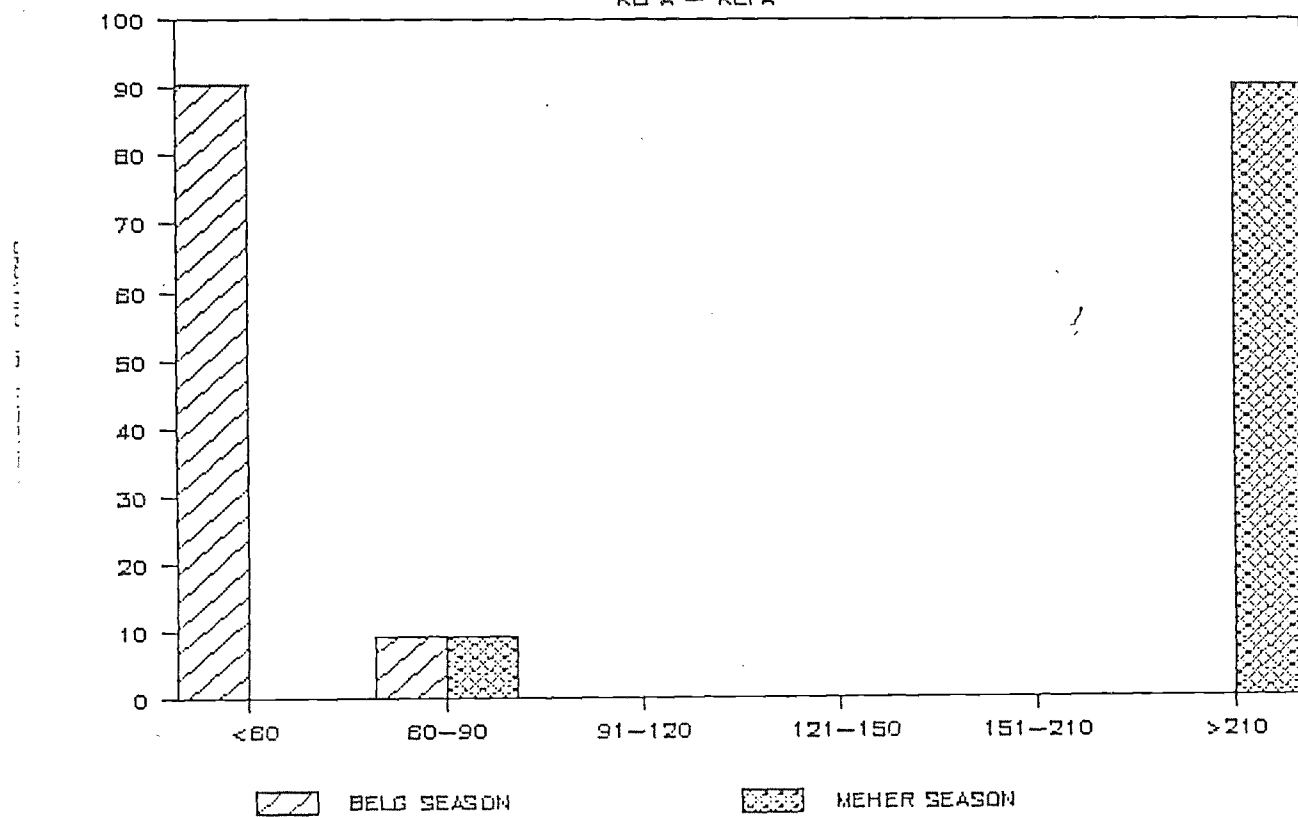
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KEFA - KULO KONTA



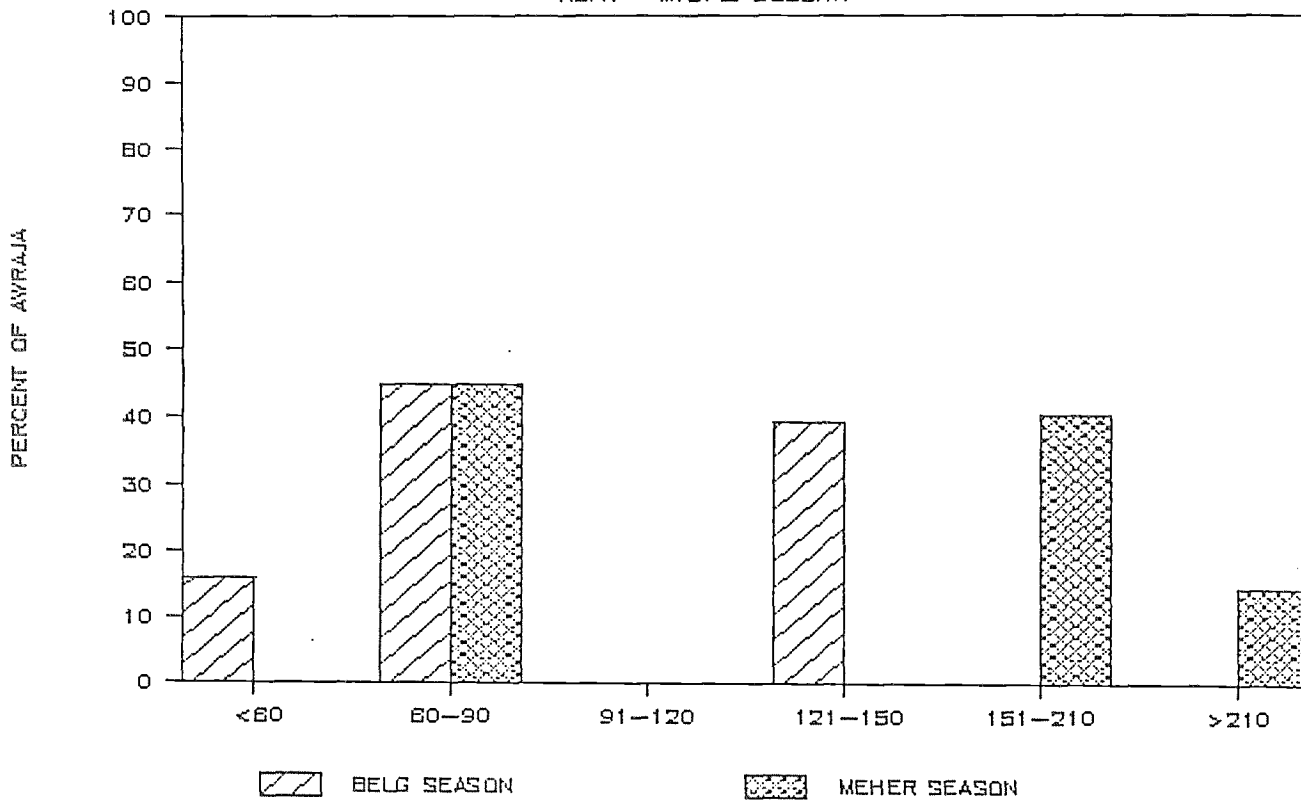
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KEFA - KEFA



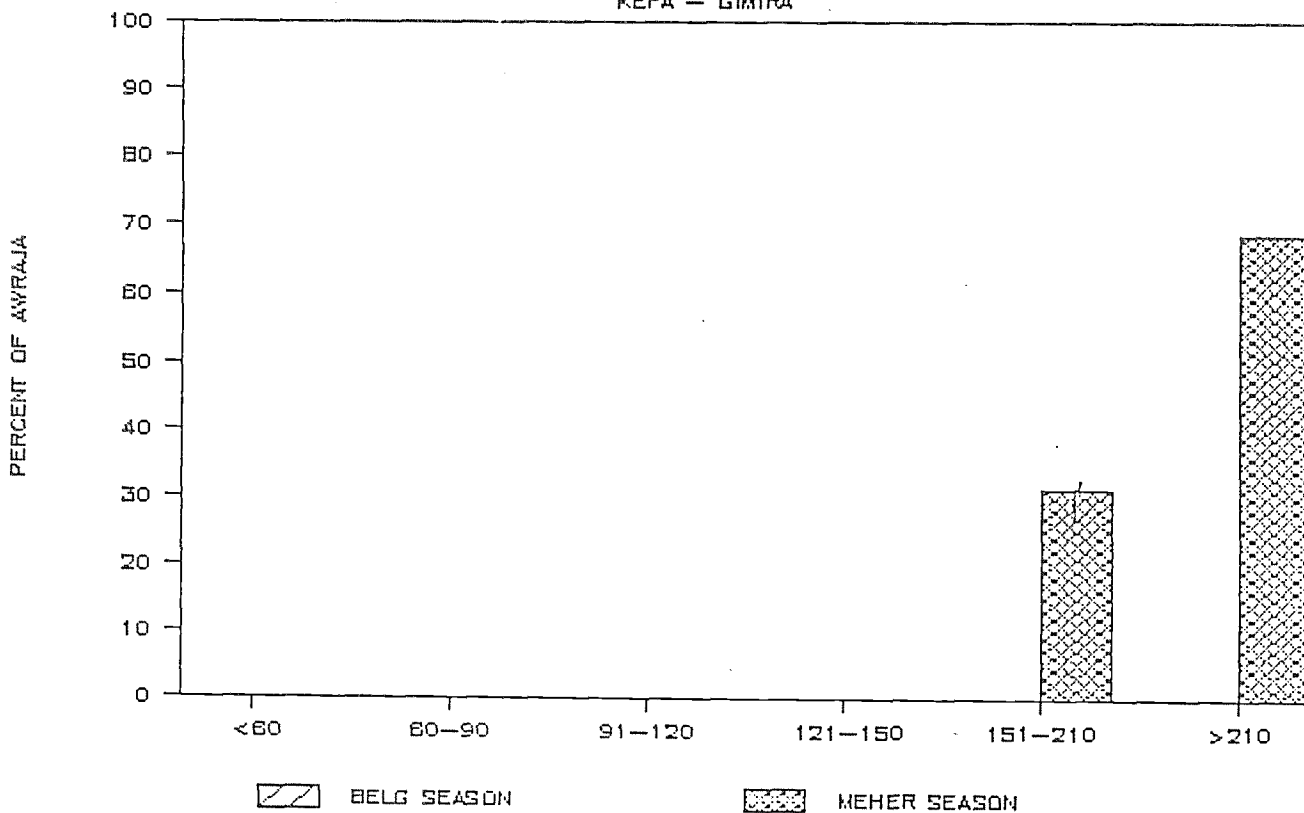
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KEFA - MAJI & GOLDIYA



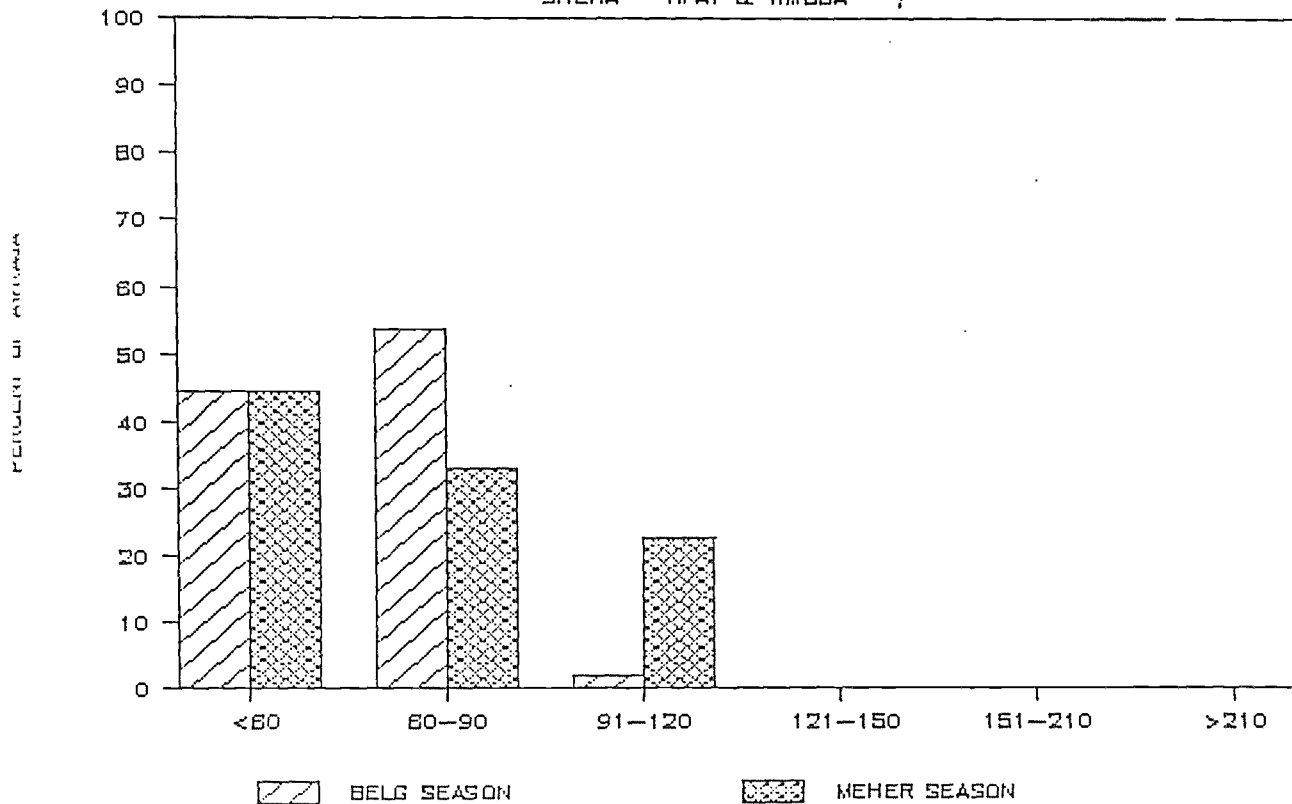
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KEFA - GIMIRA



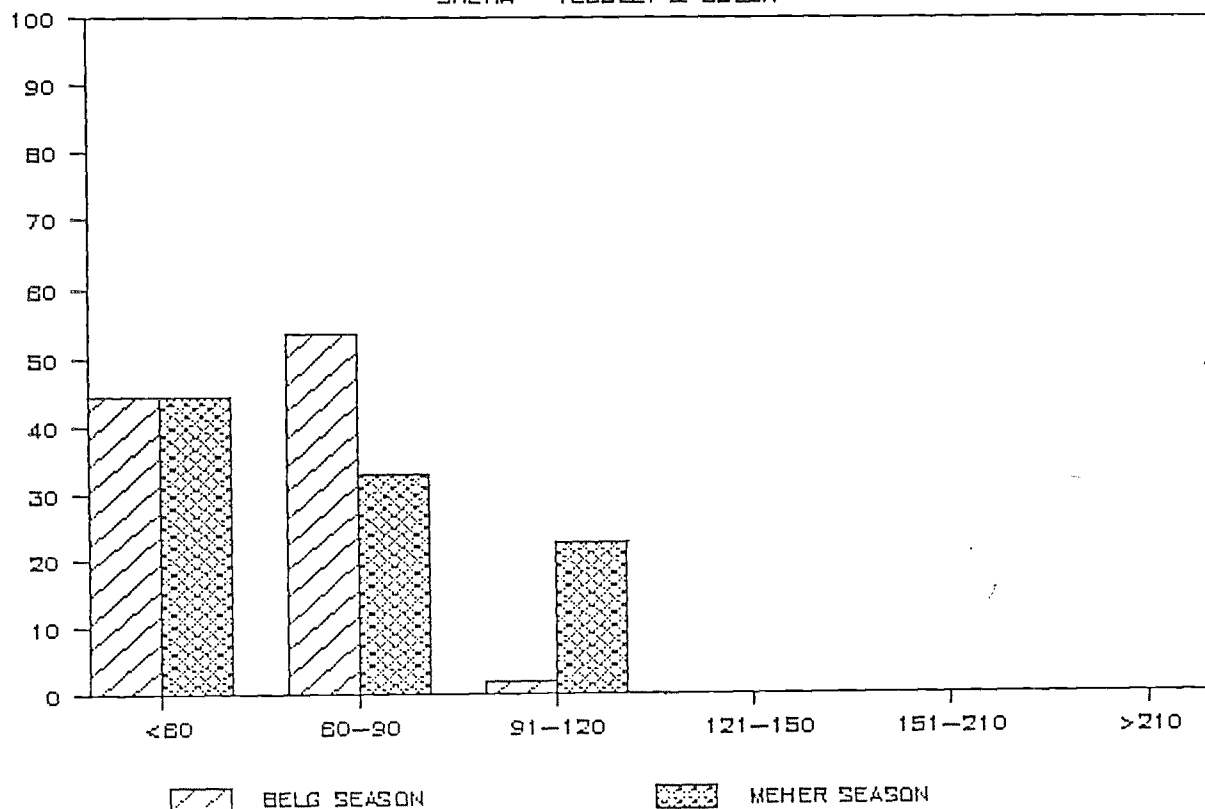
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SHEWA - YIFAT & TIMUGA



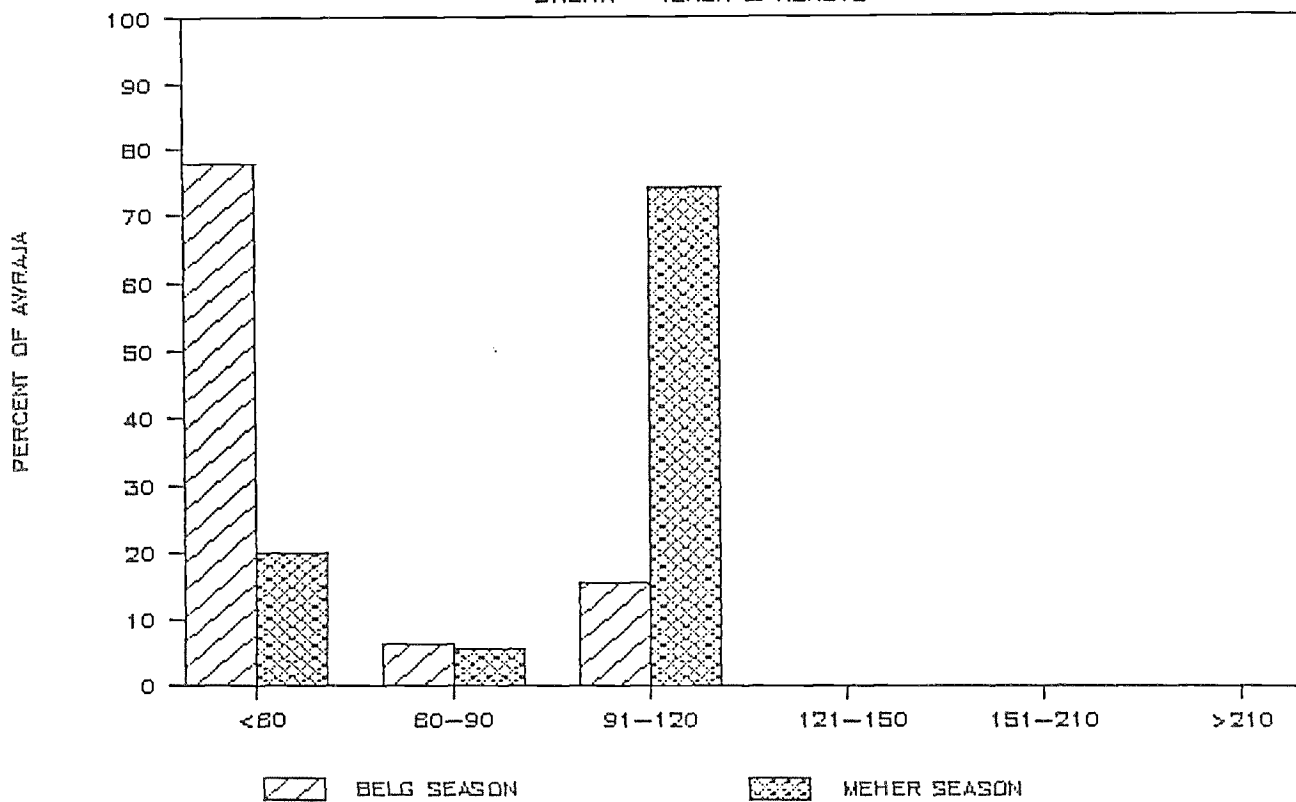
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SHEWA - TEGULET & BULGA



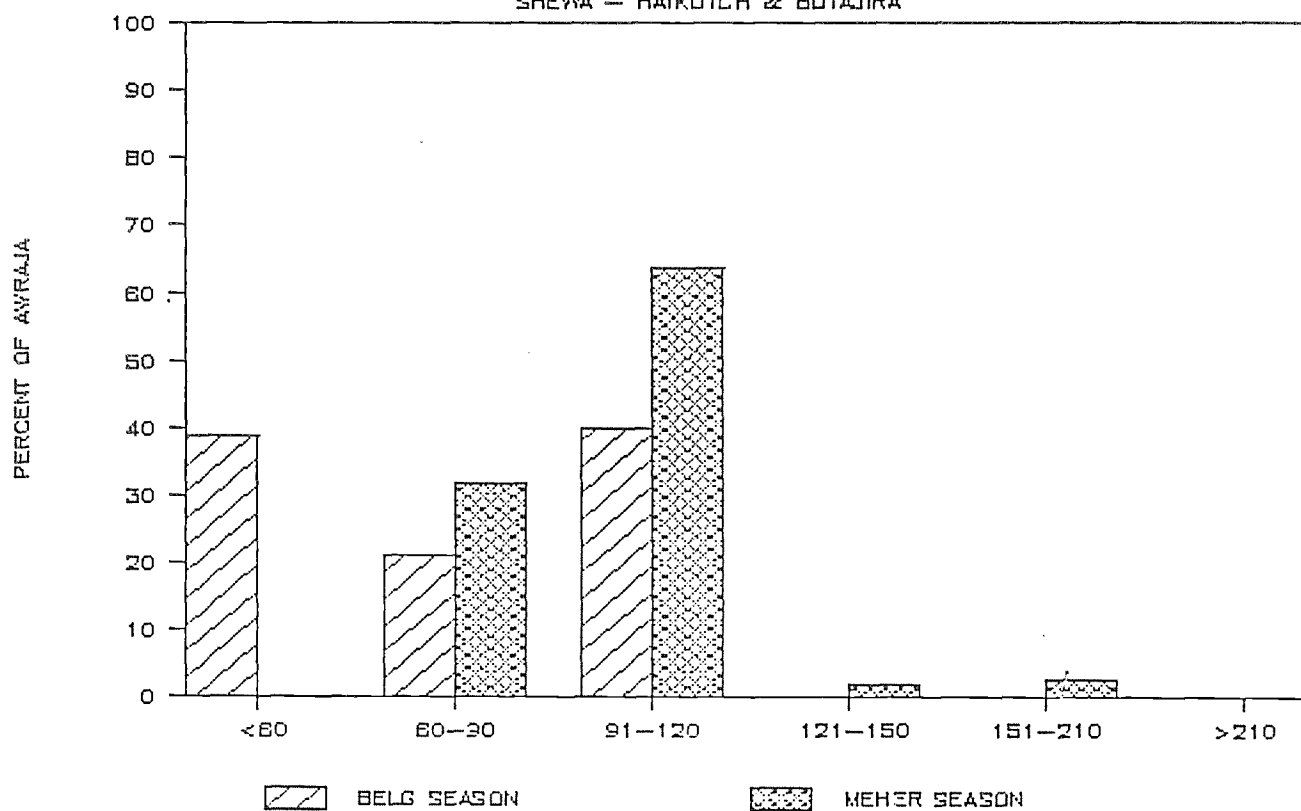
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SHEWA — YERER & KEREYU



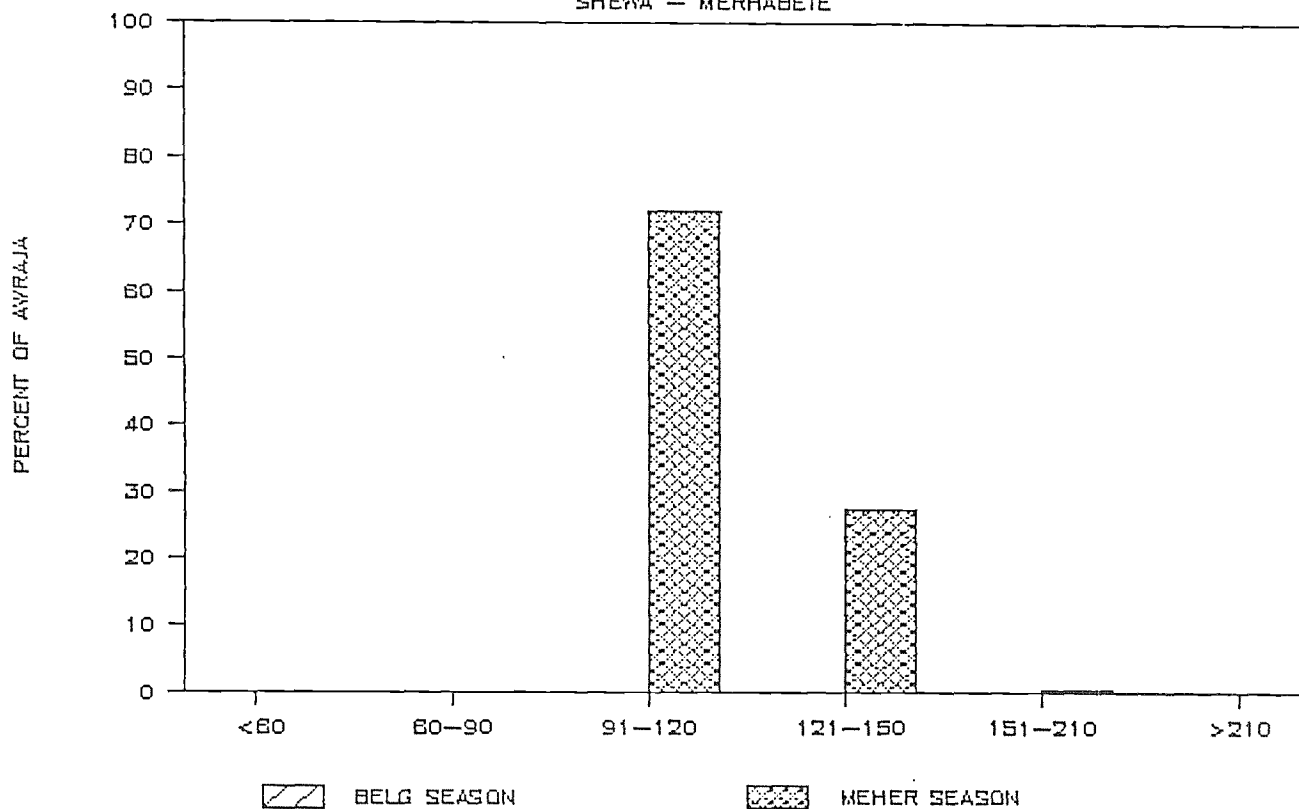
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SHEWA — HAIKOTCH & BUTAJIRA



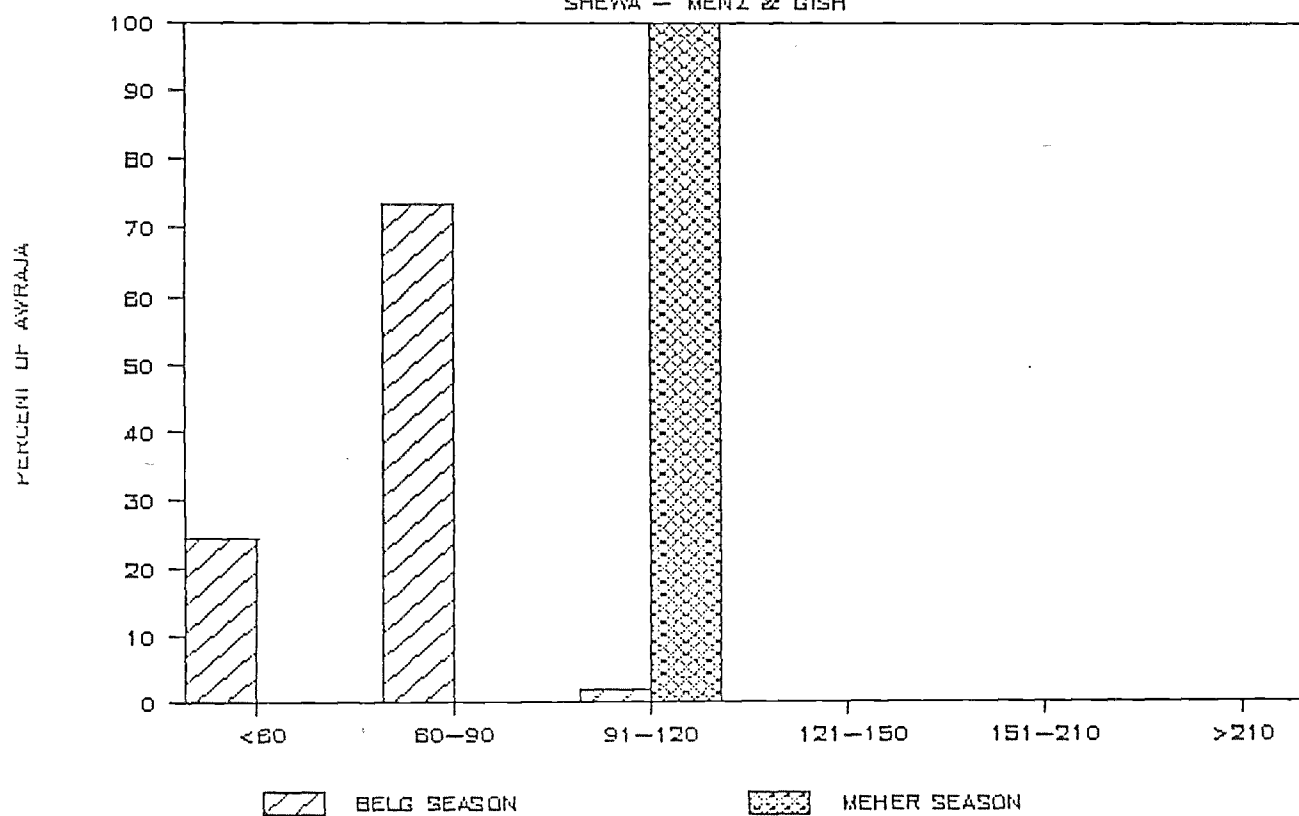
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SHEWA - MERHABETE



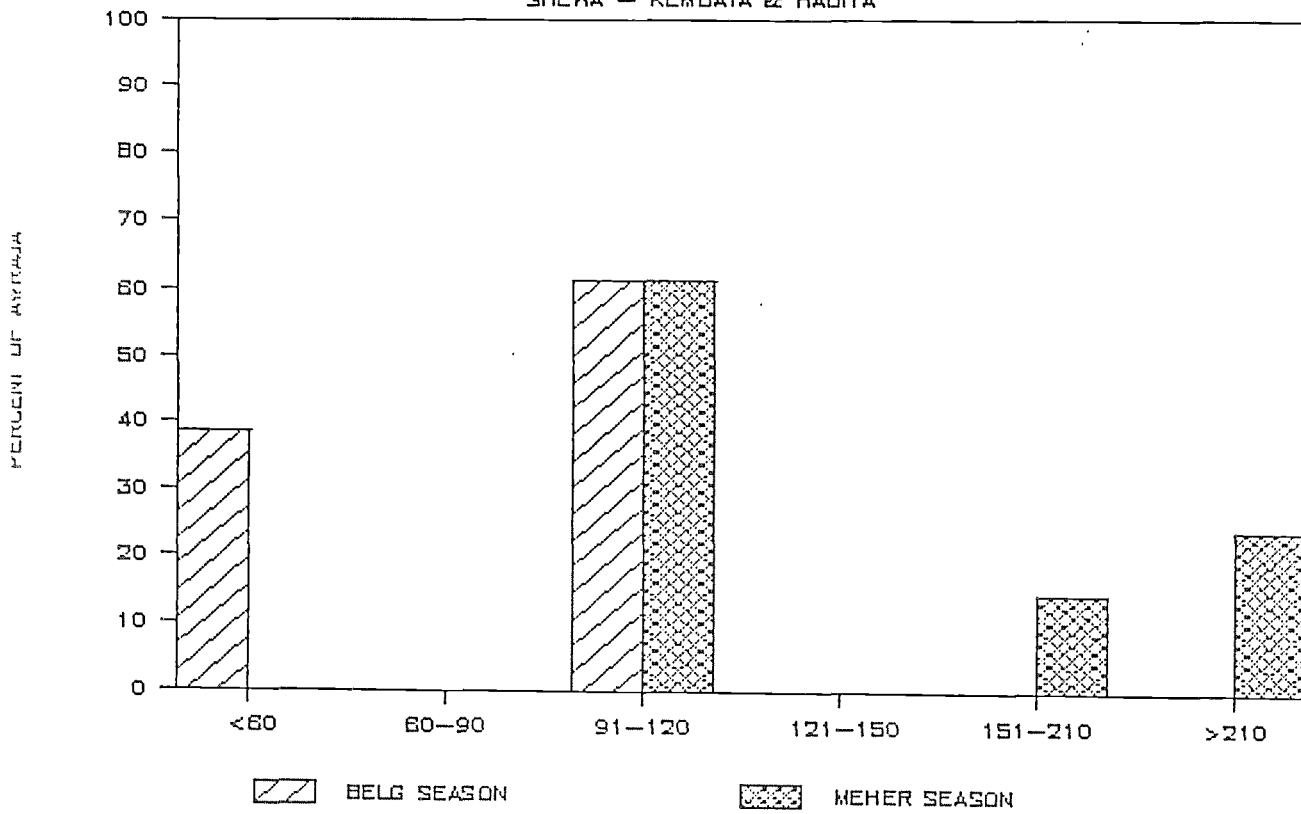
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SHEWA - MENZ & GISH



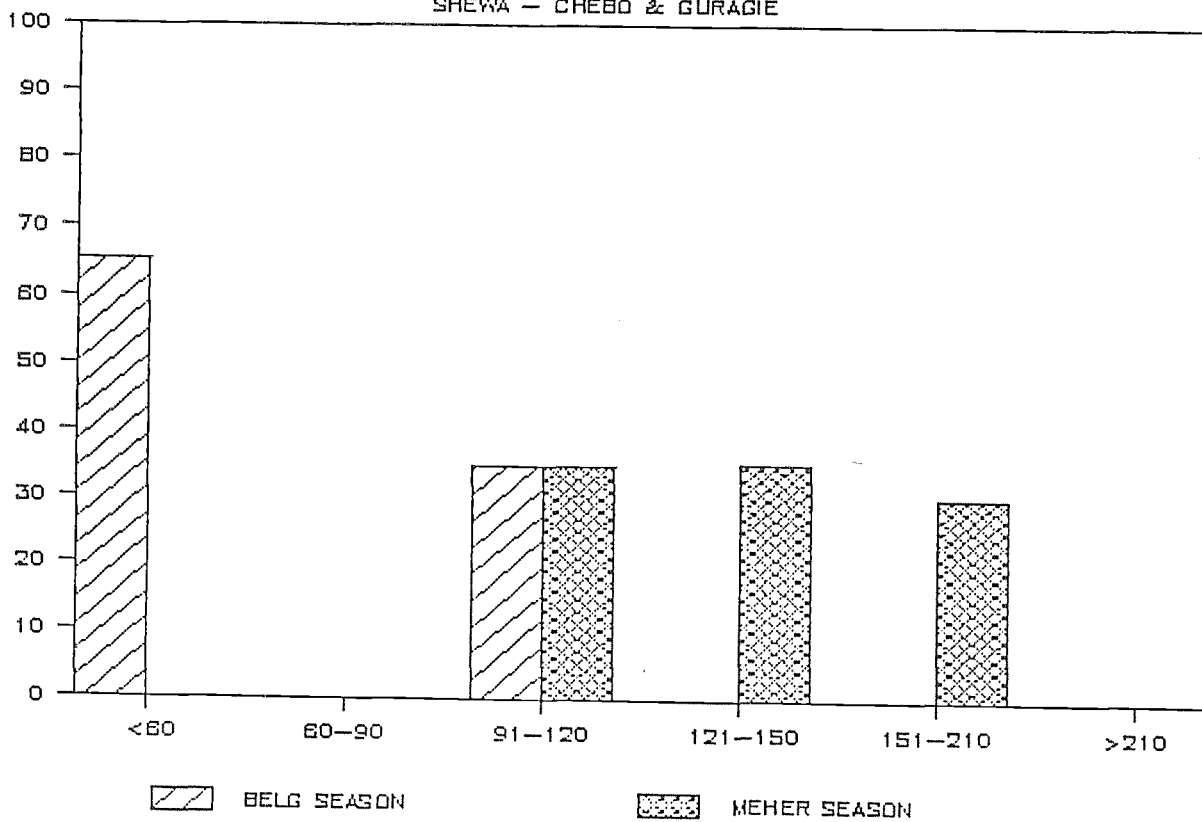
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SHEWA — KEMBATA & HADIYA



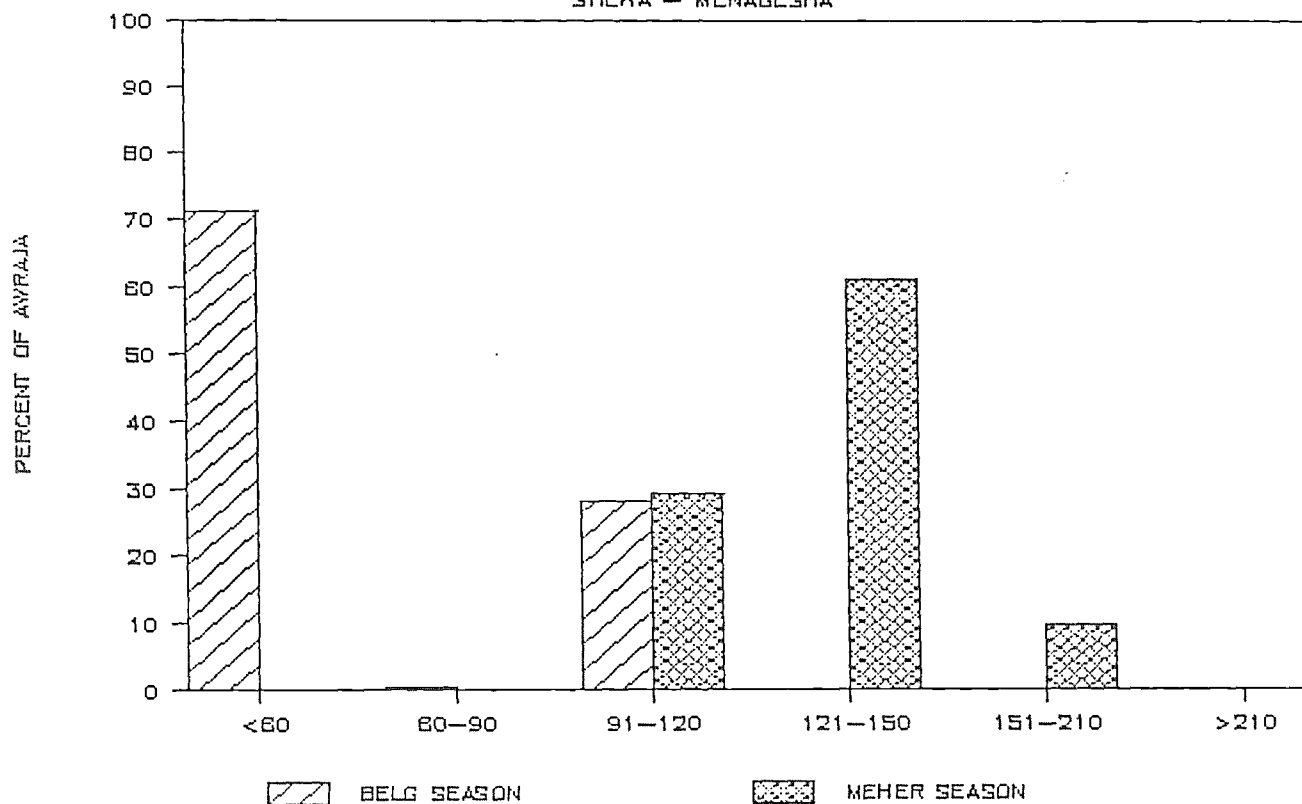
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SHEWA — CHEBO & GURAGIE



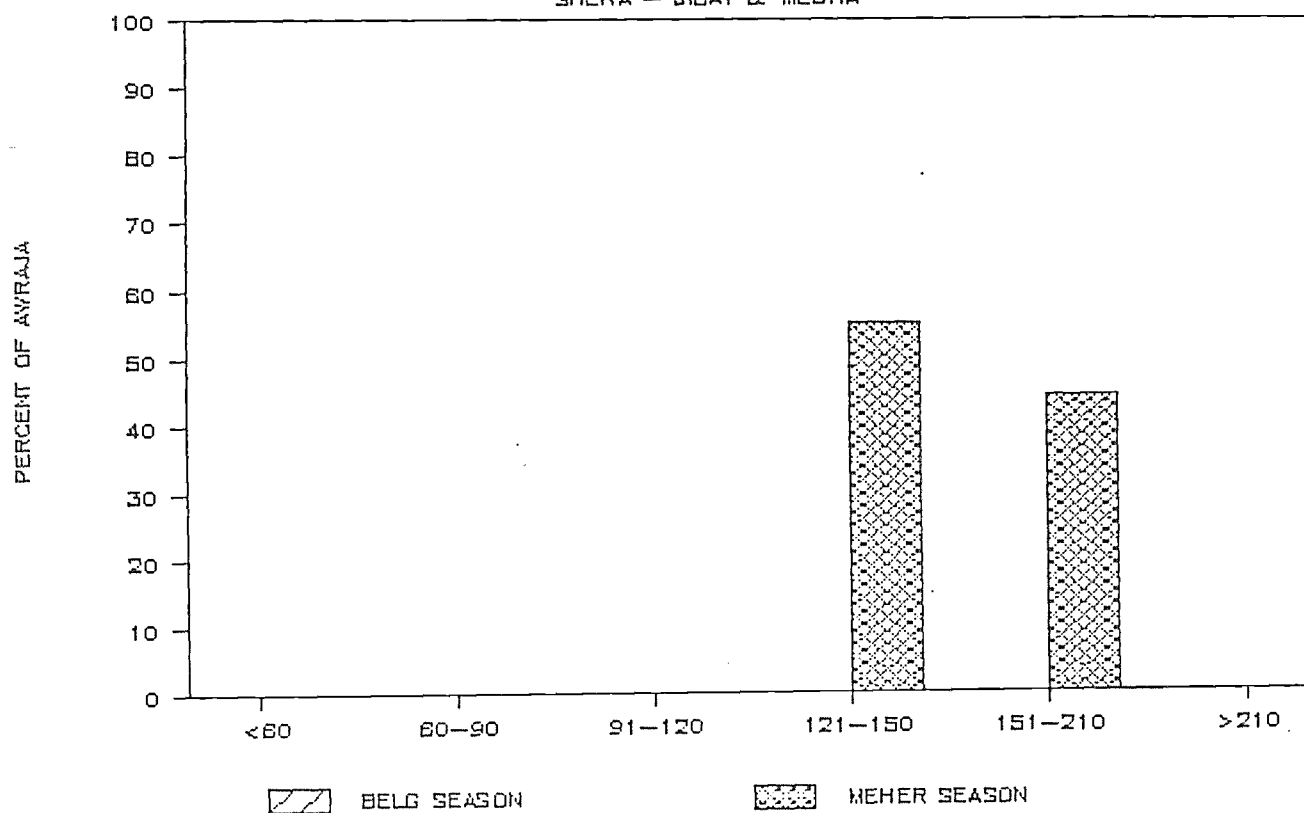
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SHEWA — MENAGESHA



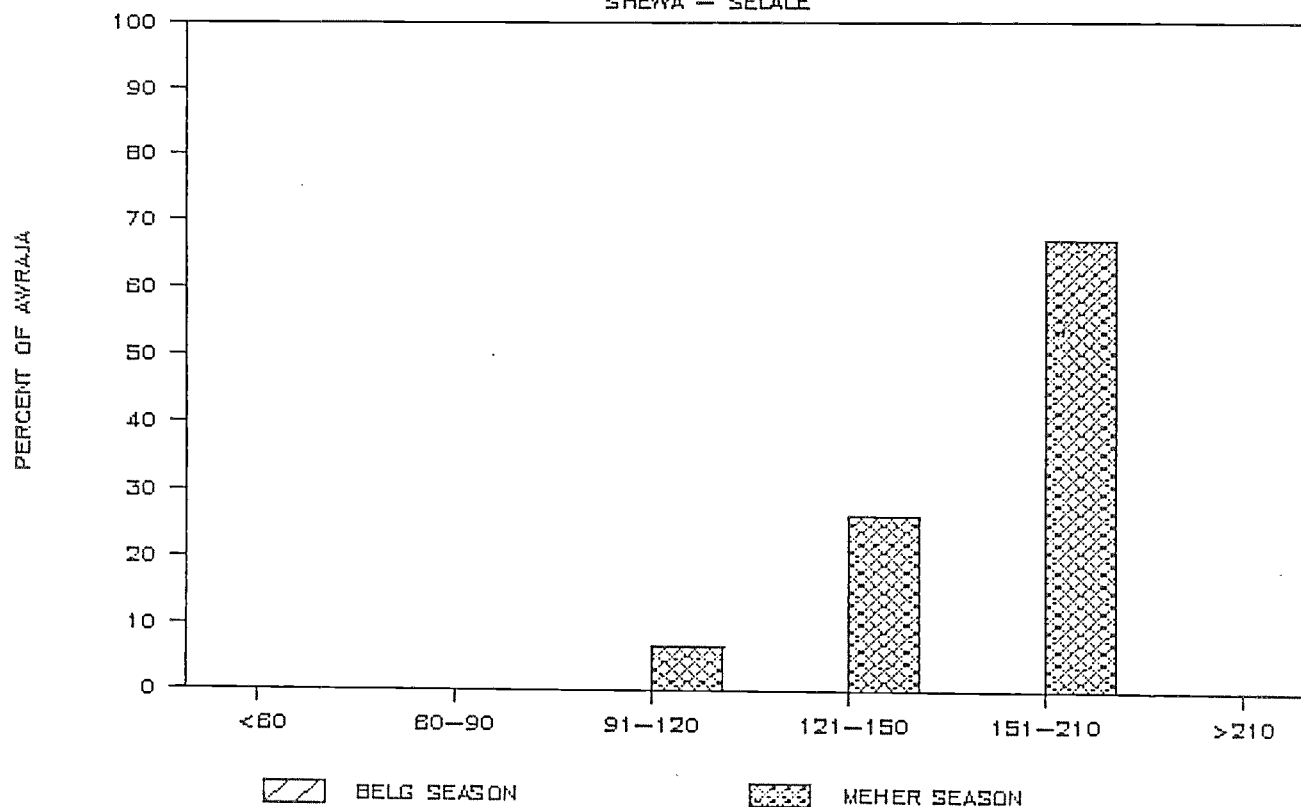
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SHEWA — JIBAT & MECHA



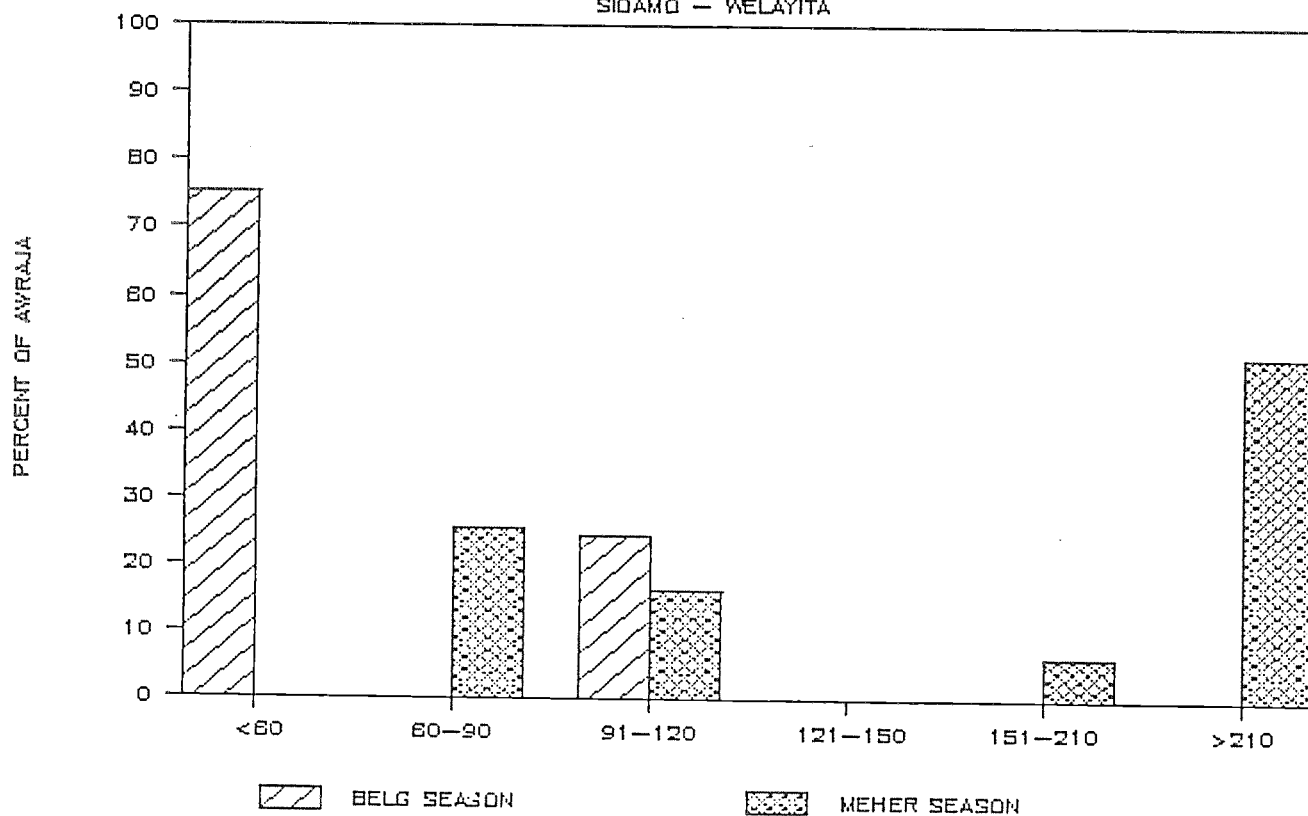
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SHEWA — SELALE



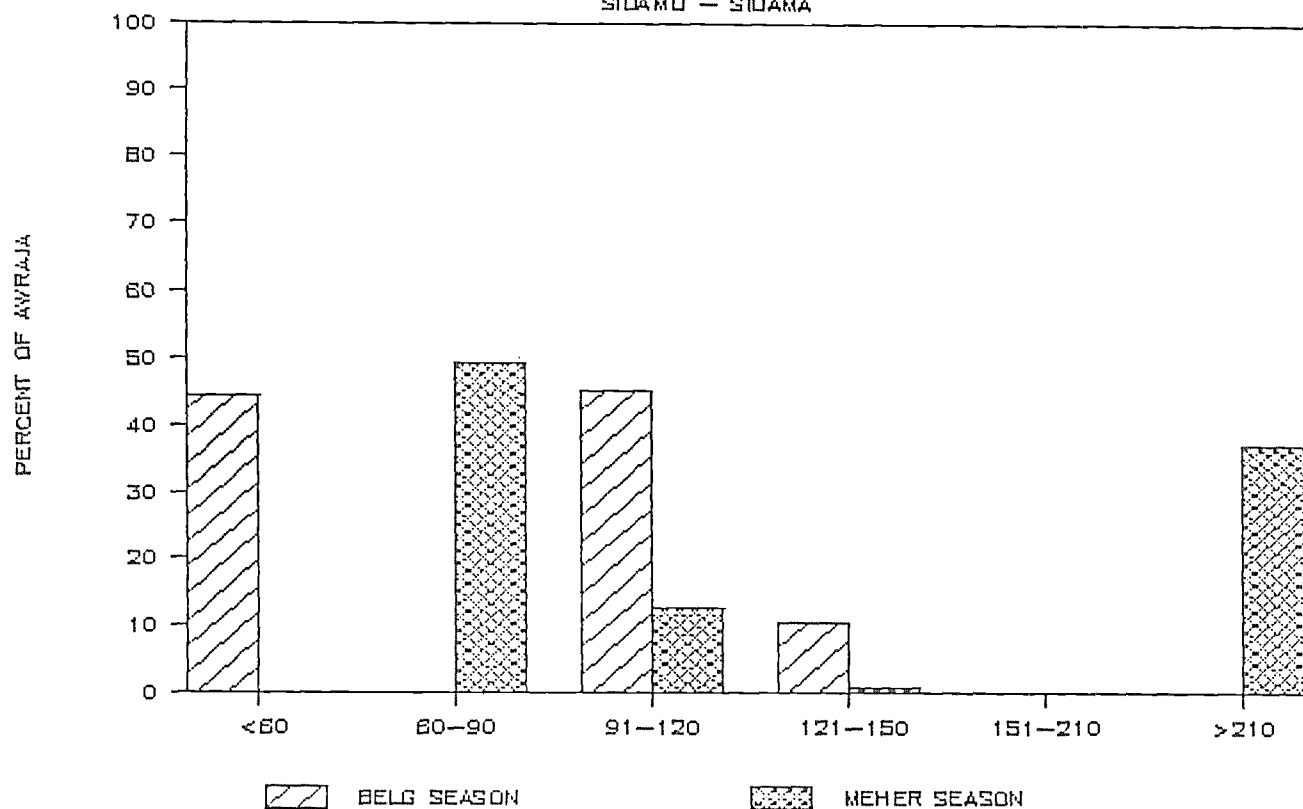
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SIDAMO — WELAYITA



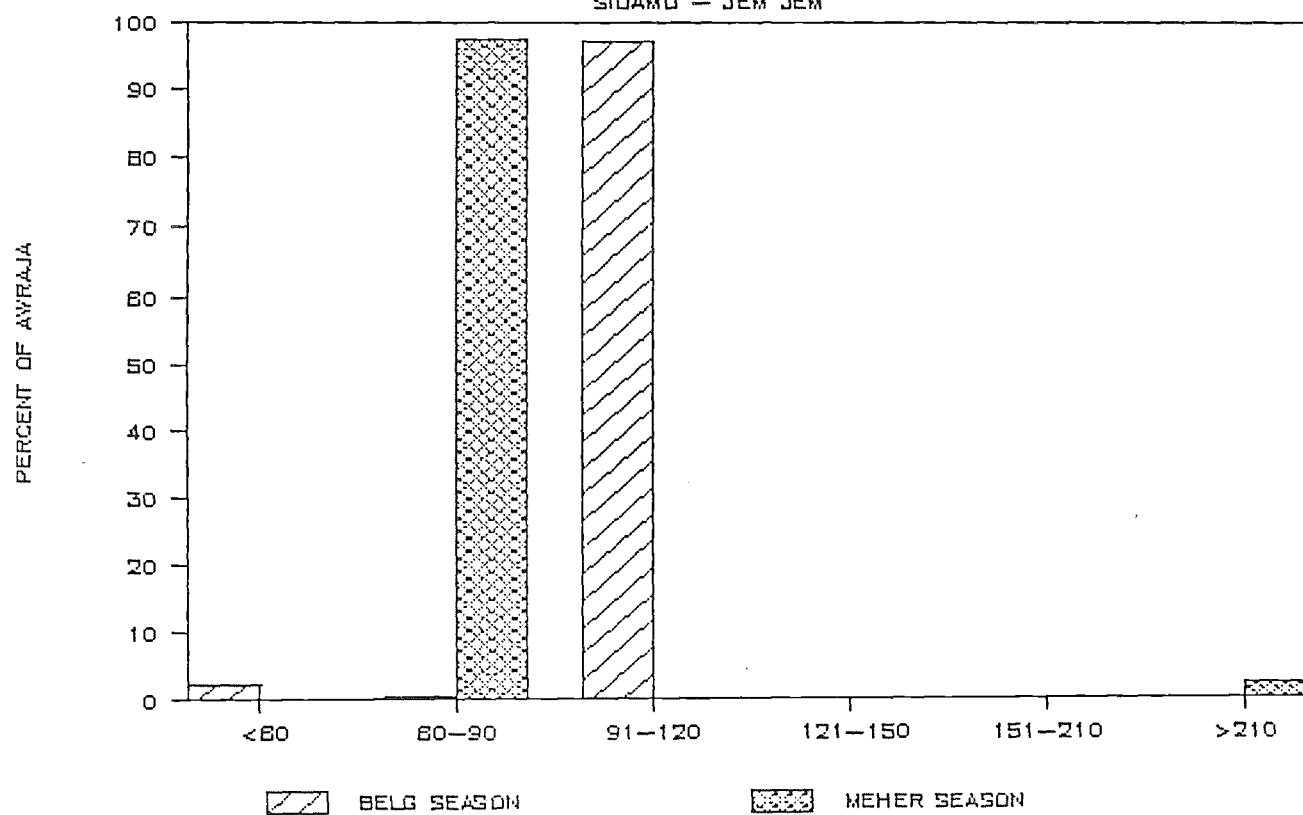
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SIDAMO - SIDAMA



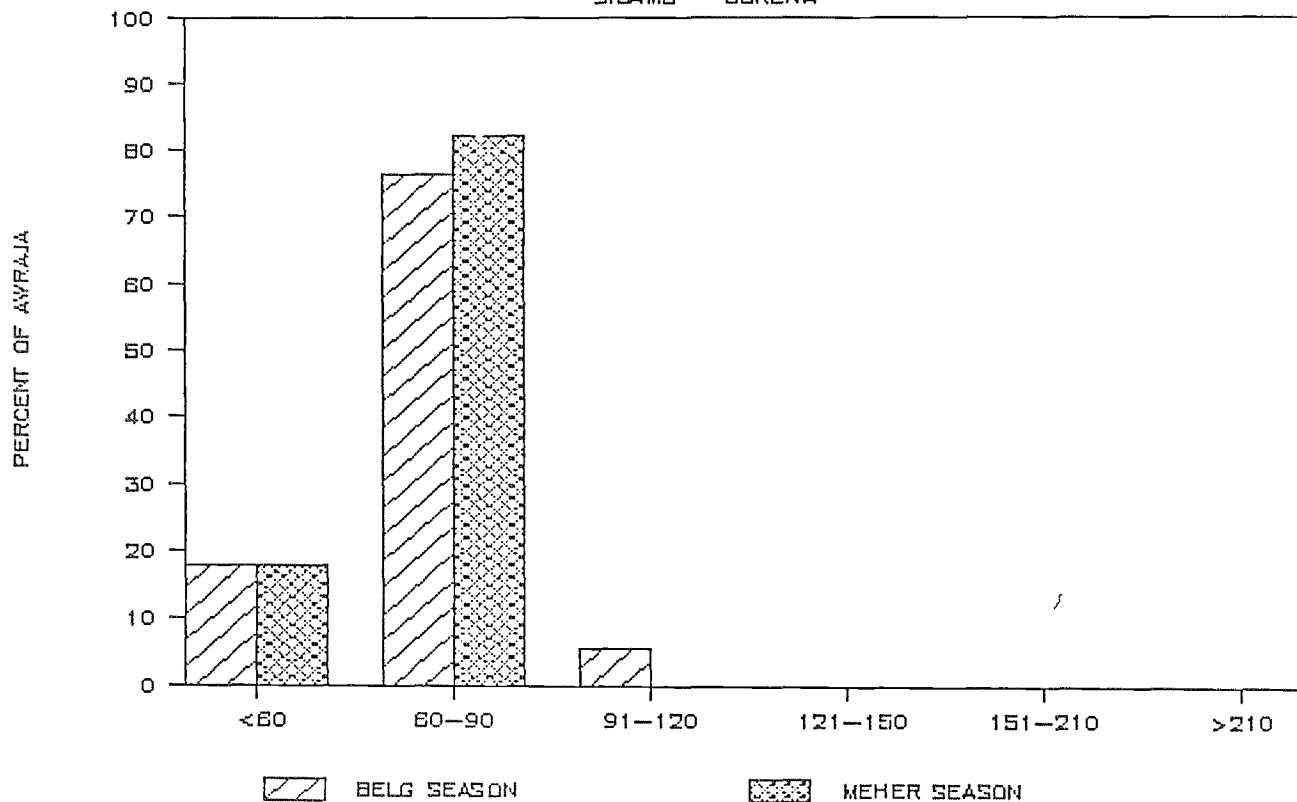
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SIDAMO - JEM JEM



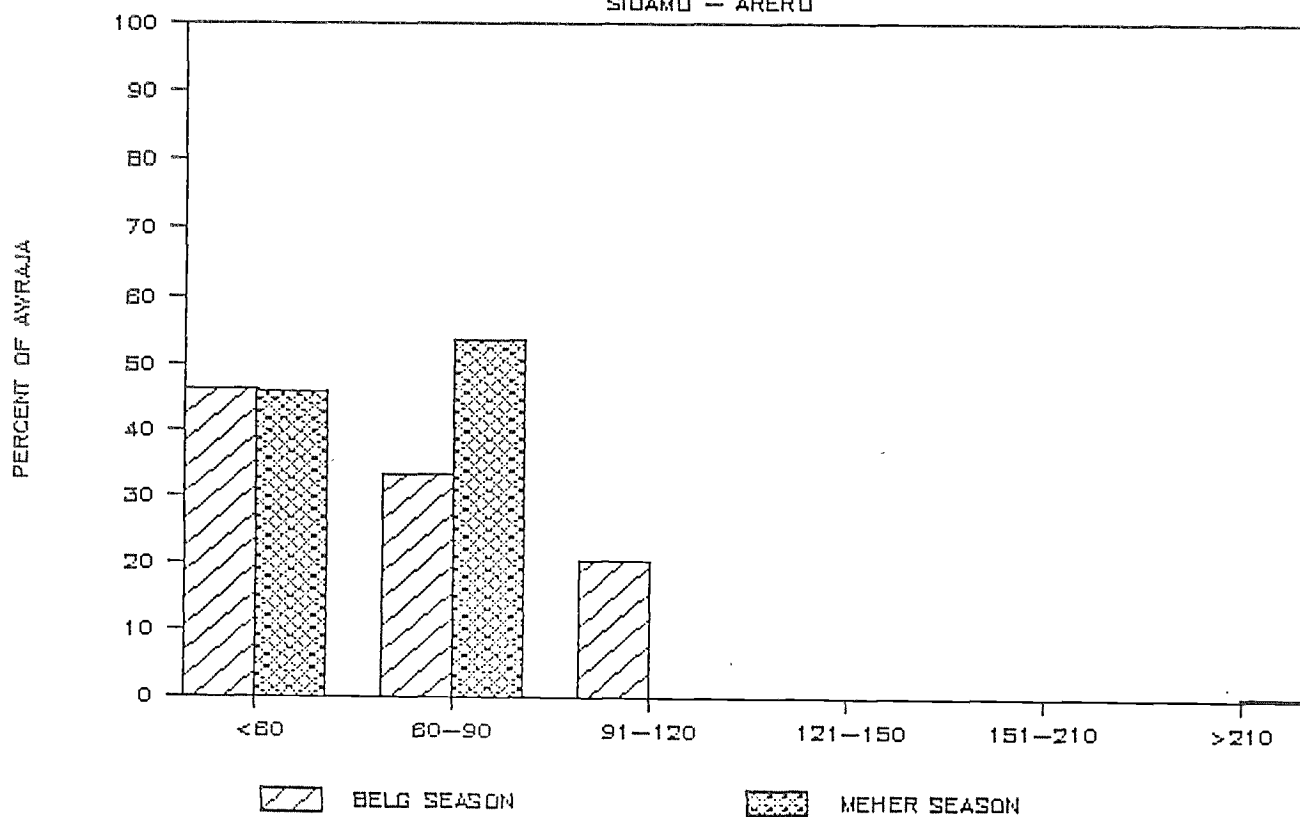
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SIDAMO — BORENA



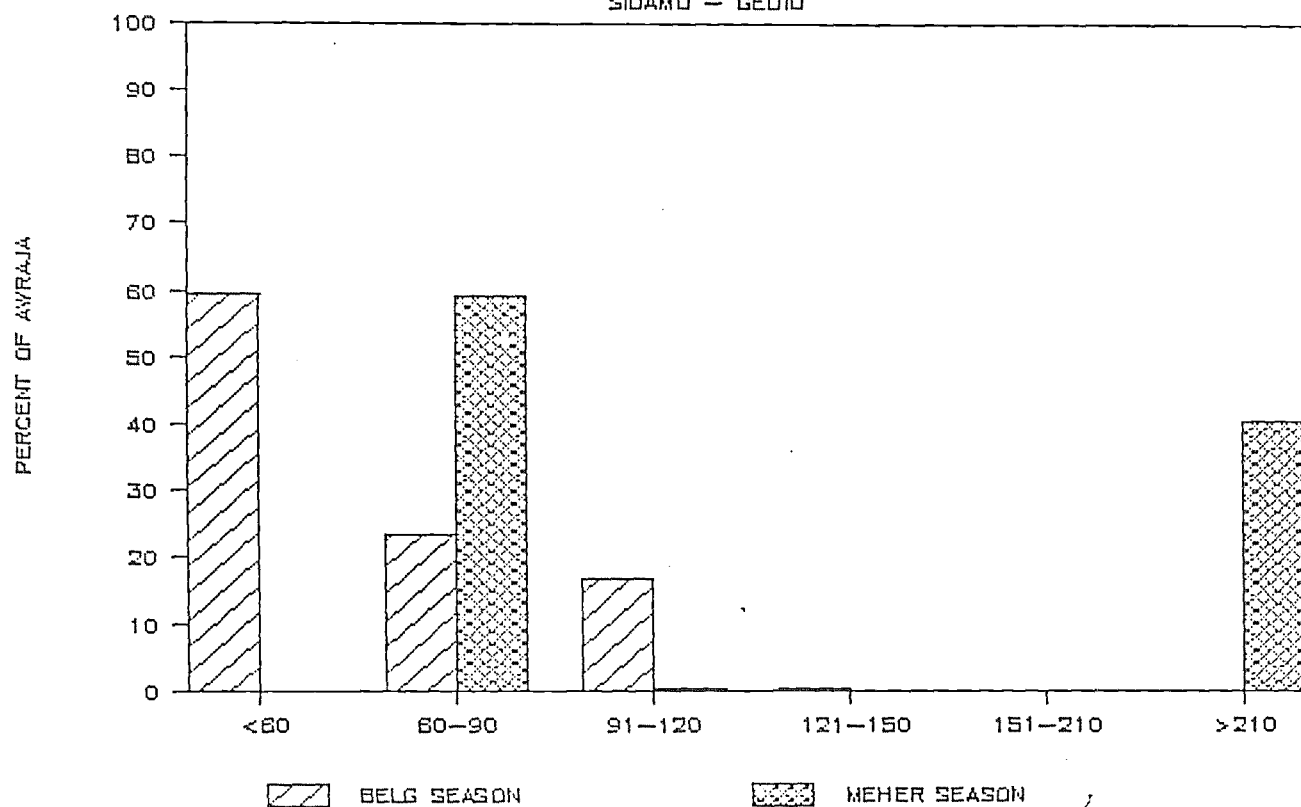
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SIDAMO — ARERO



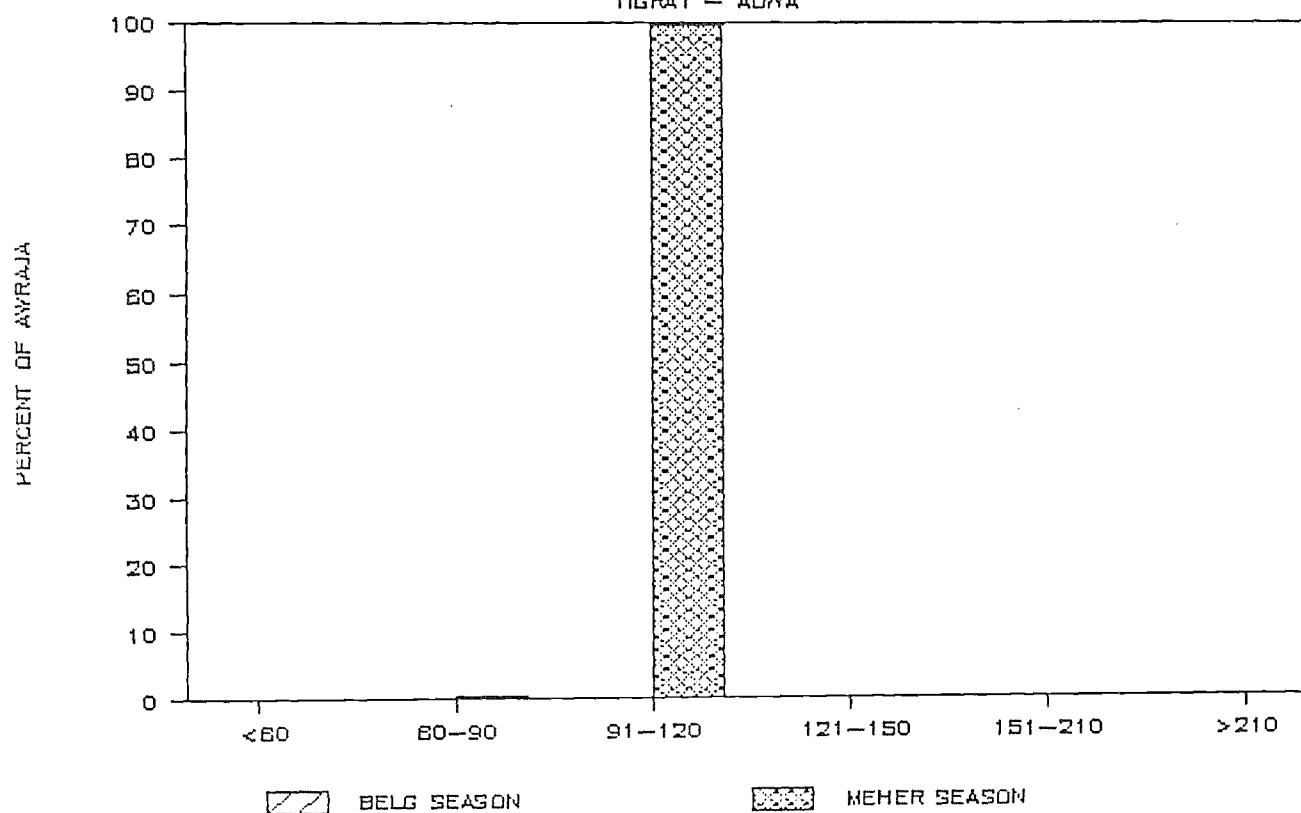
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SIDAMO - BEDIQ



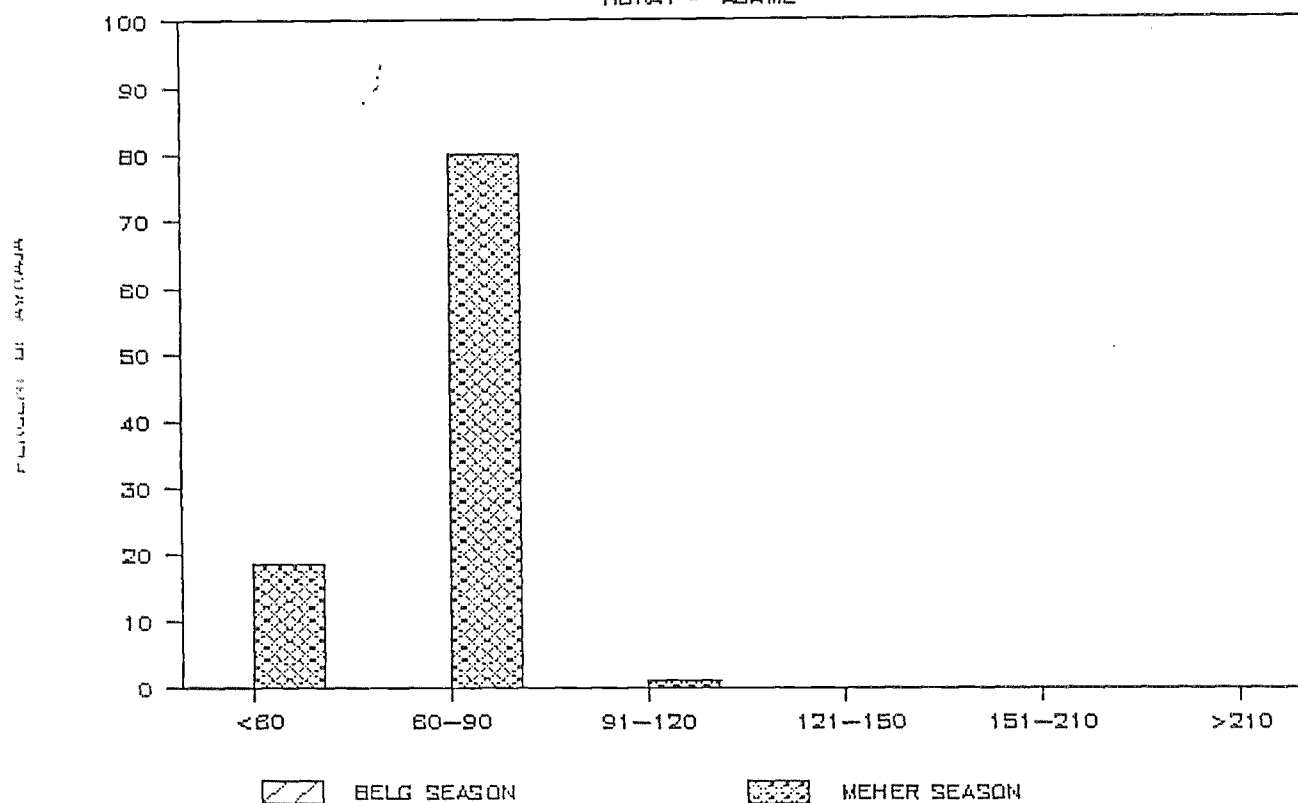
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TIGRAY - ADWA



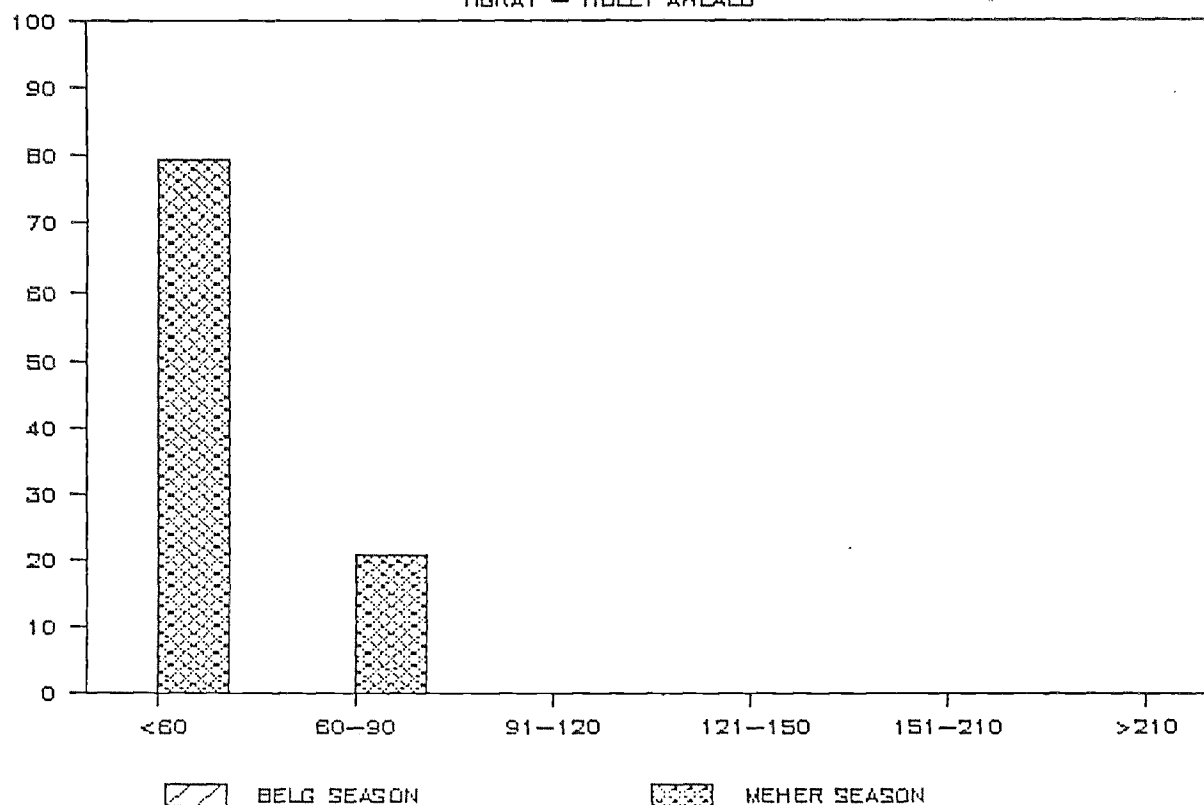
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TIGRAY — AGAME



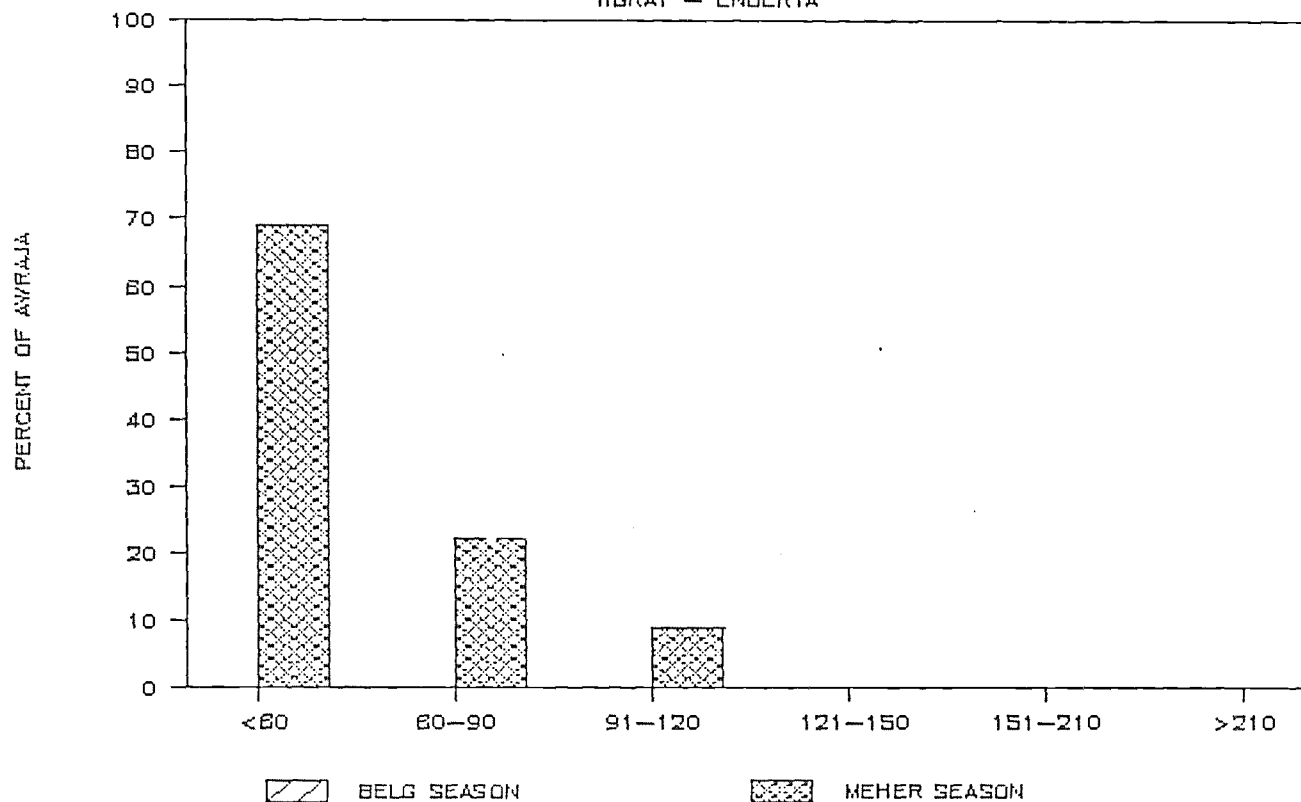
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TIGRAY — HULET AWLALD



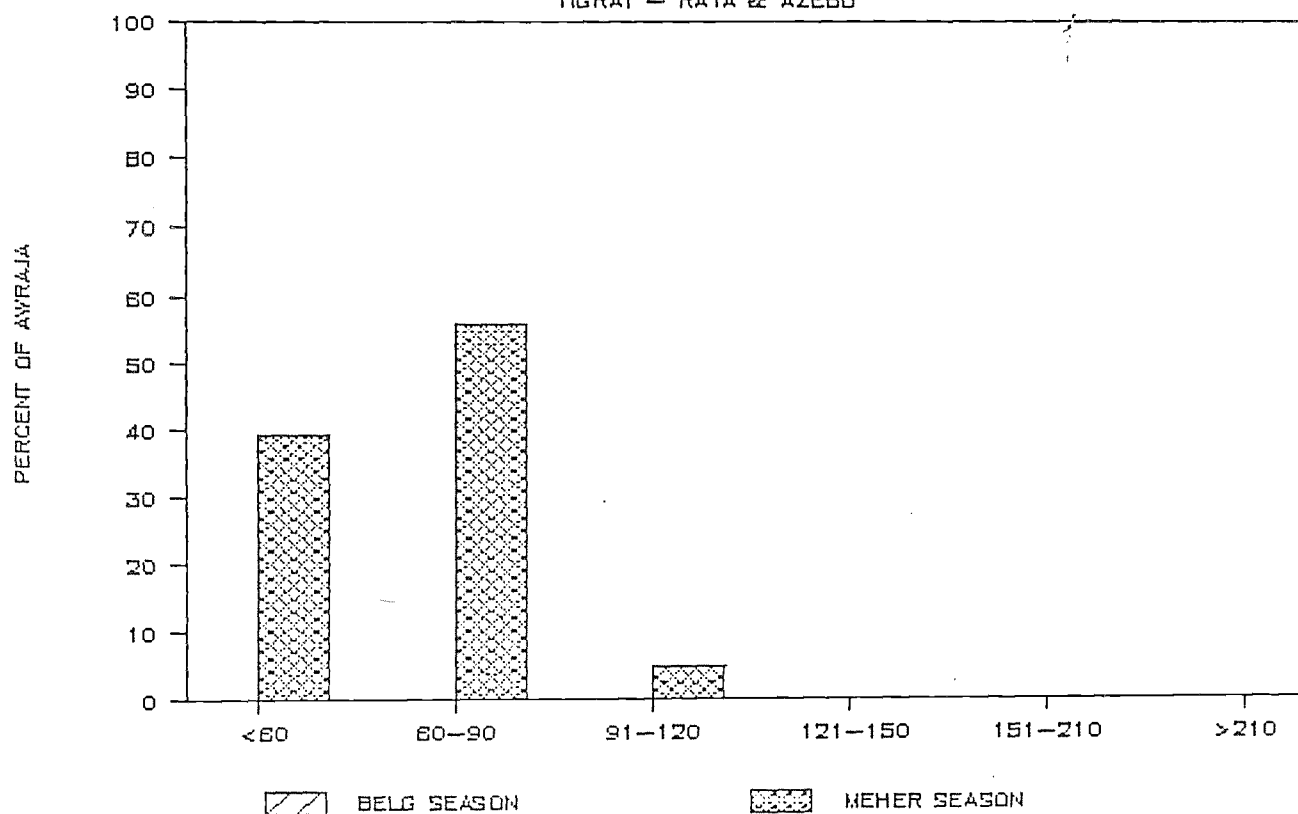
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TIGRAY — ENDERTA



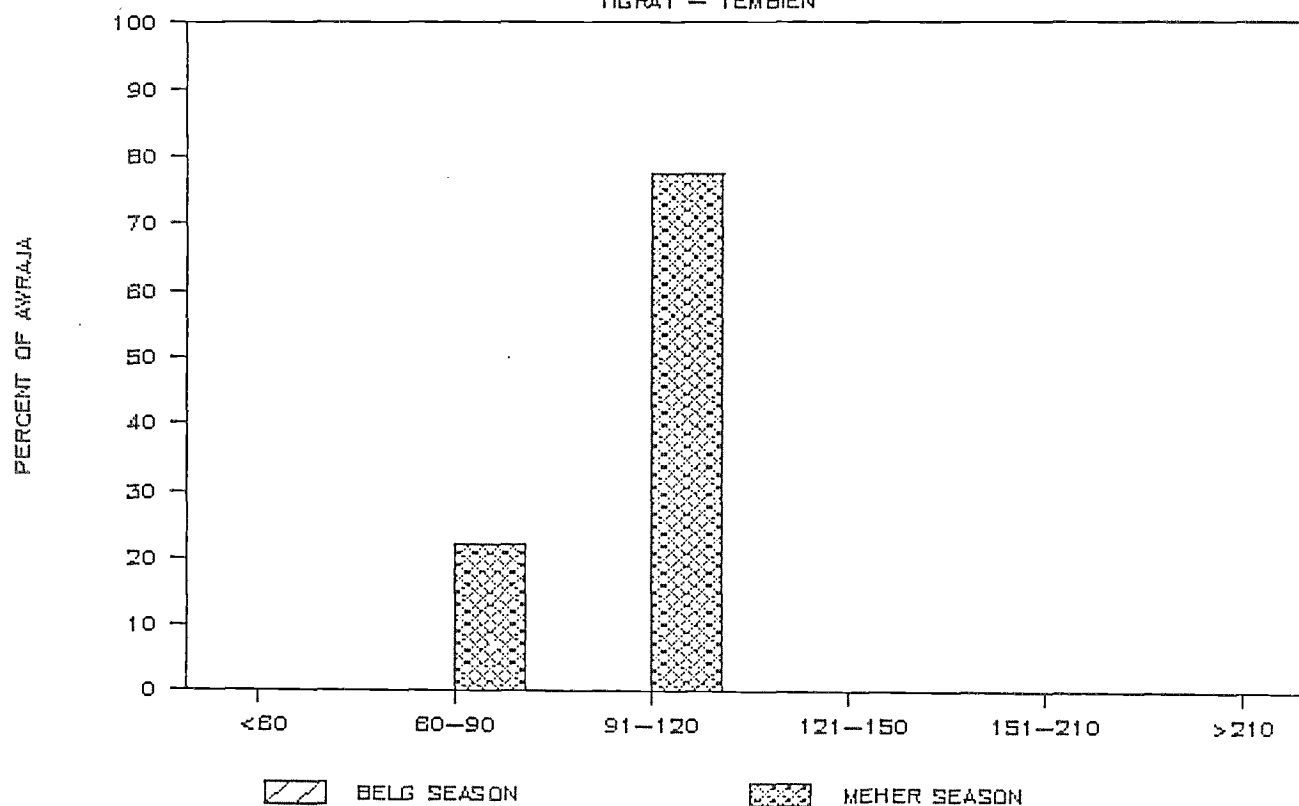
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TIGRAY — RAYA & AZEBO



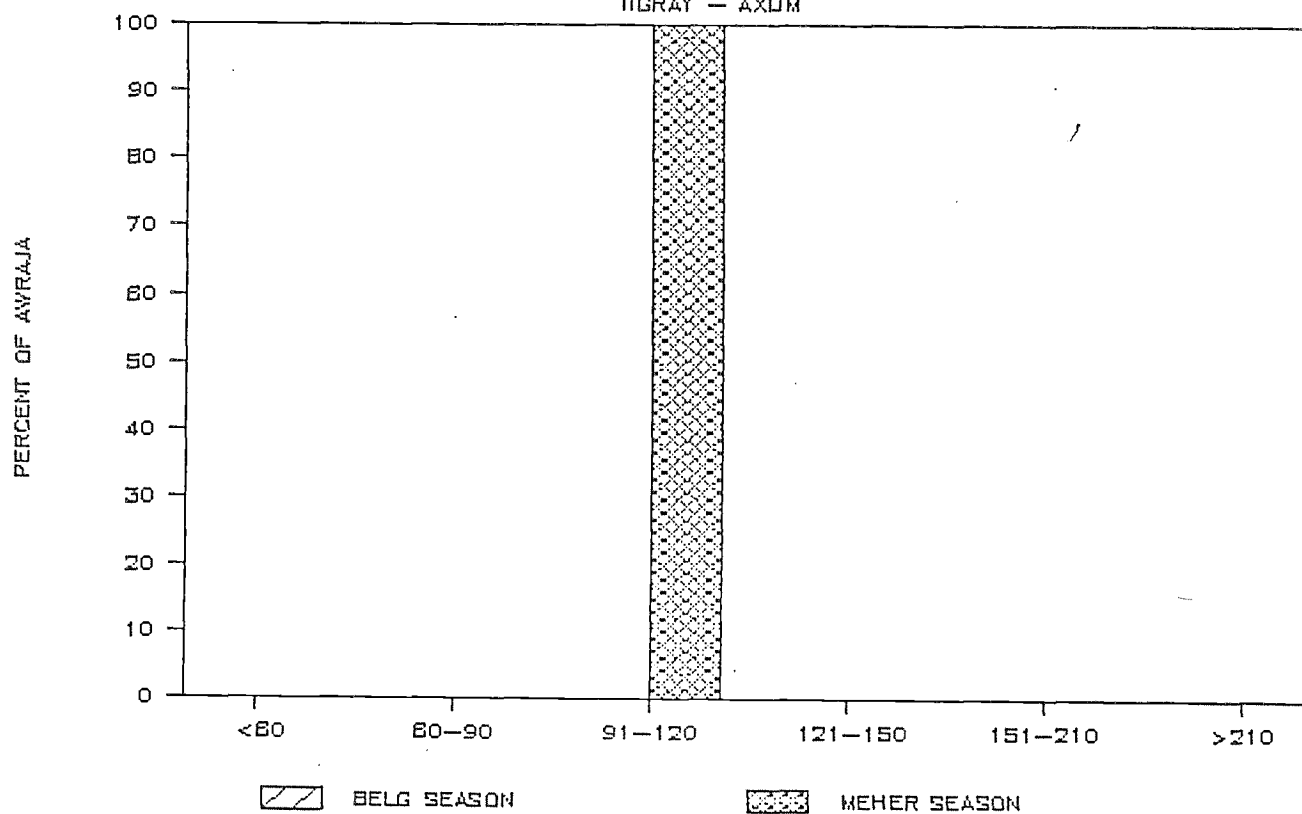
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TIGRAY — TEMBIEN



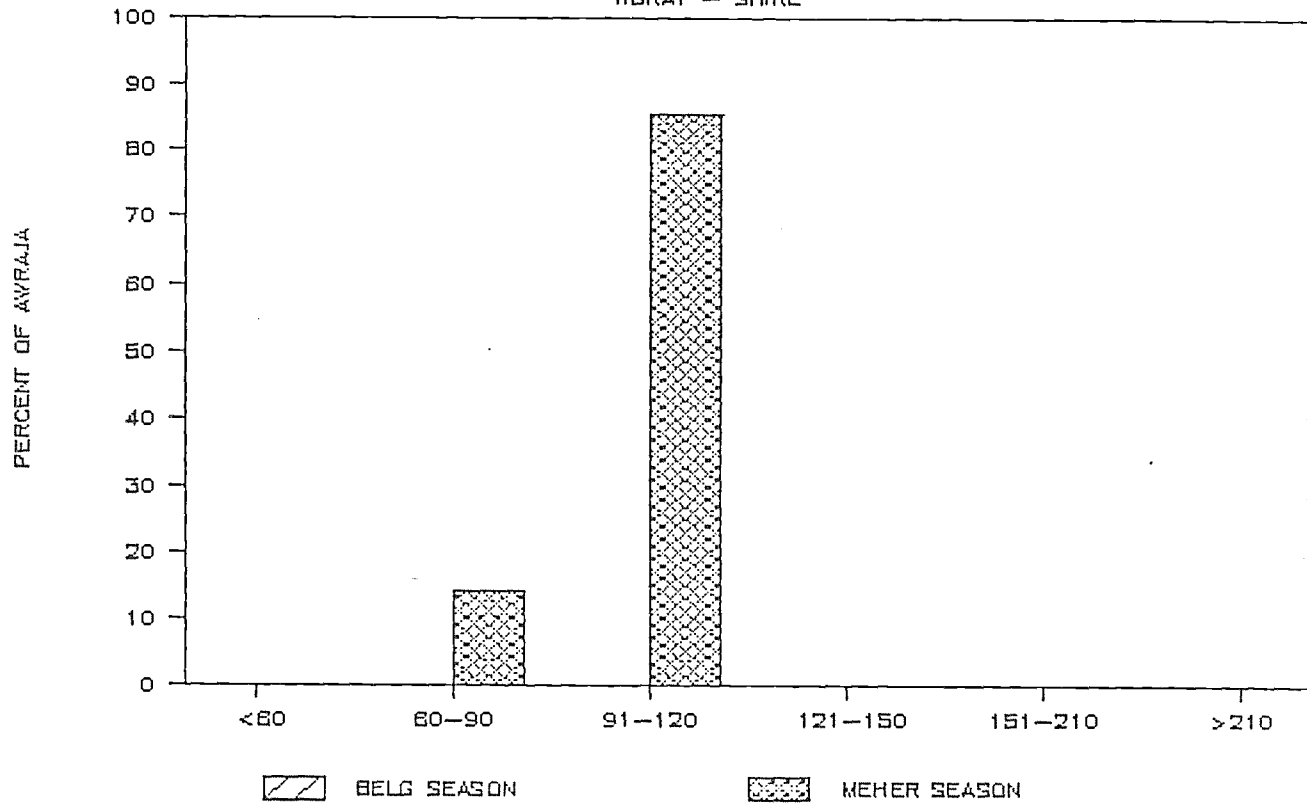
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TIGRAY — AXJUM



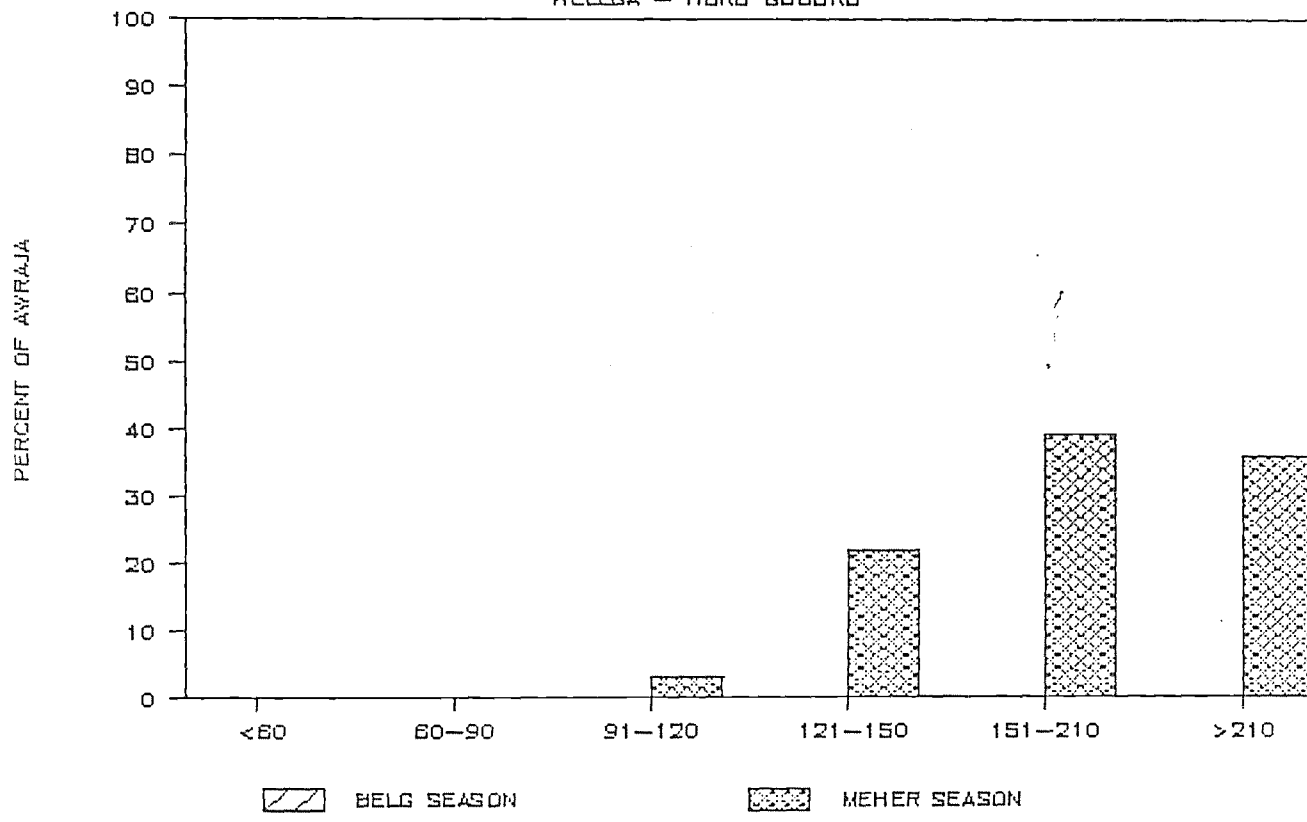
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TIGRAY - SHIRE



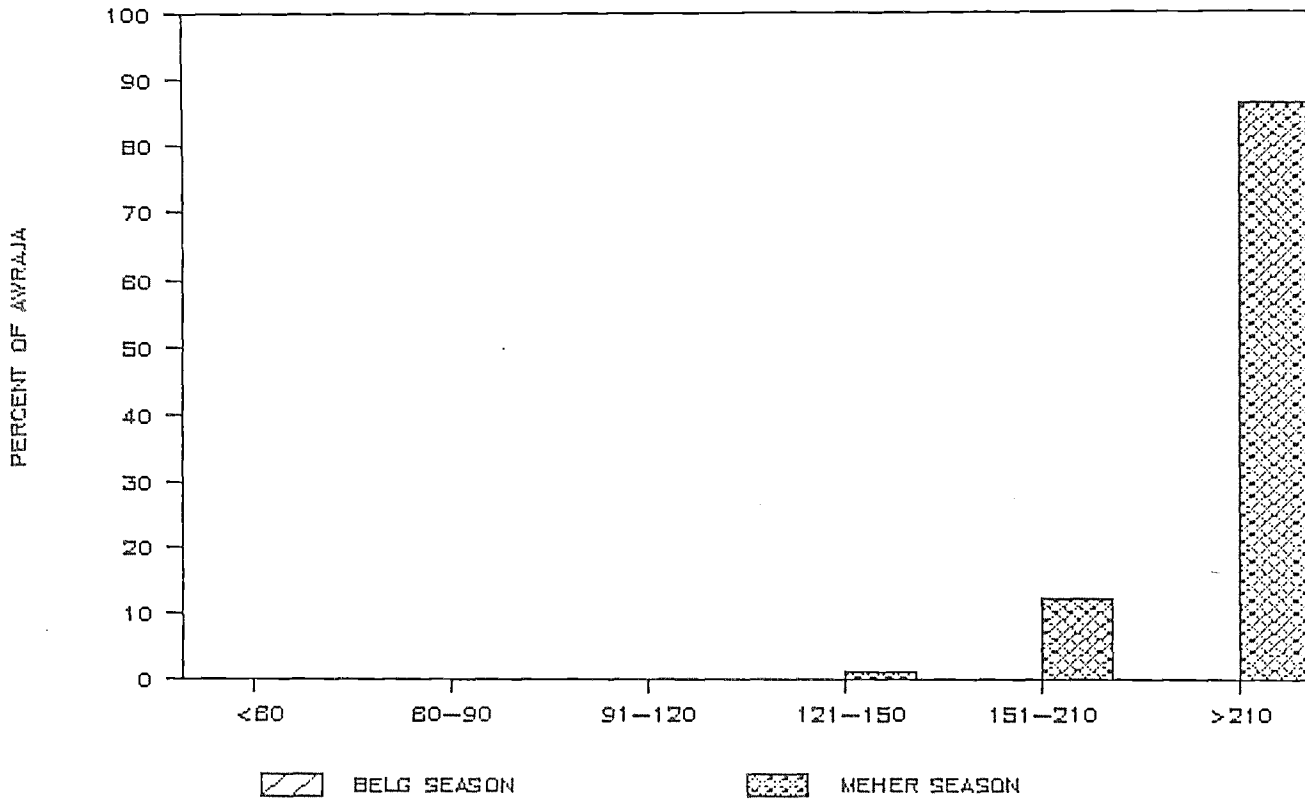
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WELEGA - HORO GUDURU



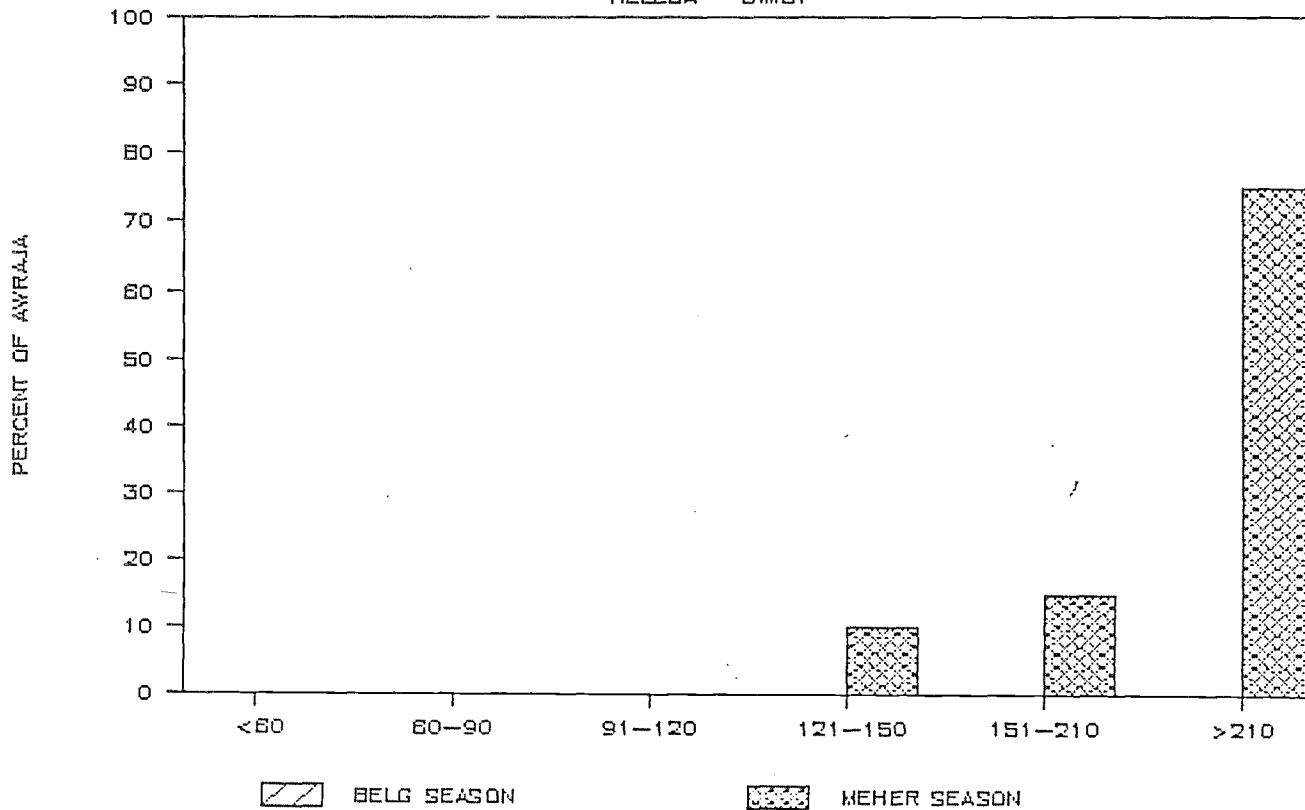
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WELEGA - ARJO



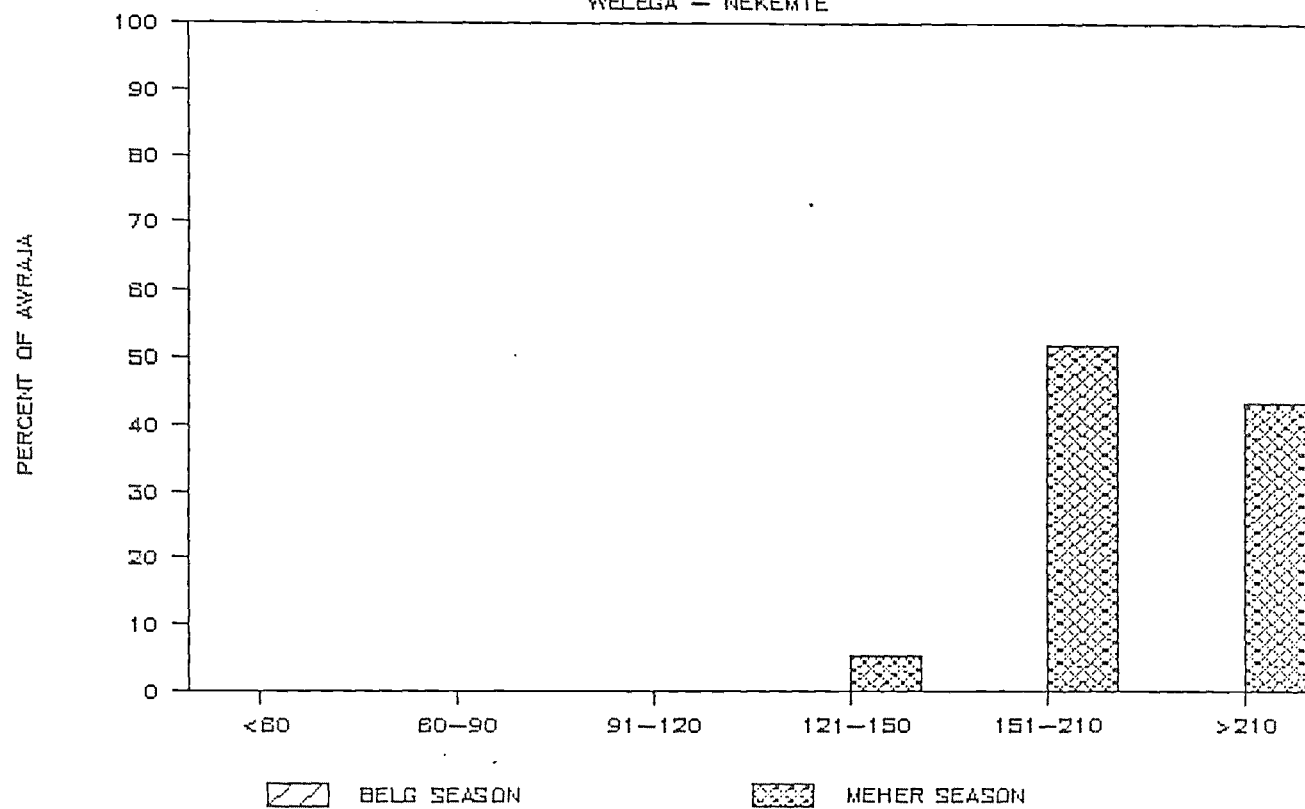
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WELEGA - GIMBI



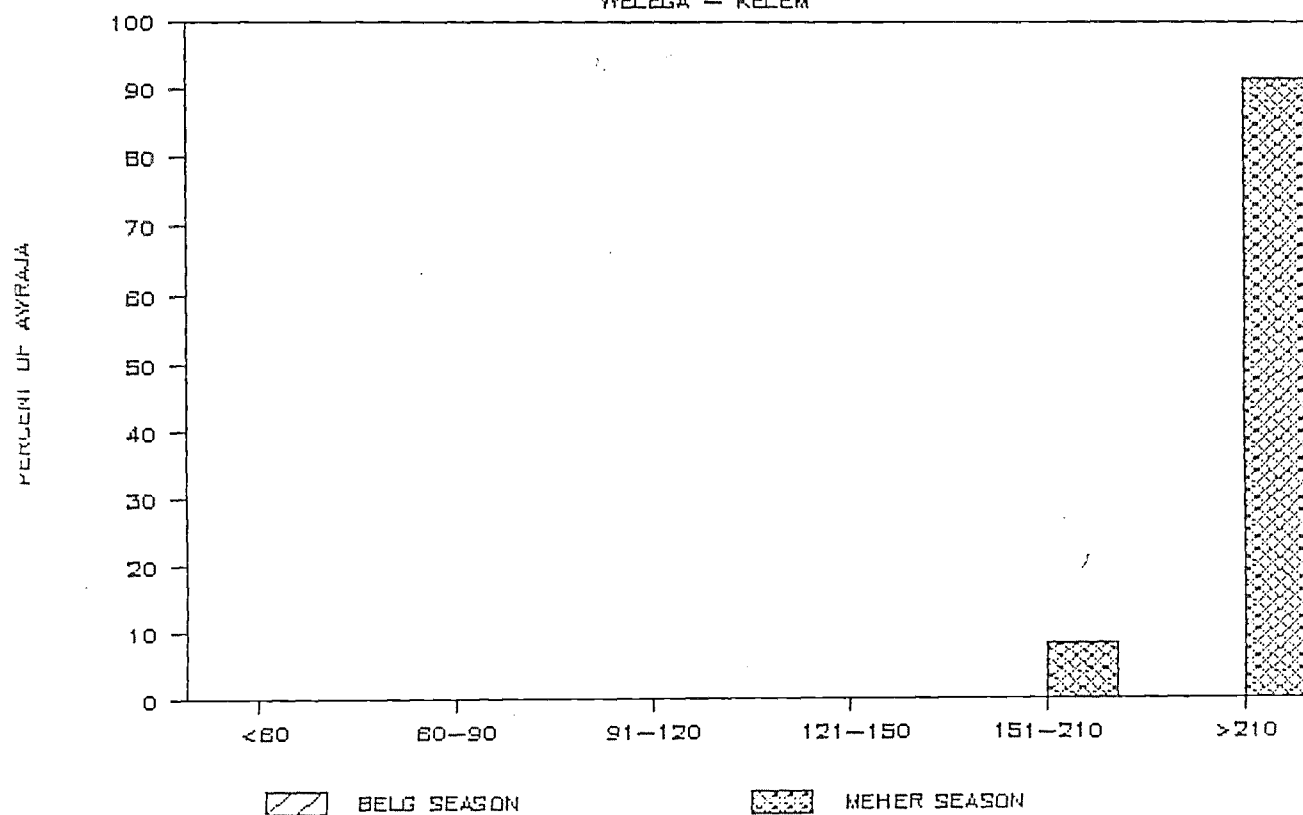
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WELEGA — NEKEMTE



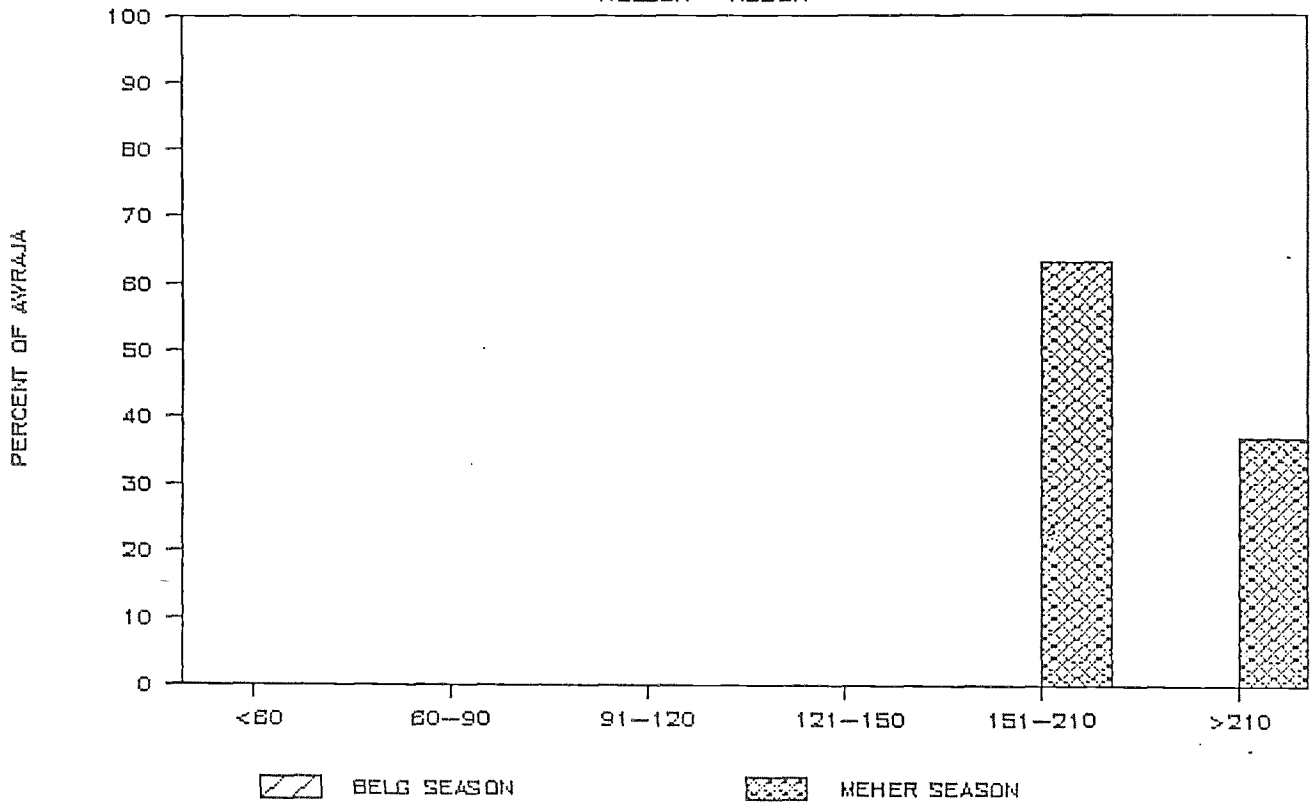
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WELEGA — KELEM



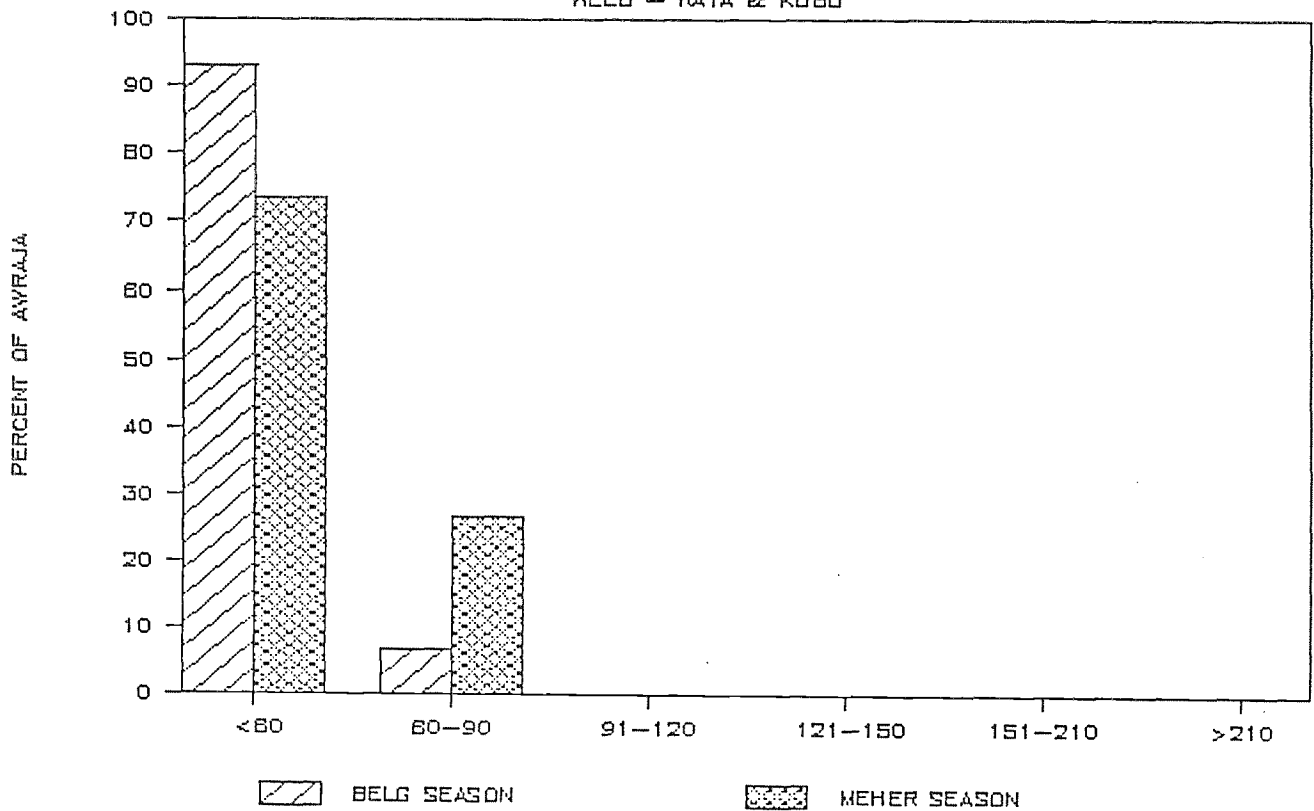
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WELEGA — ASOSA



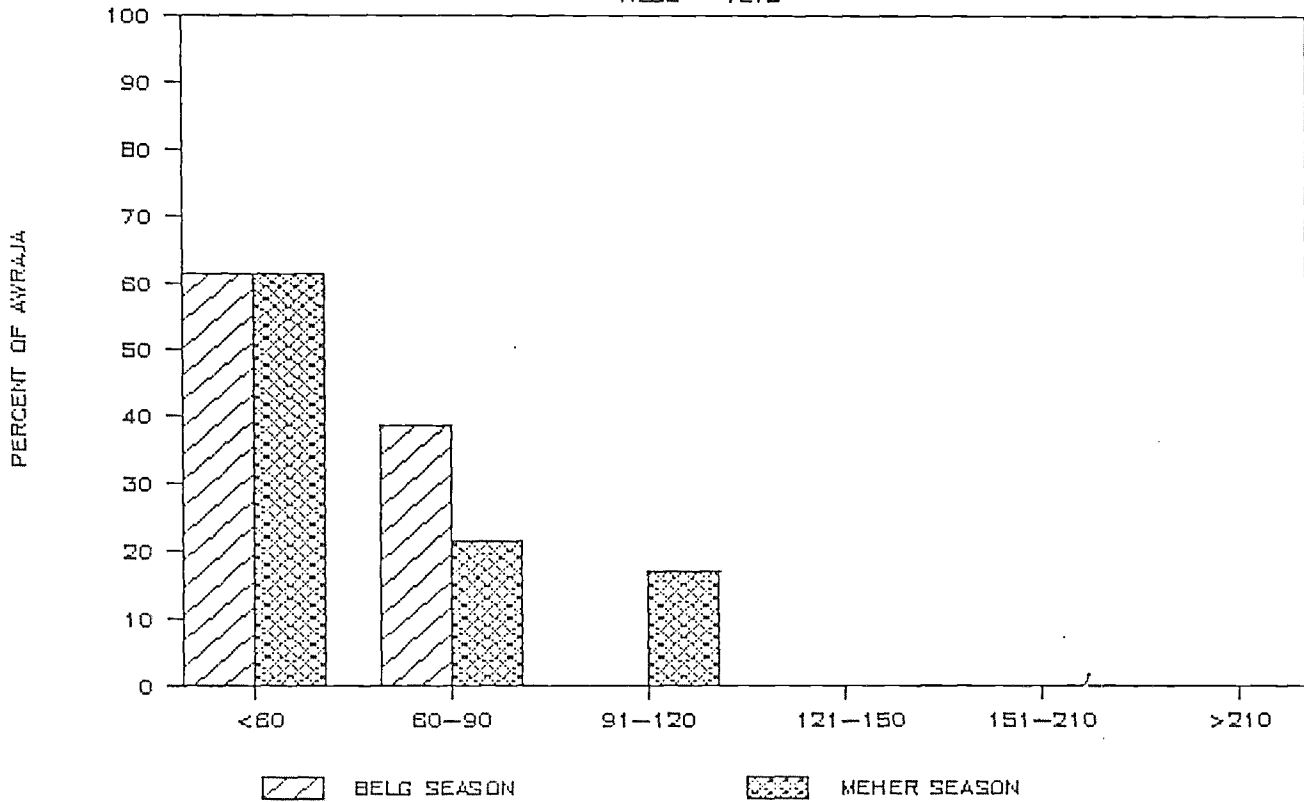
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WELO — RAYA & KORO



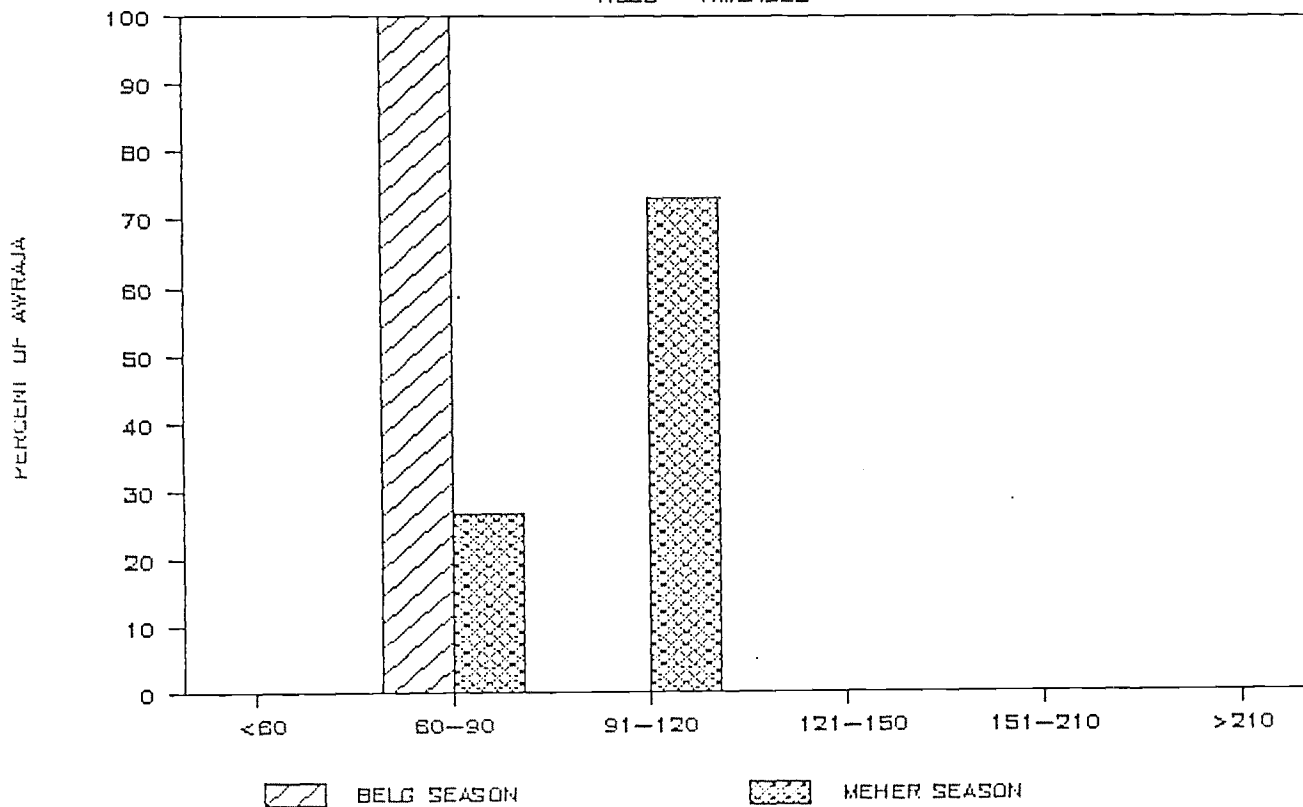
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WELD — YEJU



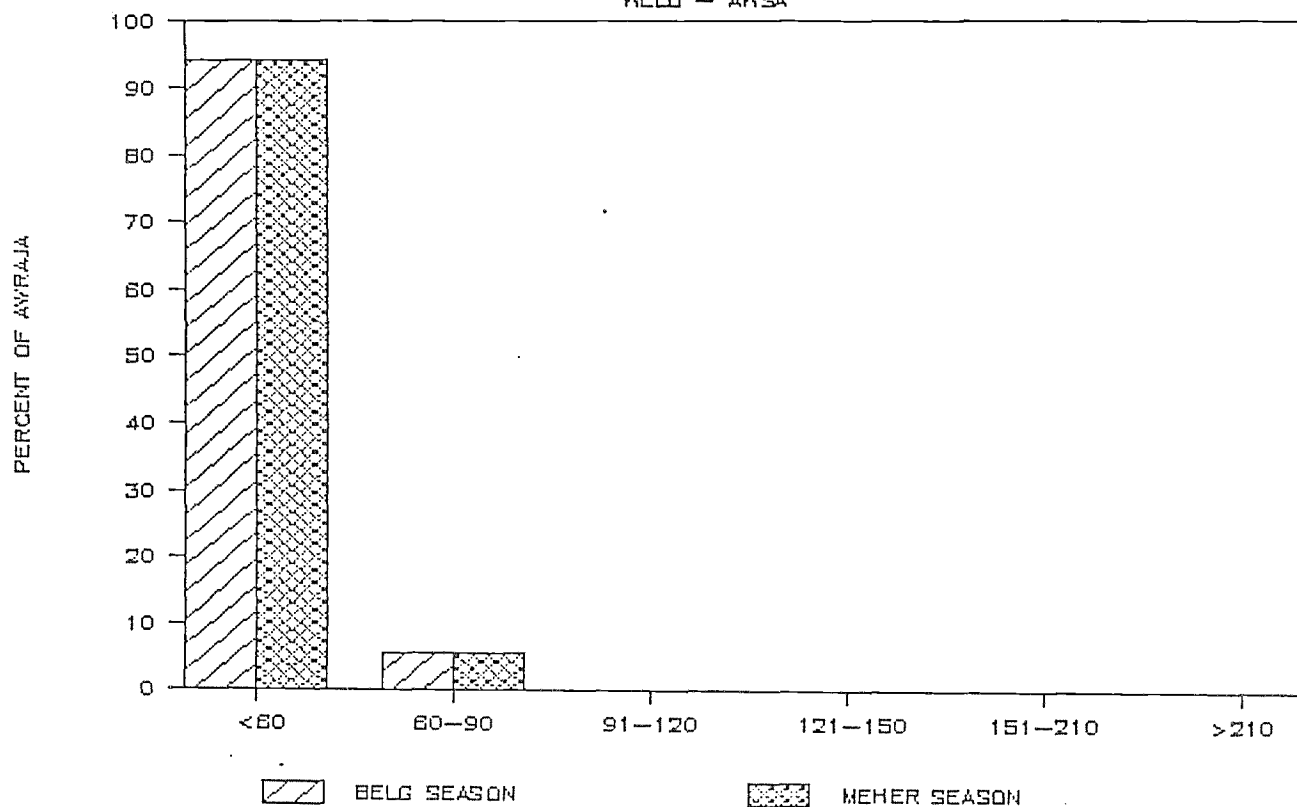
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WELD — AMBASEL



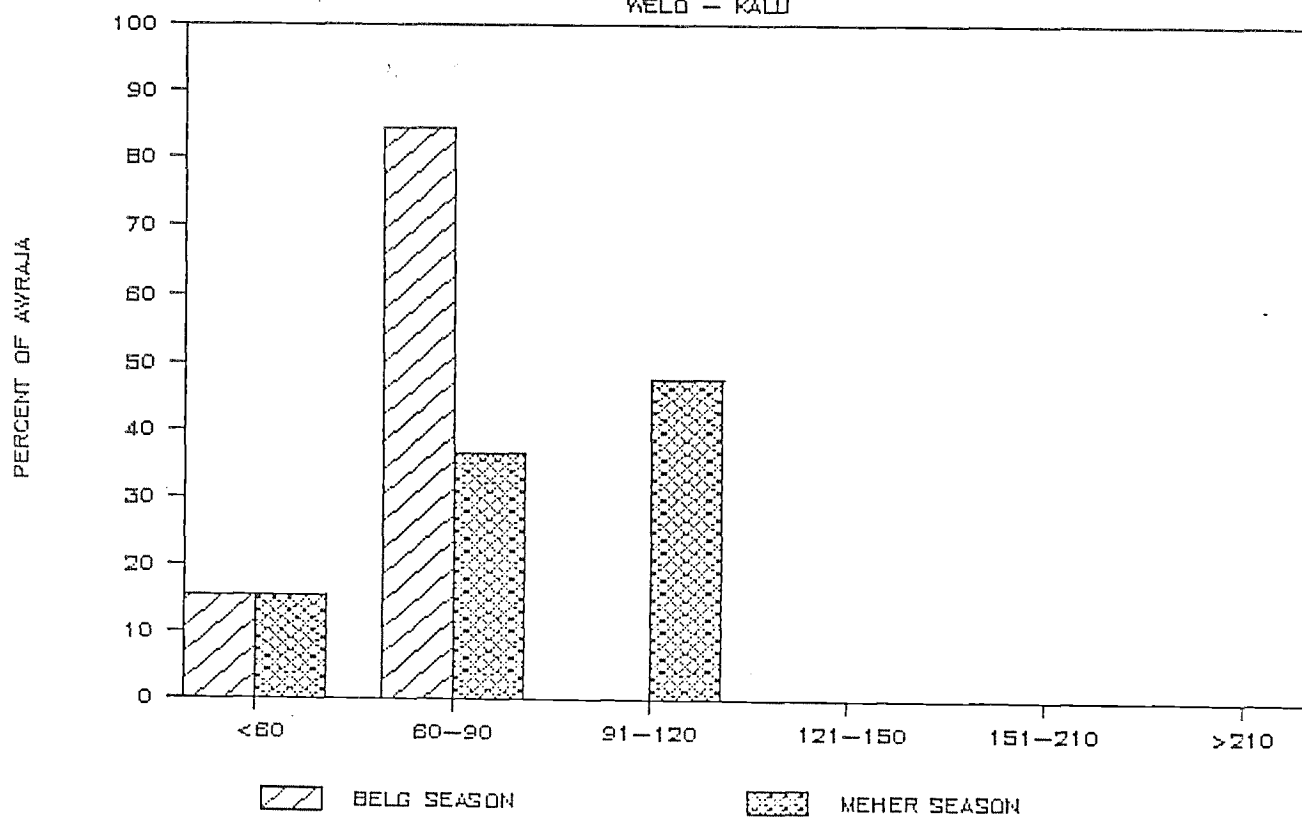
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WELD — AWSA



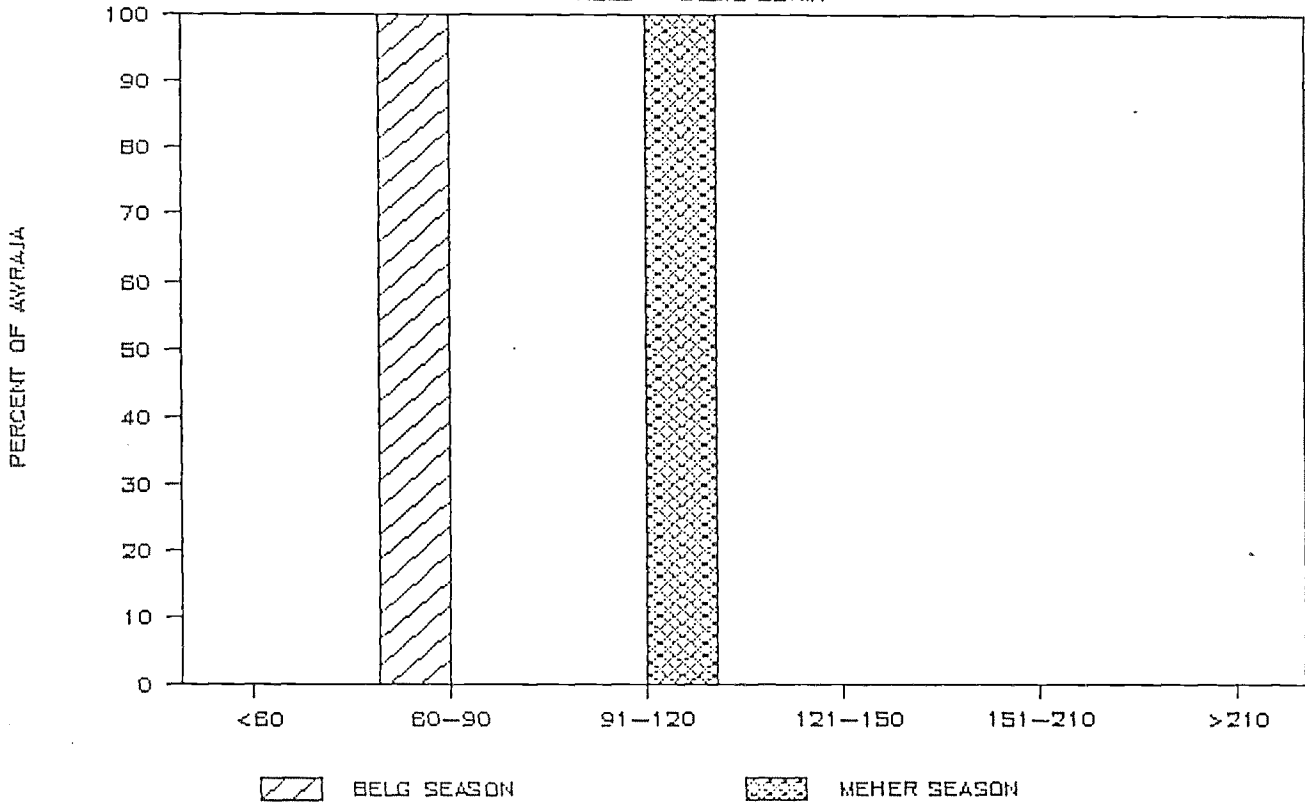
DEPENDABLE GROWING PERIOD — DAYS

WELD — KALU



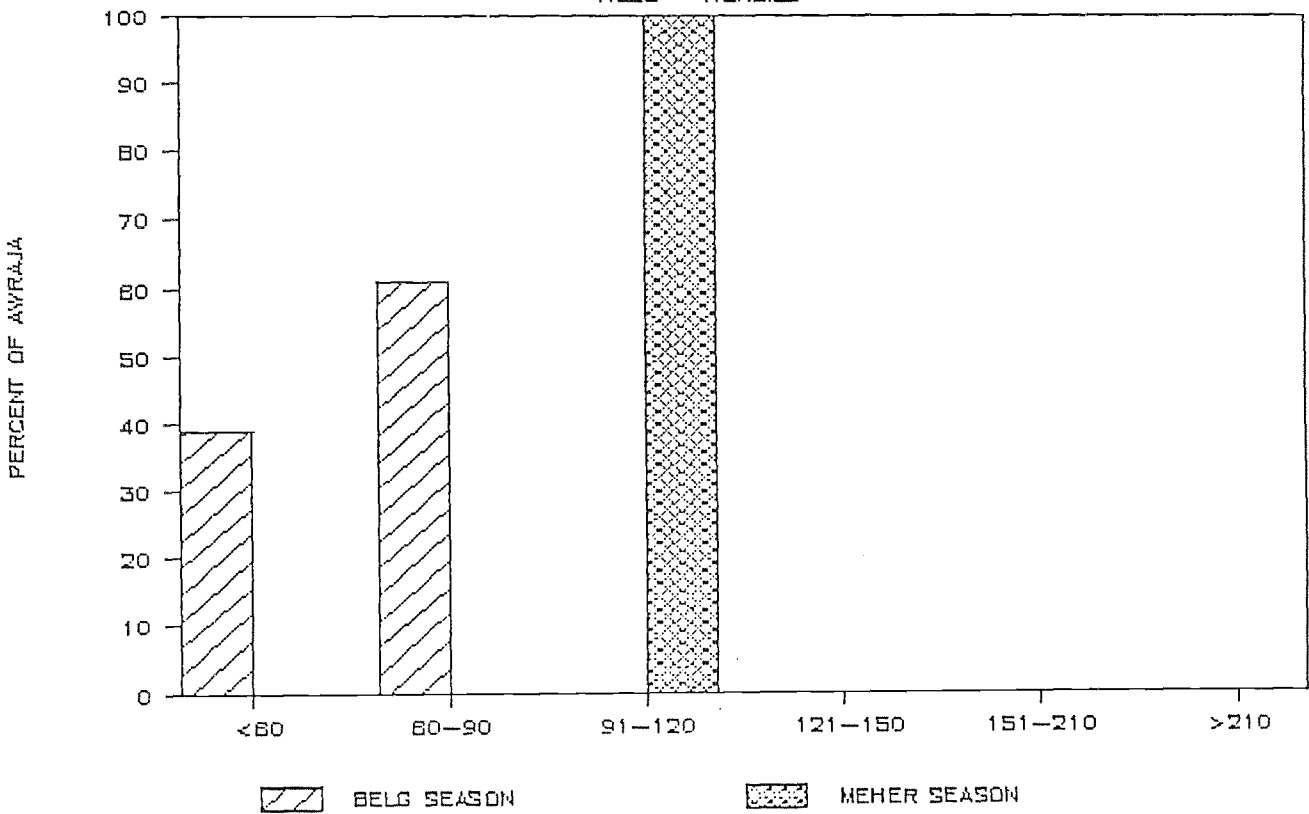
DEPENDABLE GROWING PERIOD - DAYS

WELD - DESIE ZURIA



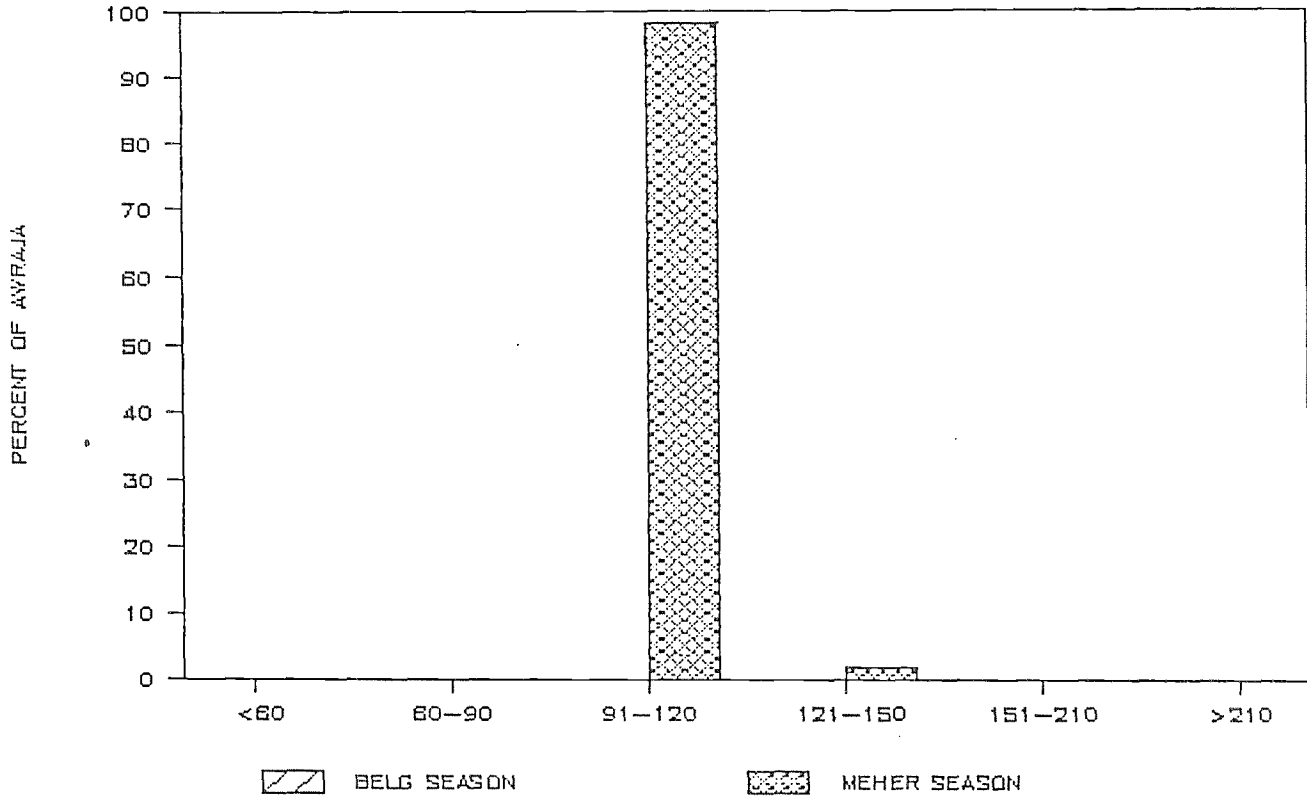
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WELD - WEREILLI



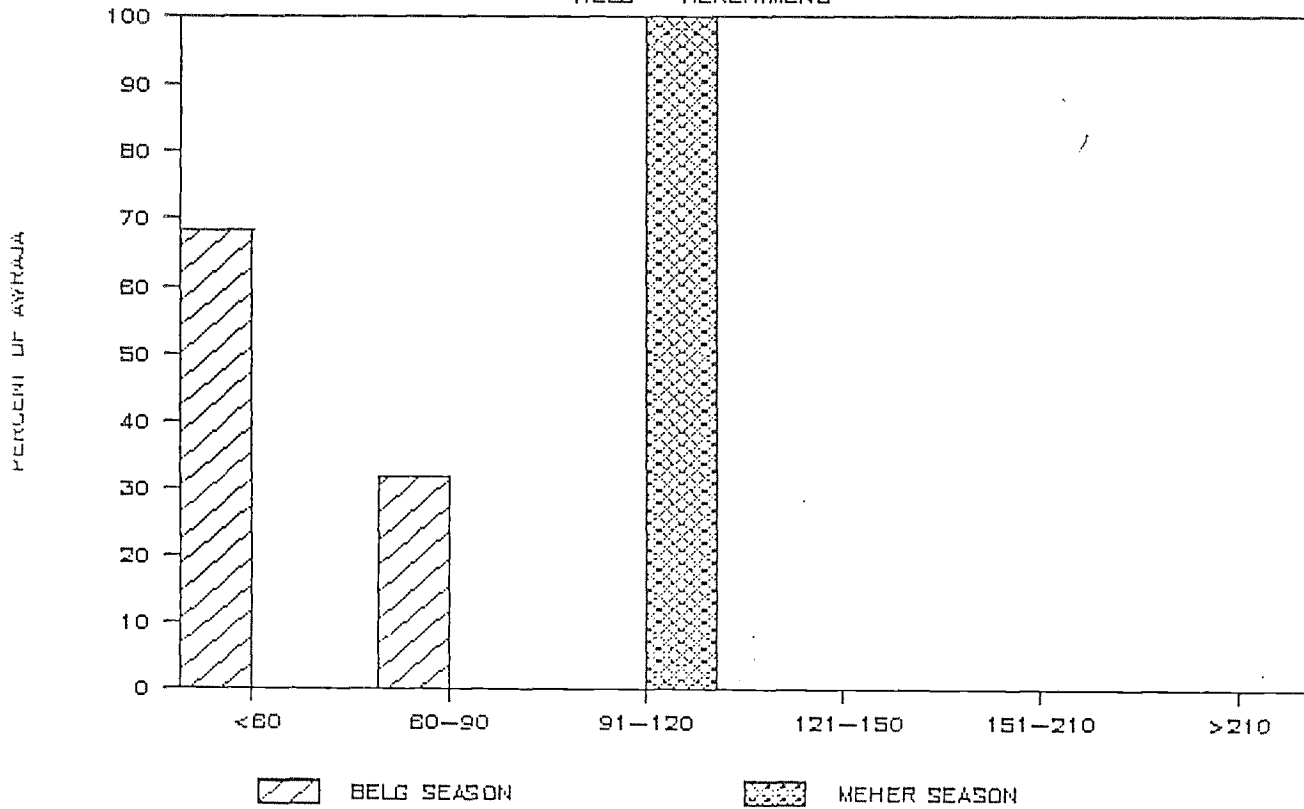
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WELD — BORENA



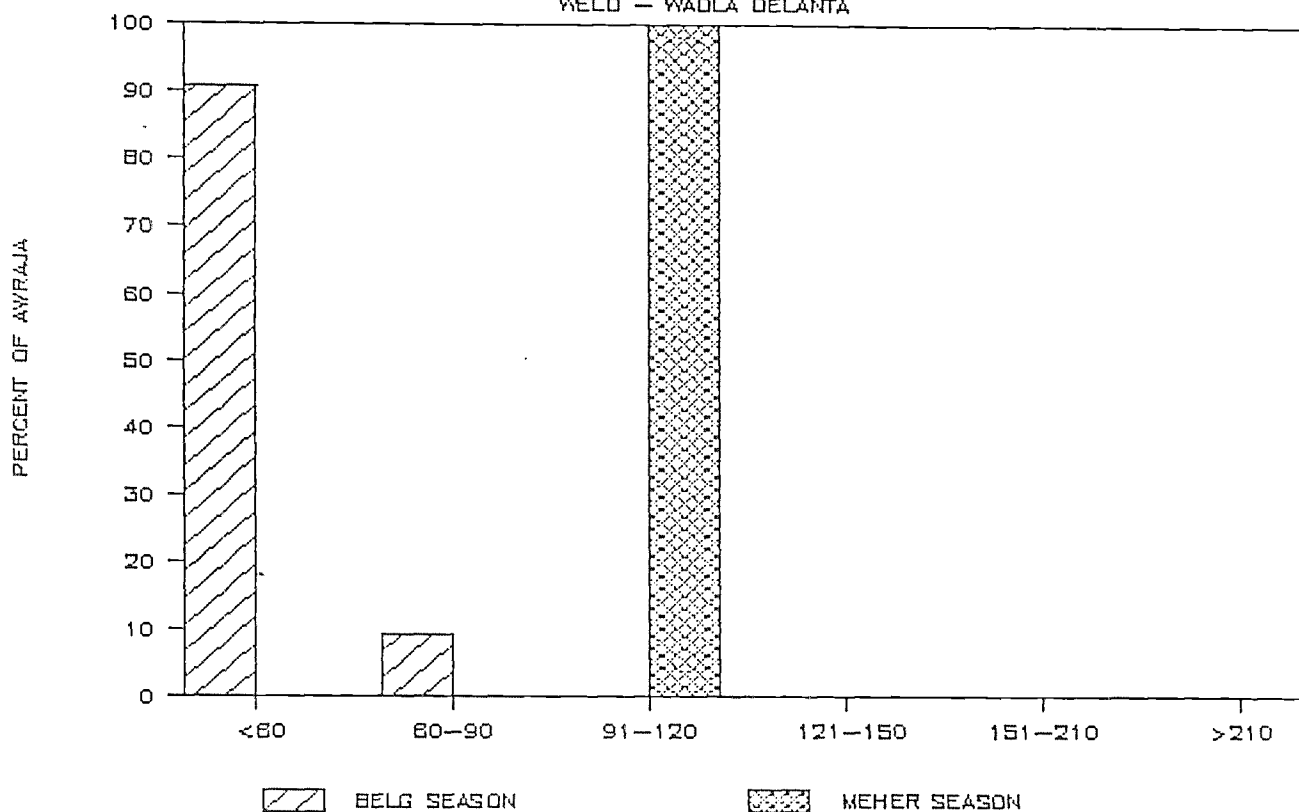
DEPENDABLE GROWING PERIOD — DAYS

WELD — WEREHIMENO



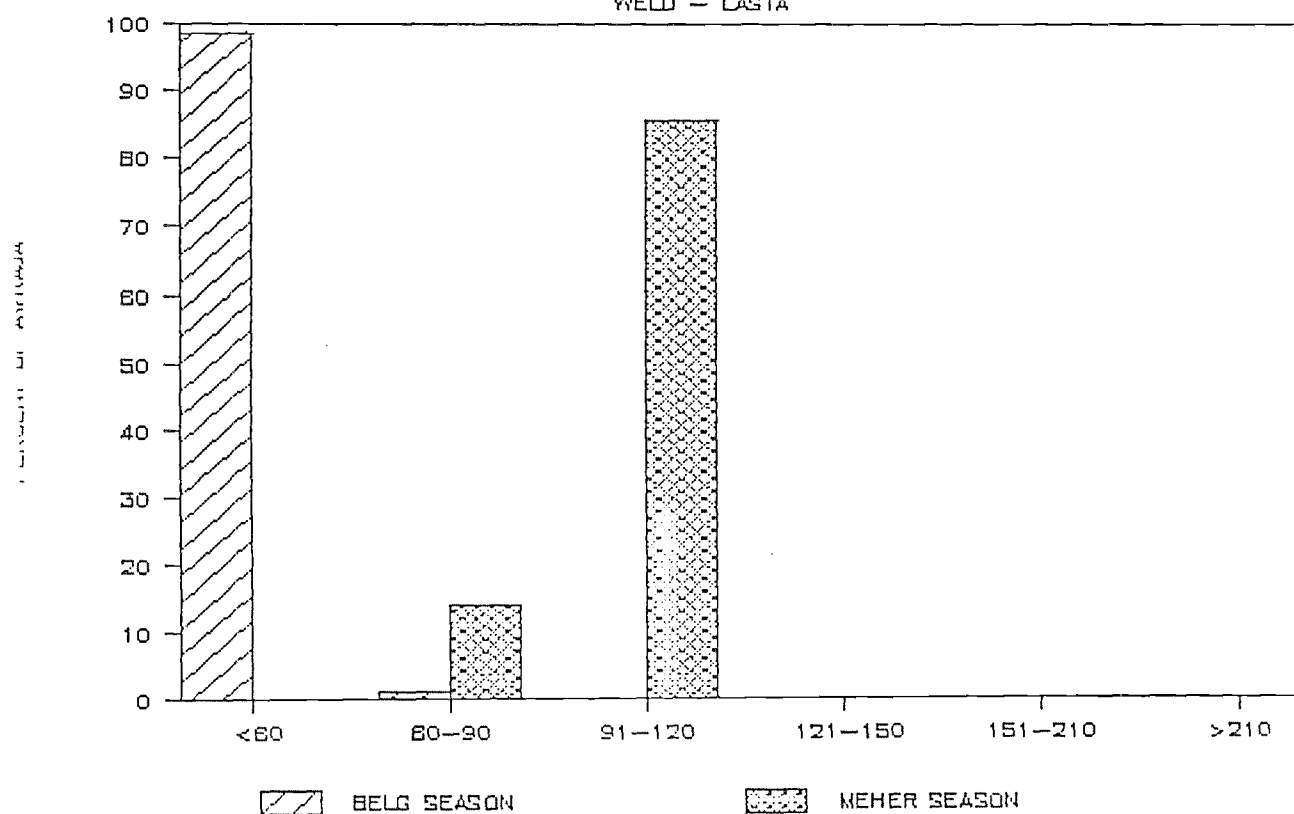
DEPENDABLE GROWING PERIOD — DAYS

WELD — WADLA DELANTA



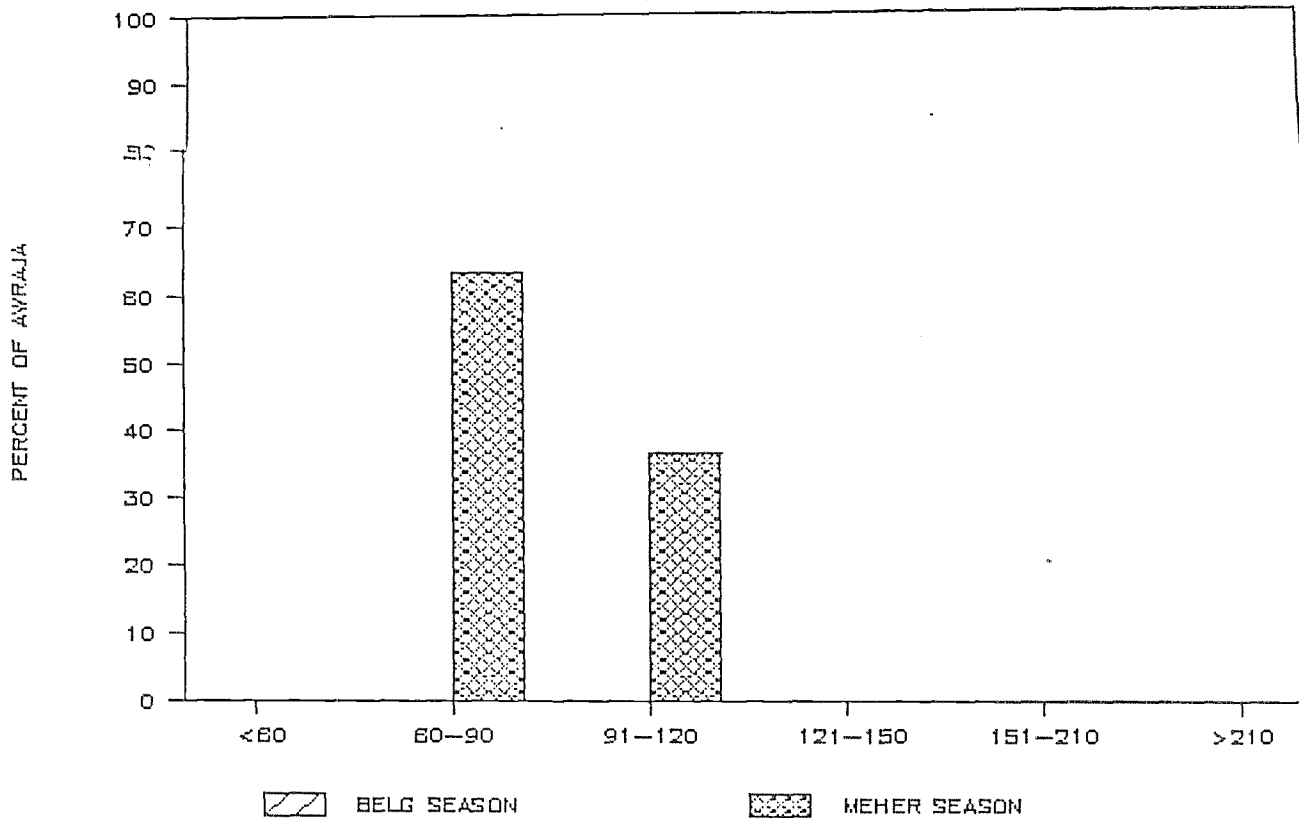
DEPENDABLE GROWING PERIOD — DAYS

WELD — LASTA



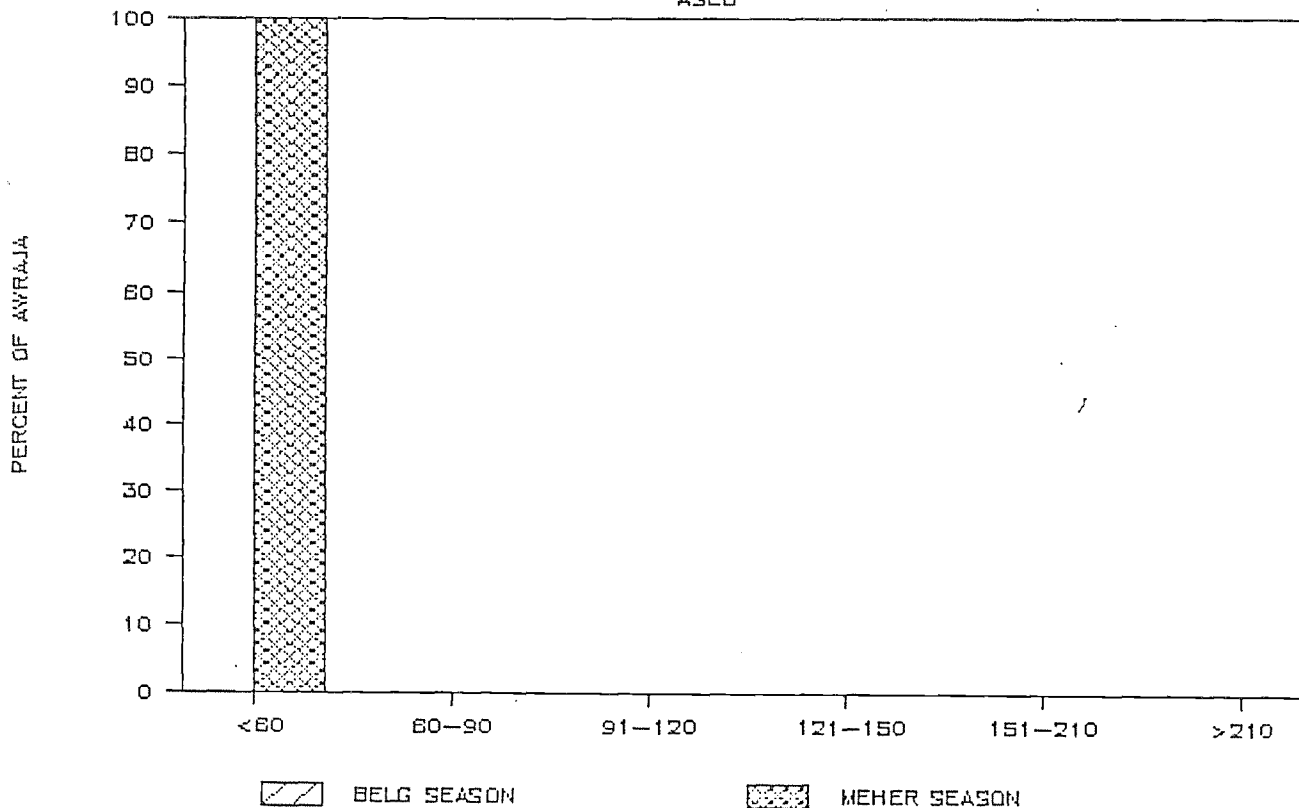
DEPENDABLE GROWING PERIOD - DAYS

WELD - WAG



DEPENDABLE GROWING PERIOD - DAYS

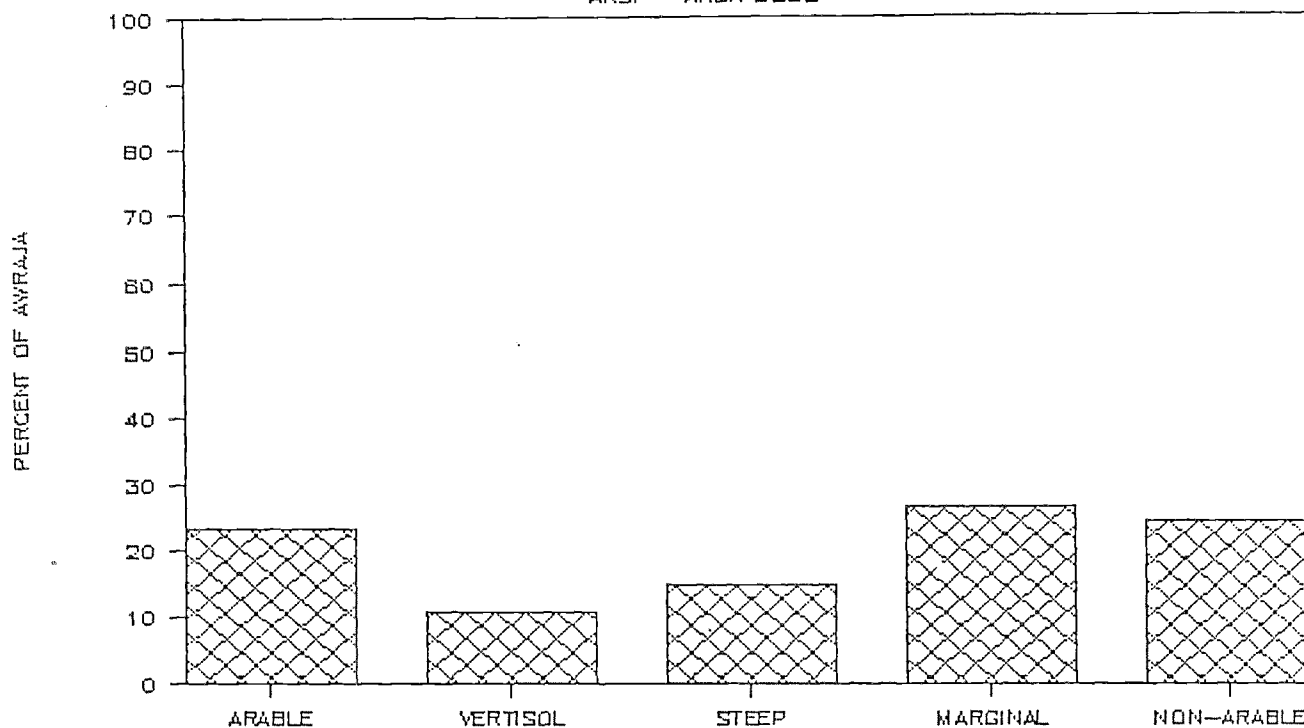
ASEB



LAND MANAGEMENT CLASSES

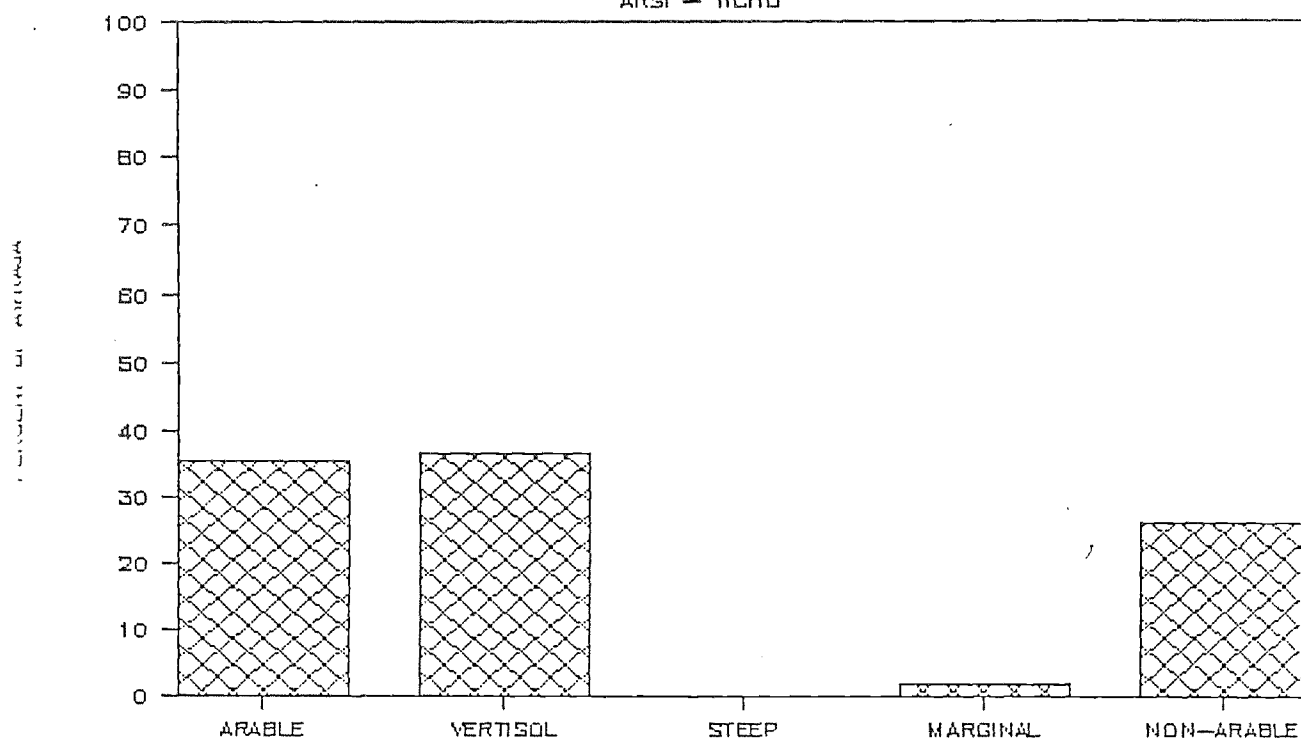
LAND MANAGEMENT CLASSES

ARSI - ARBA GUGU



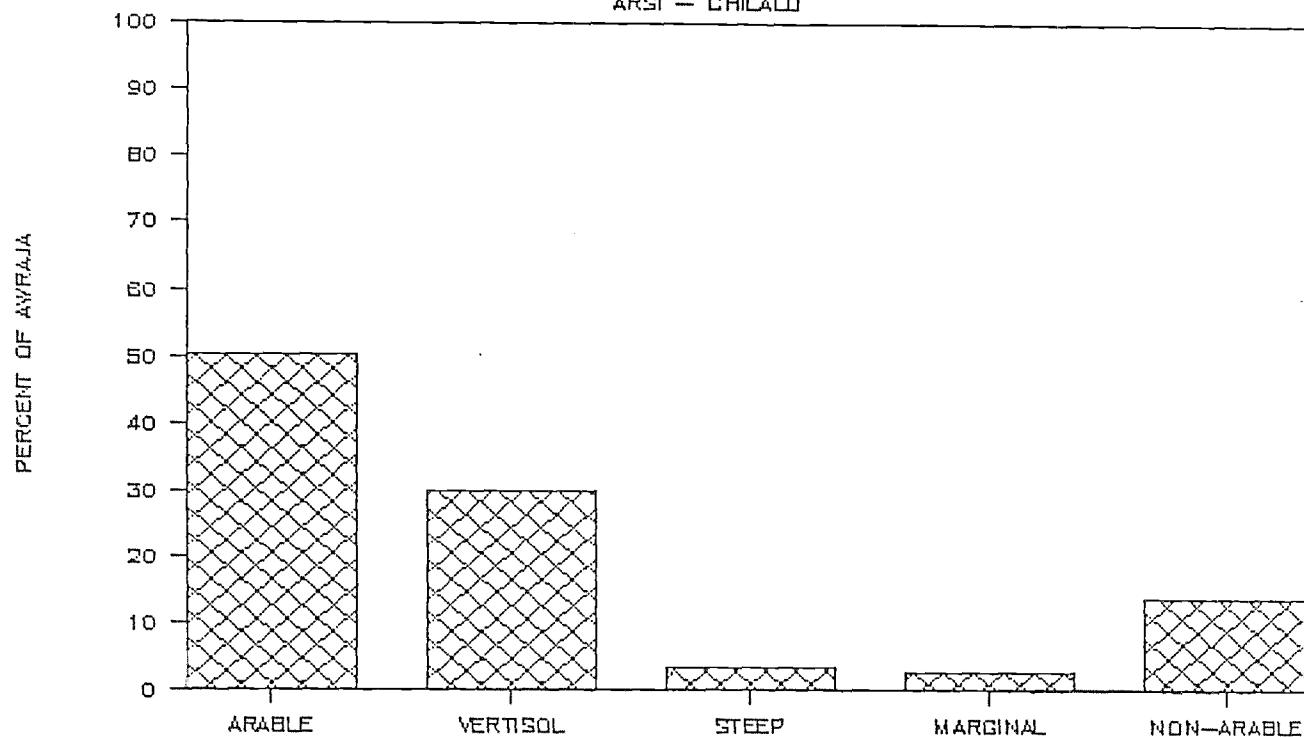
LAND MANAGEMENT CLASSES

ARSI - TICHO



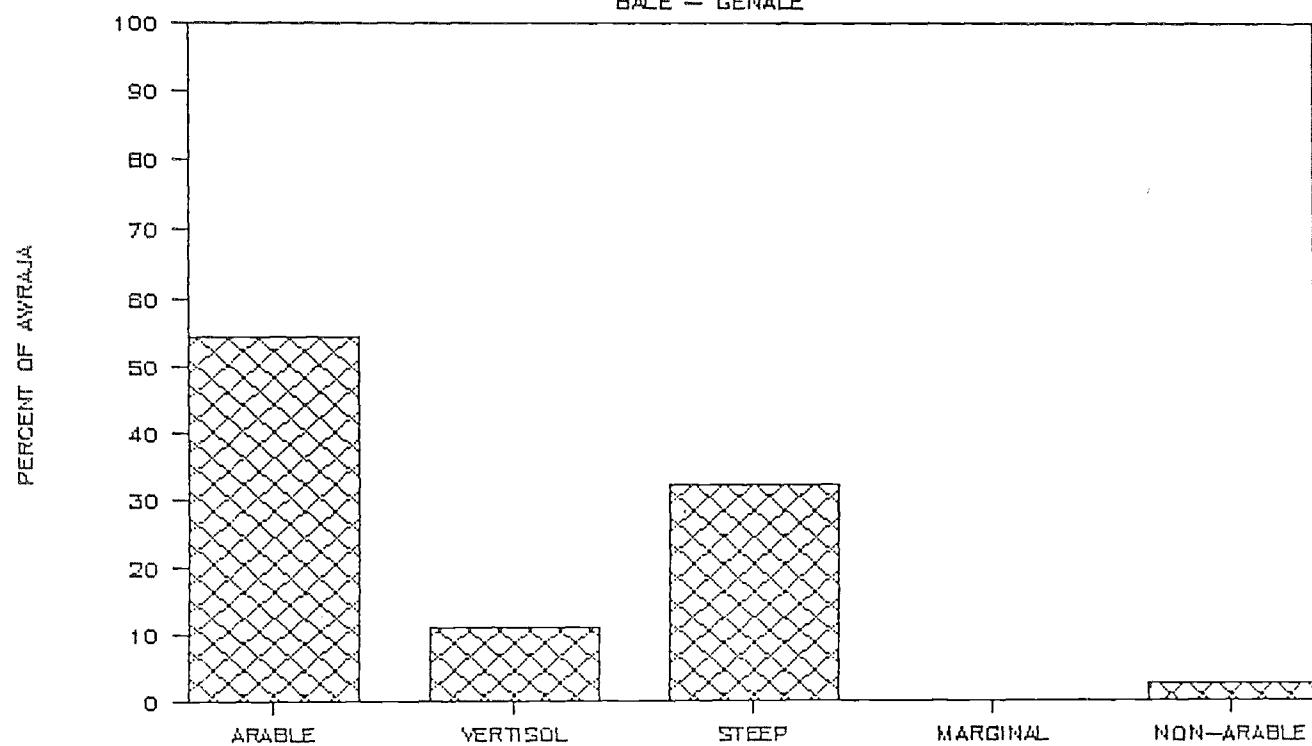
LAND MANAGEMENT CLASSES

ARSI - CHILALO



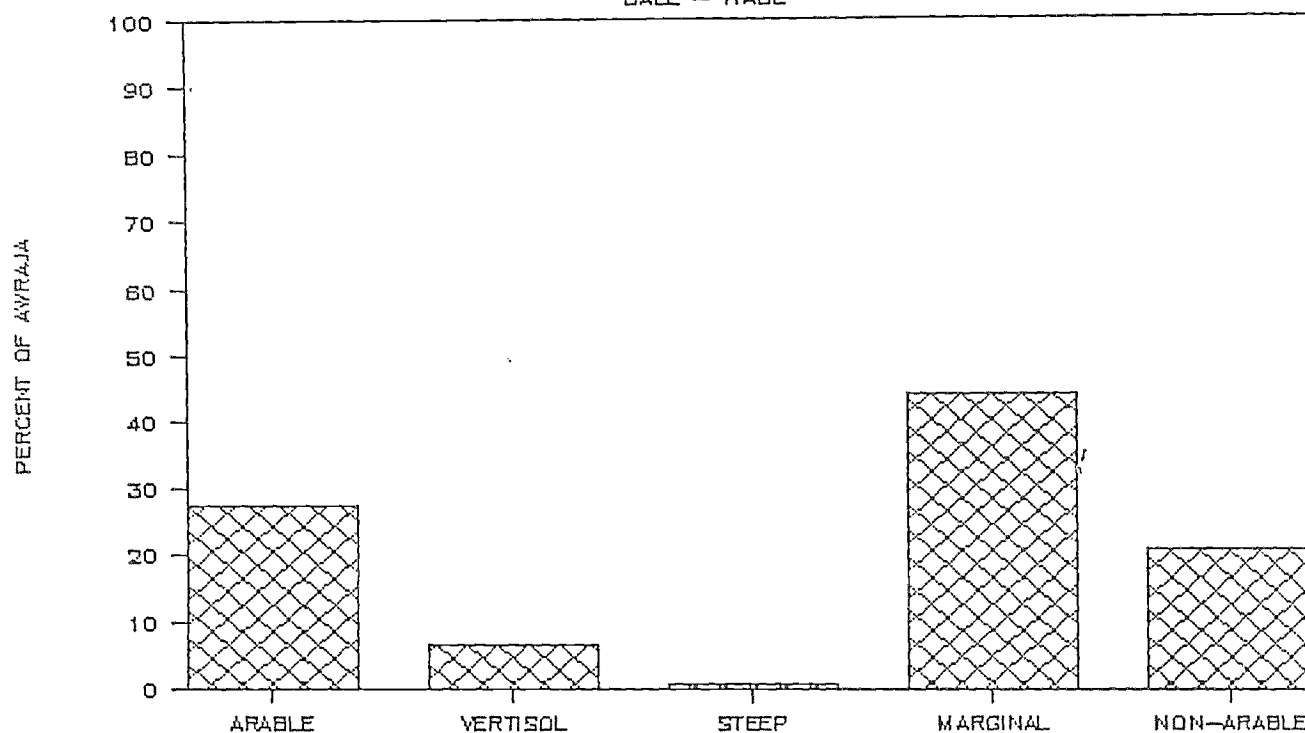
LAND MANAGEMENT CLASSES

BALE - GENALE



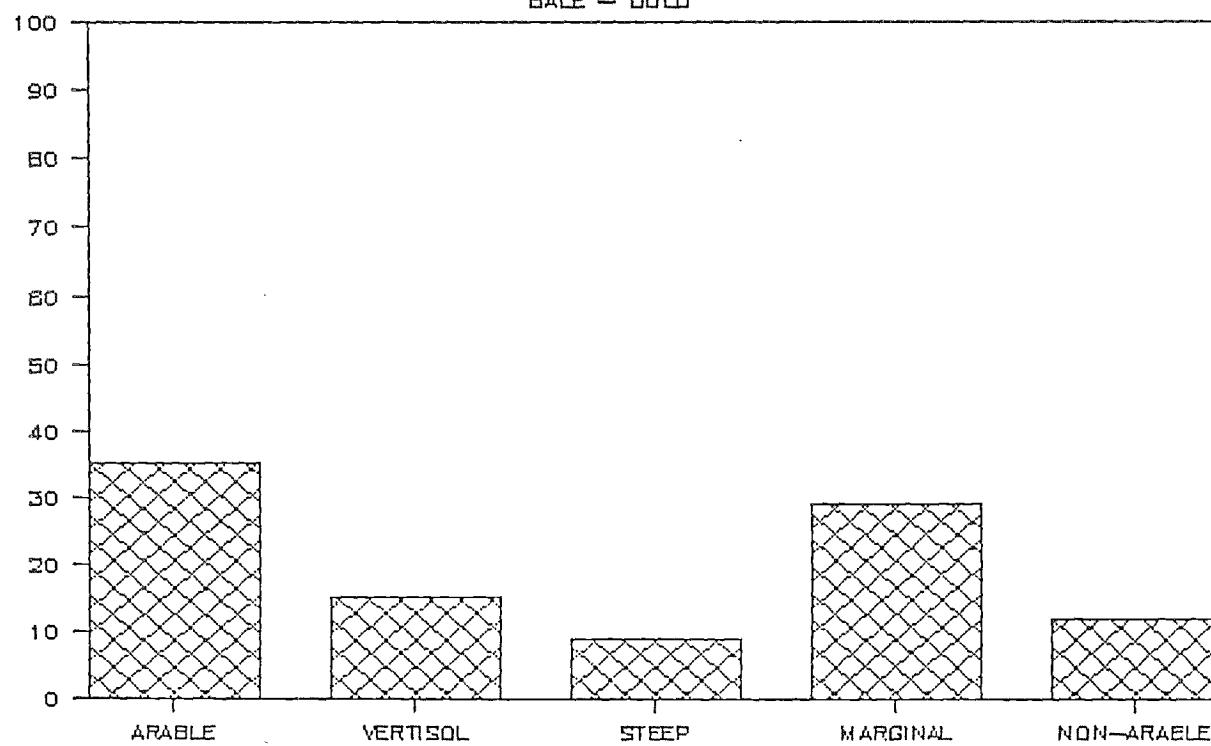
LAND MANAGEMENT CLASSES

BALE - WABE



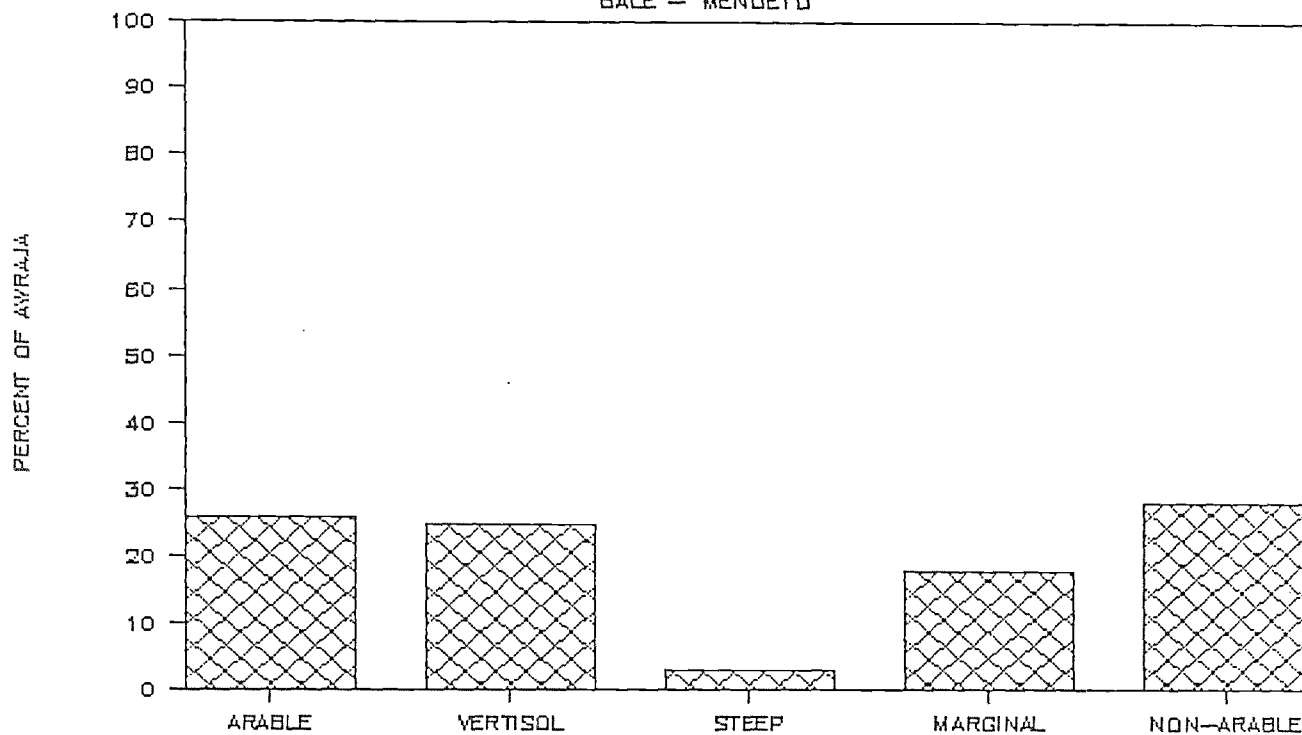
LAND MANAGEMENT CLASSES

BALE - DOLA



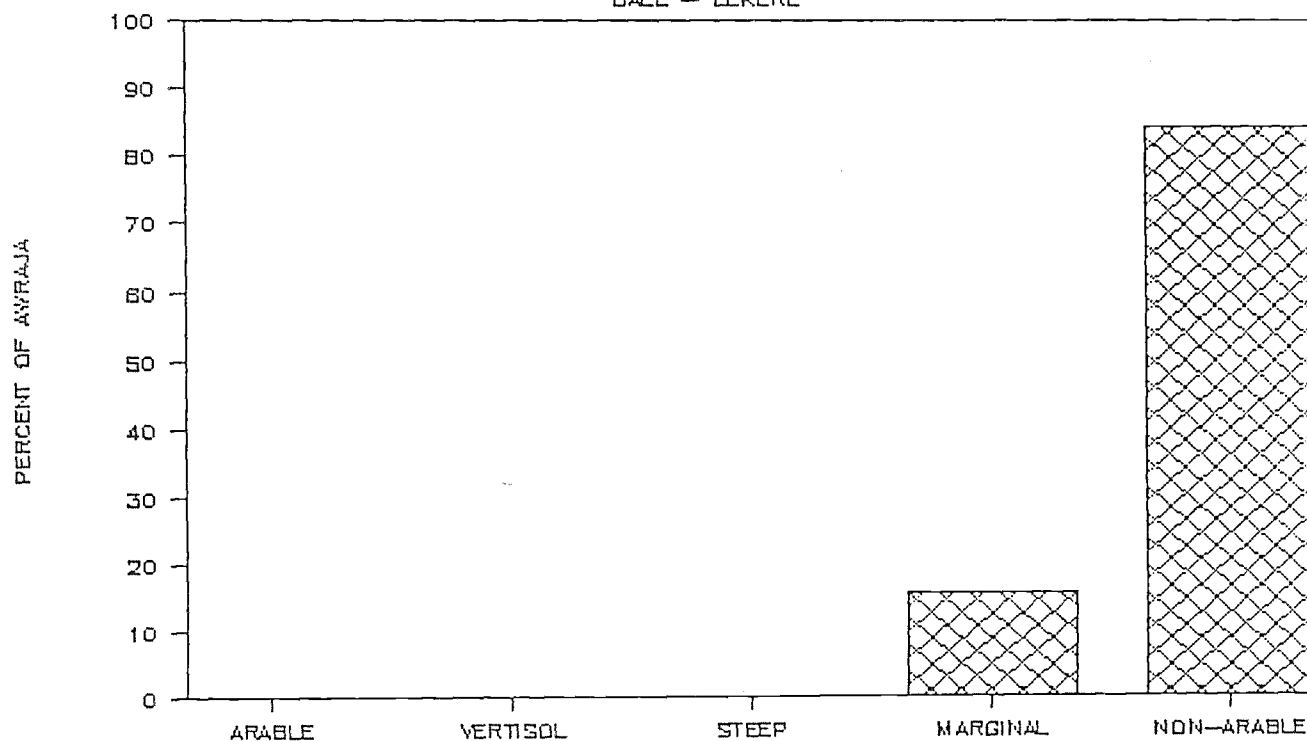
LAND MANAGEMENT CLASSES

BALE - MENDEYO



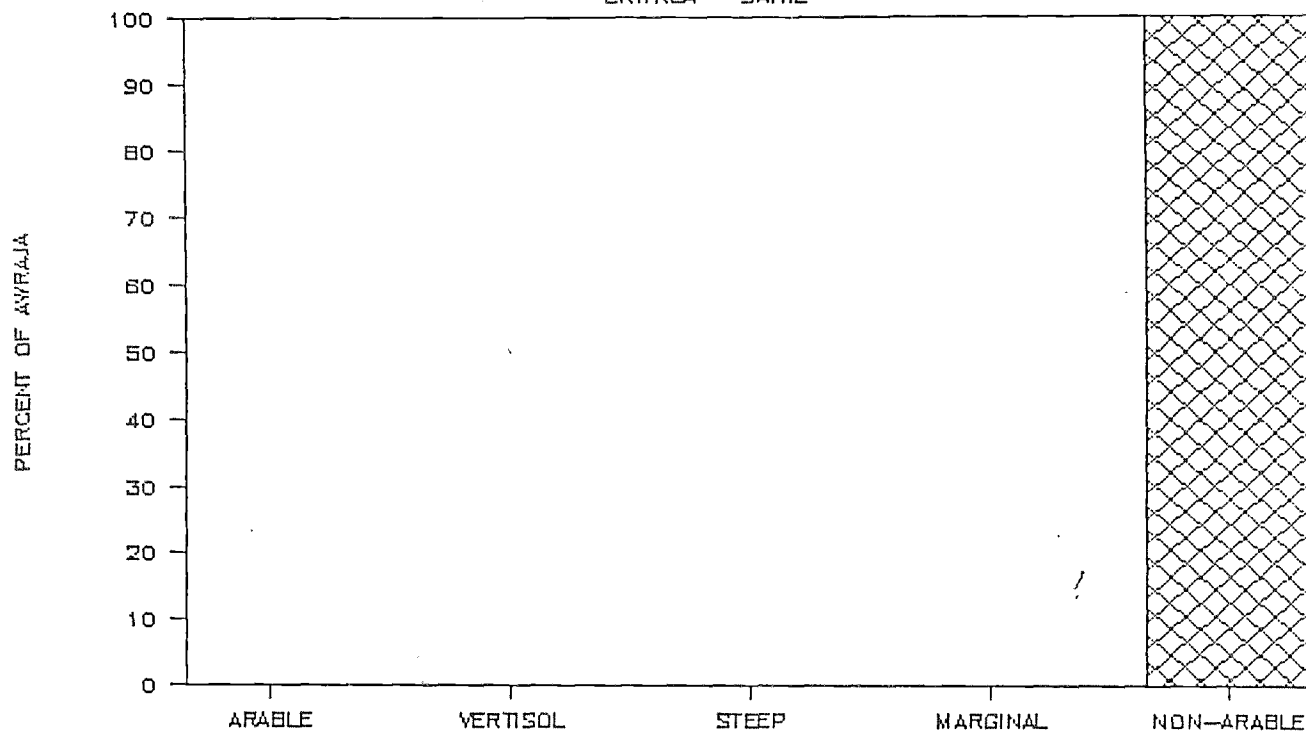
LAND MANAGEMENT CLASSES

BALE - ELKERE



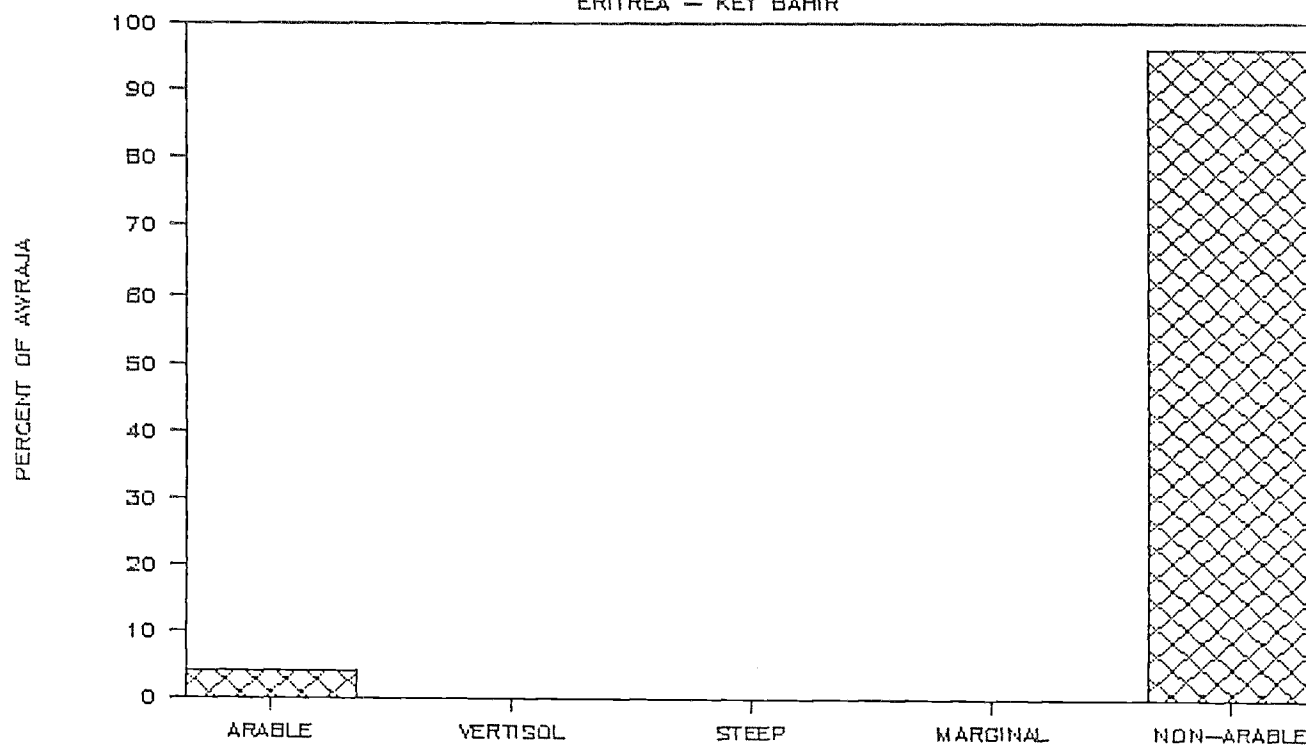
LAND MANAGEMENT CLASSES

ERITREA — SAHIL



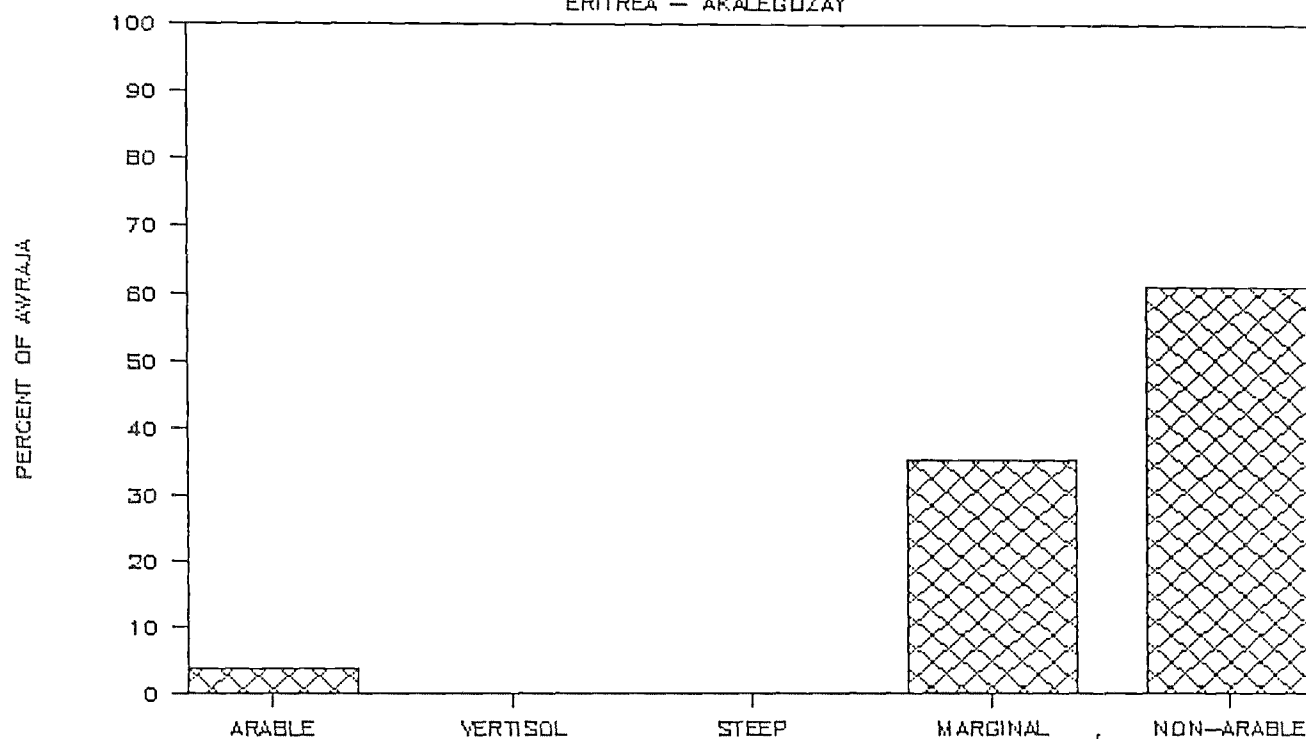
LAND MANAGEMENT CLASSES

ERITREA — KEY BAHIR



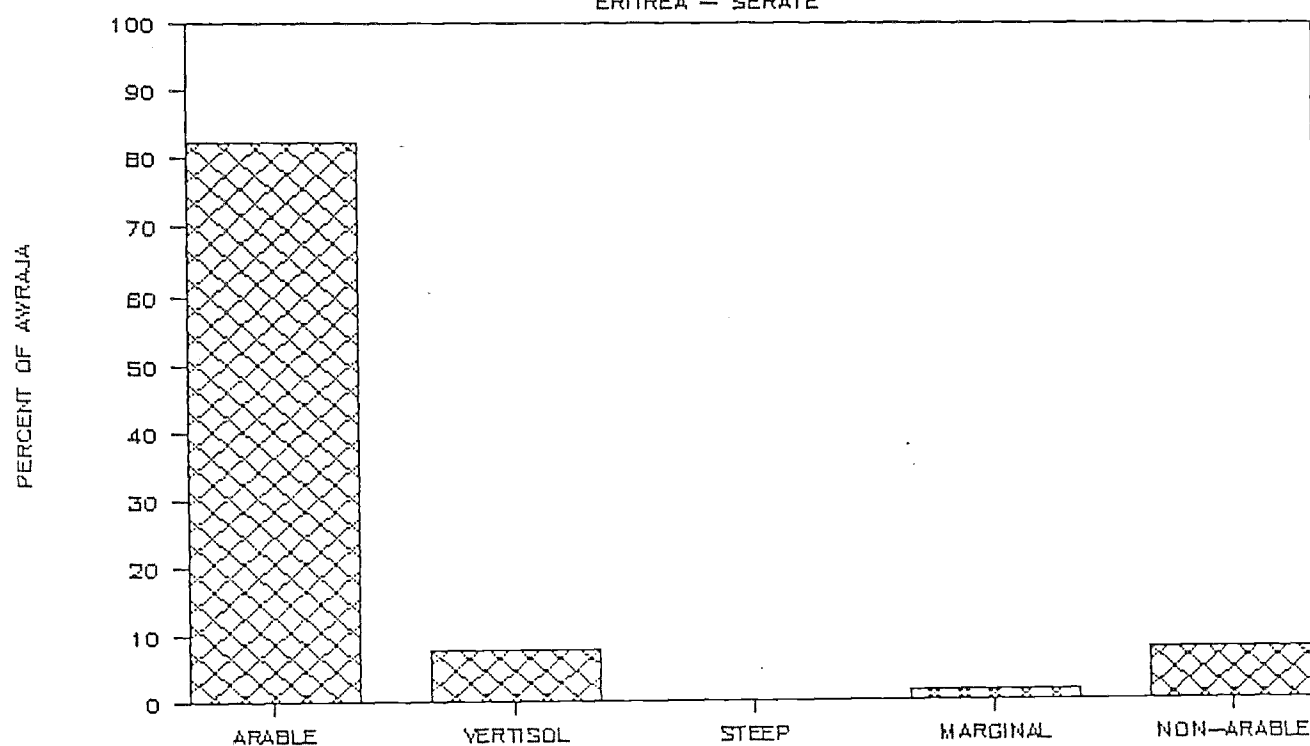
LAND MANAGEMENT CLASSES

ERITREA — AKALEGUZAY



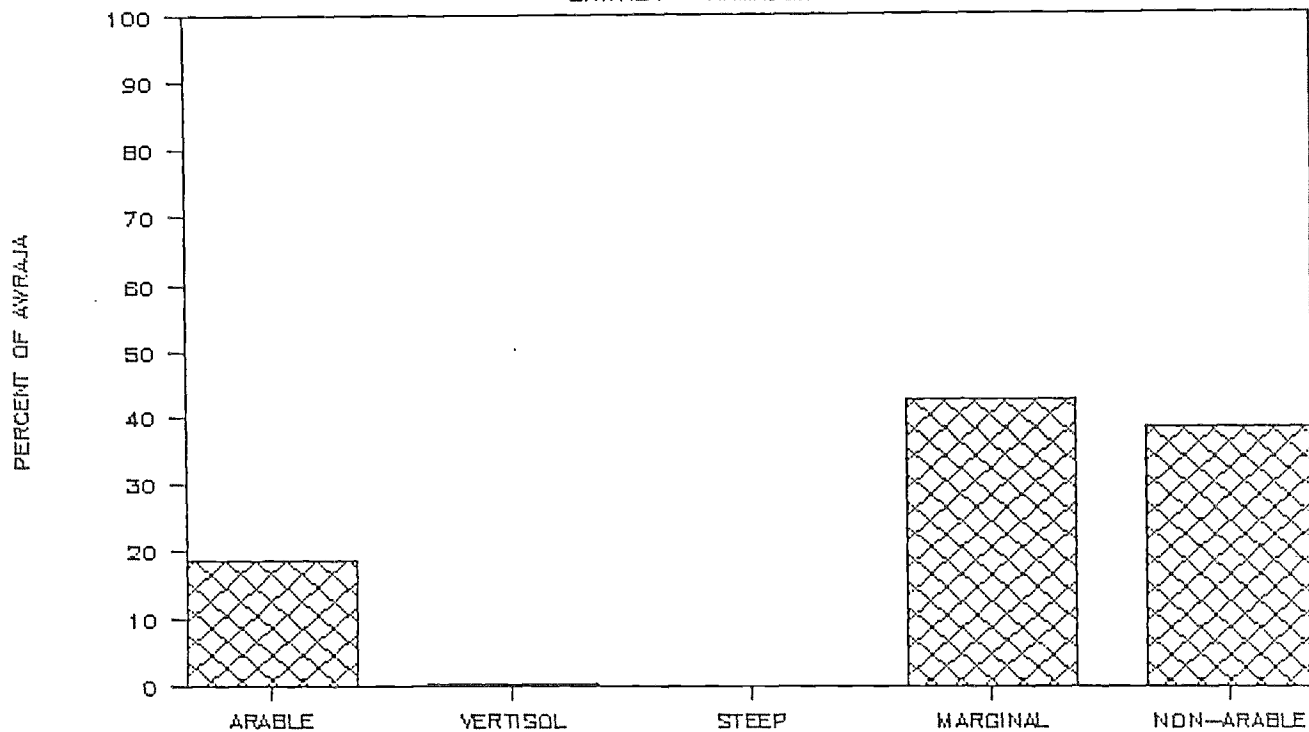
LAND MANAGEMENT CLASSES

ERITREA — SERAYE



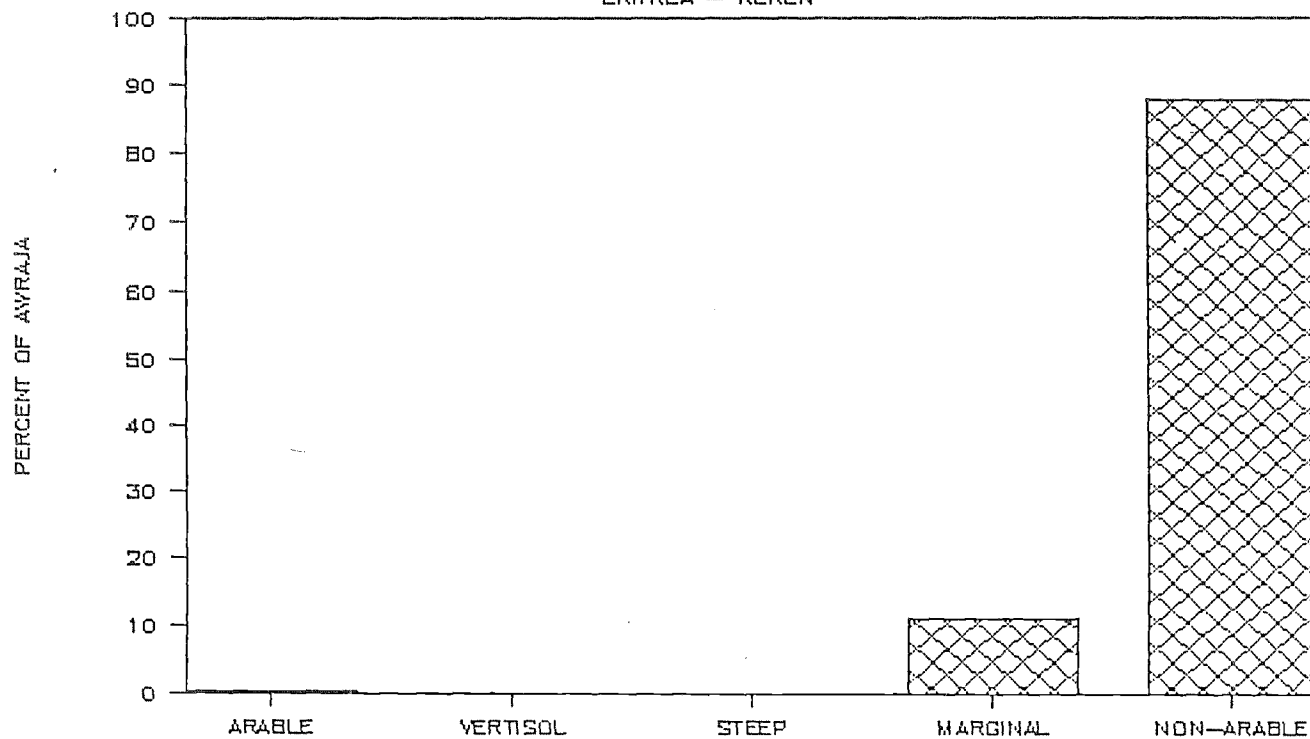
LAND MANAGEMENT CLASSES

ERITREA — HAMASSIEN



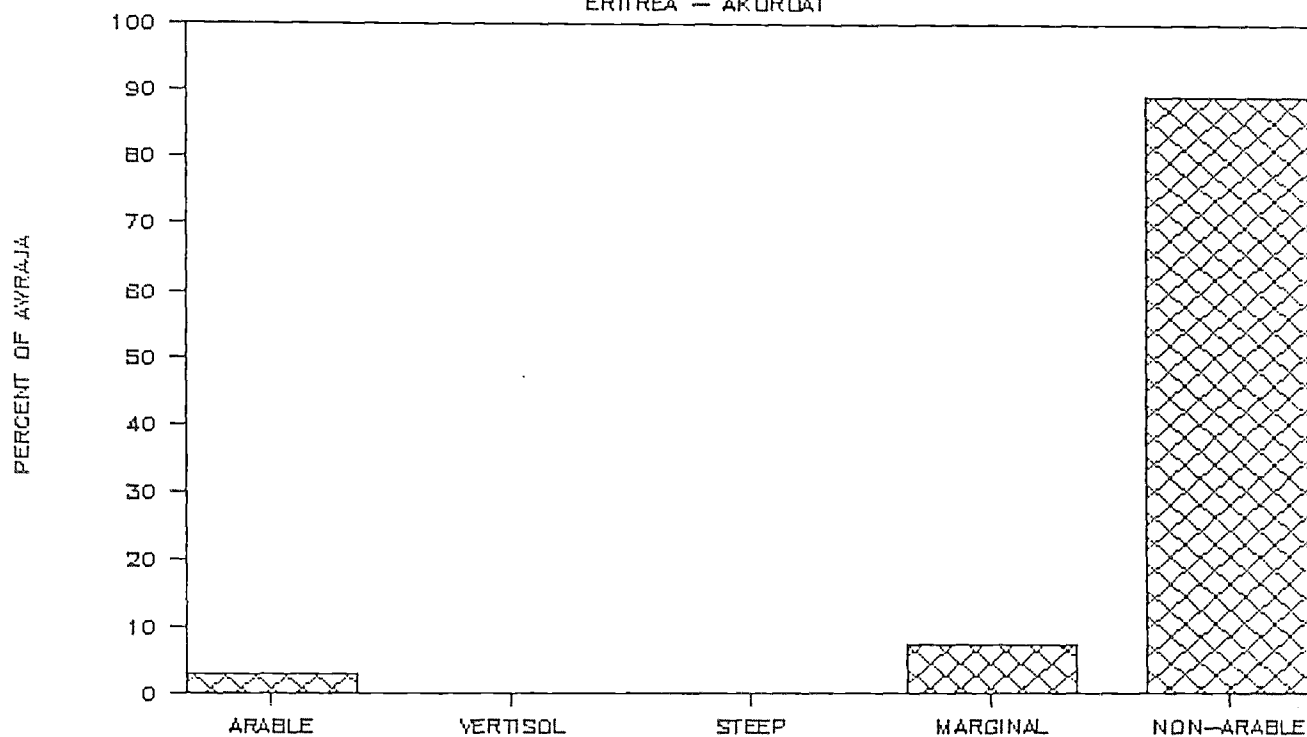
LAND MANAGEMENT CLASSES

ERITREA — KEREN



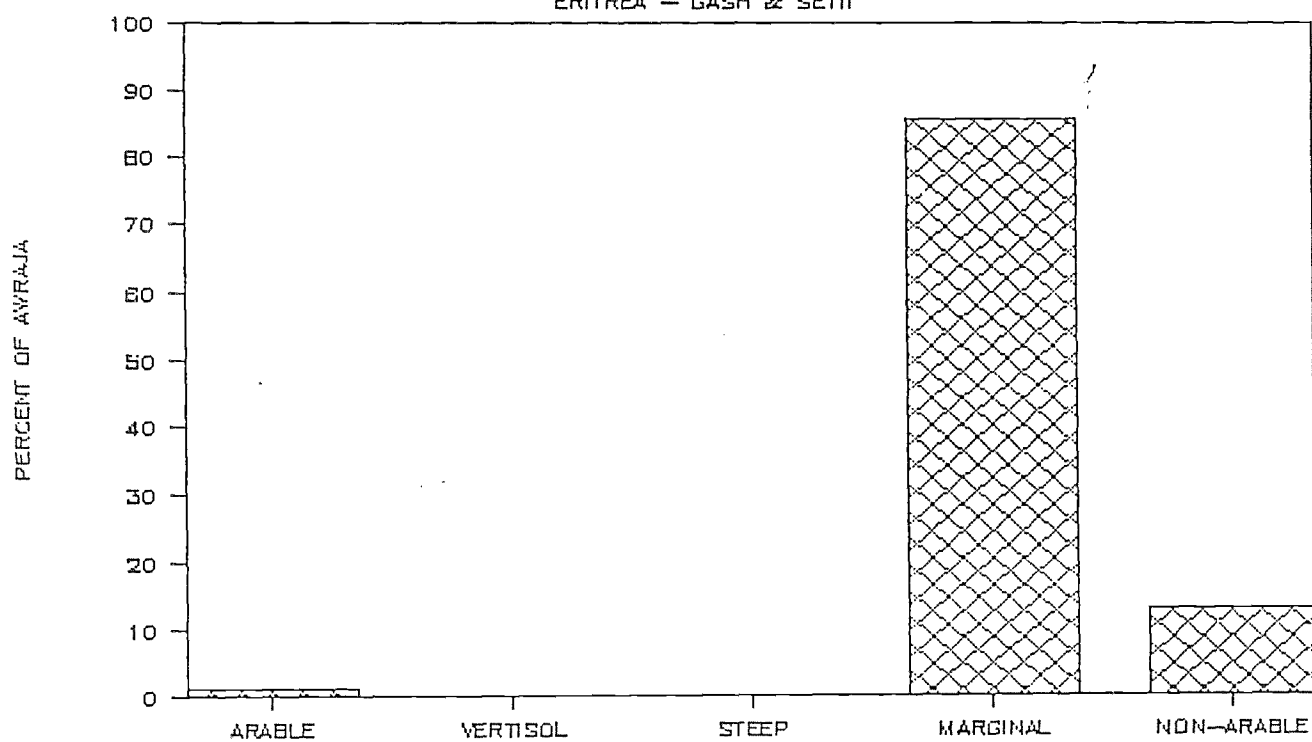
LAND MANAGEMENT CLASSES

ERITREA — AKORDAT



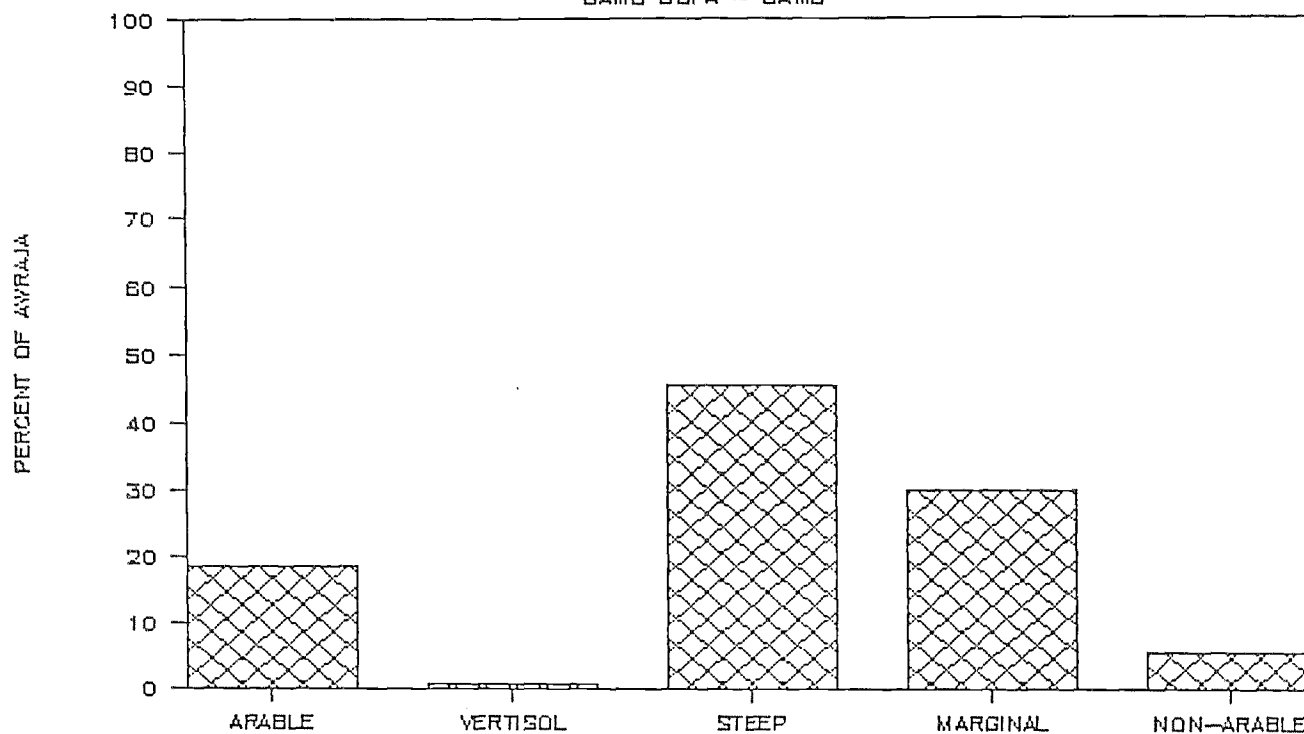
LAND MANAGEMENT CLASSES

ERITREA — GASH & SETIT



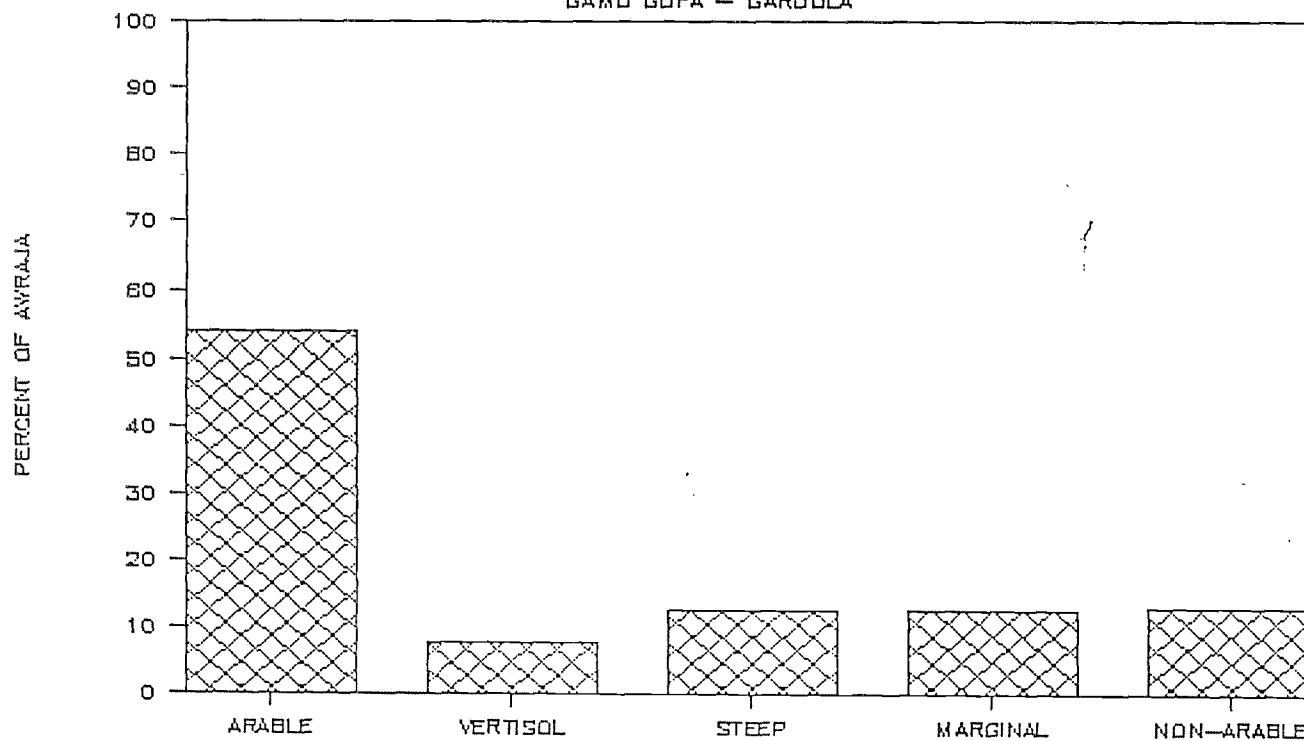
LAND MANAGEMENT CLASSES

GAMO GOFA - GAMO



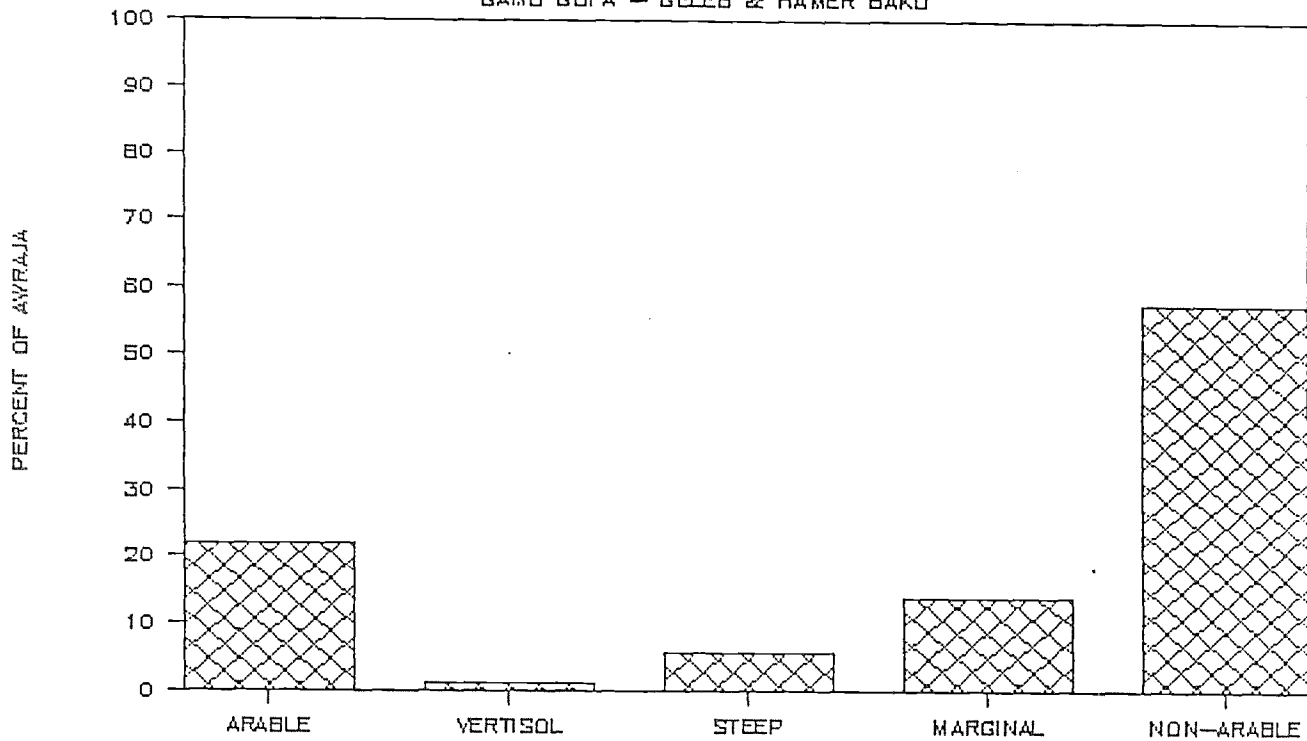
LAND MANAGEMENT CLASSES

GAMO GOFA - GARDULA



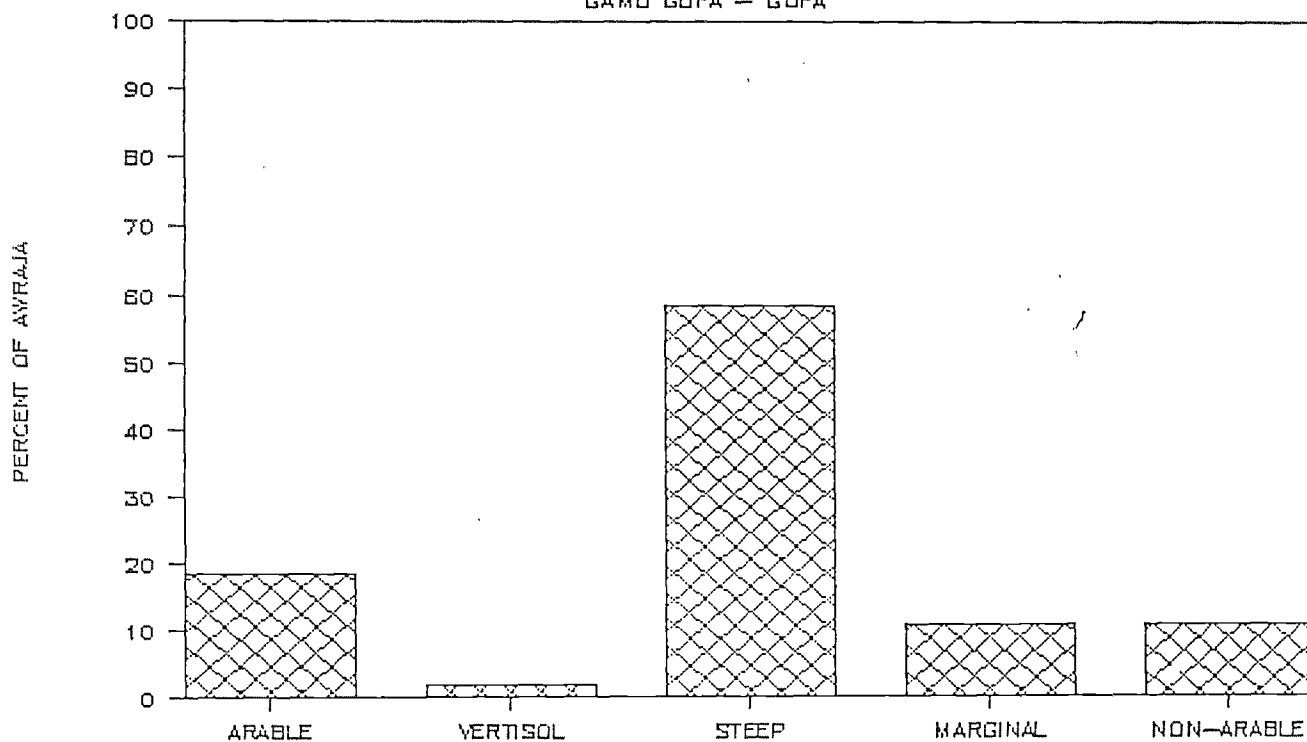
LAND MANAGEMENT CLASSES

GAMO GOFA — GELEB & HAMER BAKO



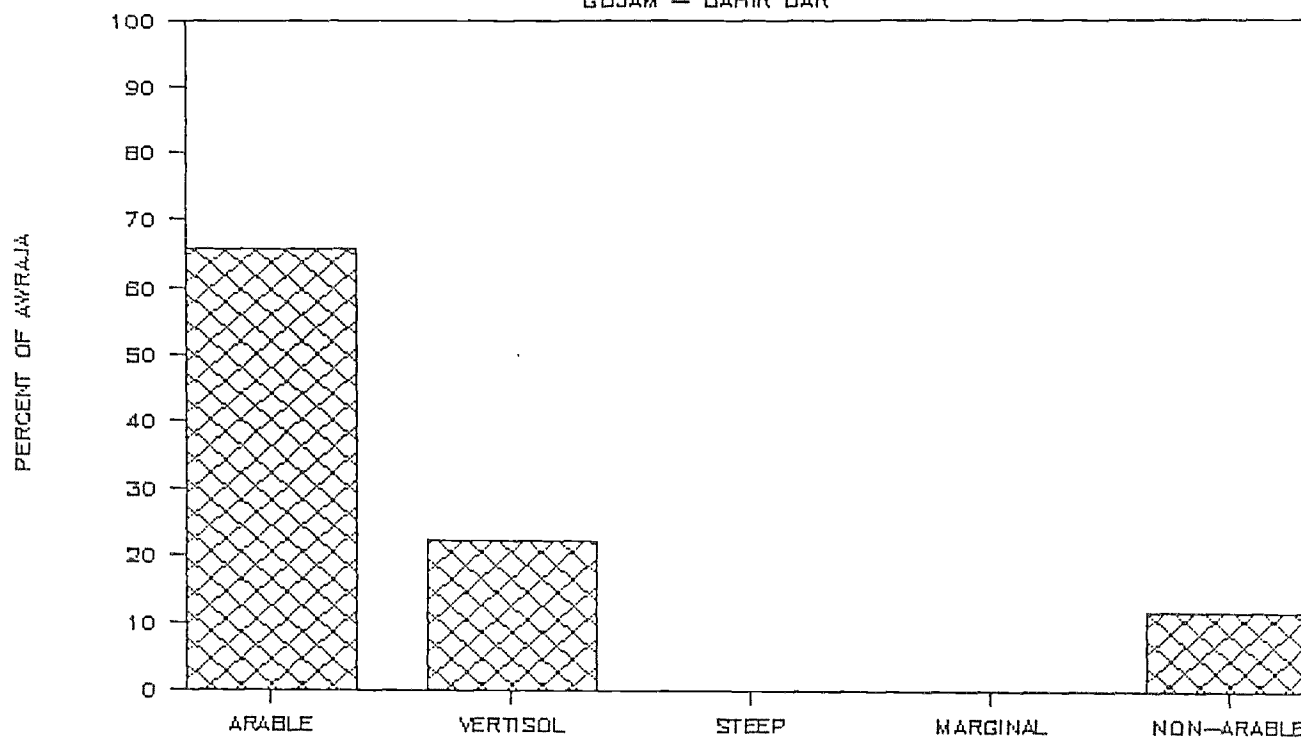
LAND MANAGEMENT CLASSES

GAMO GOFA — GOFA



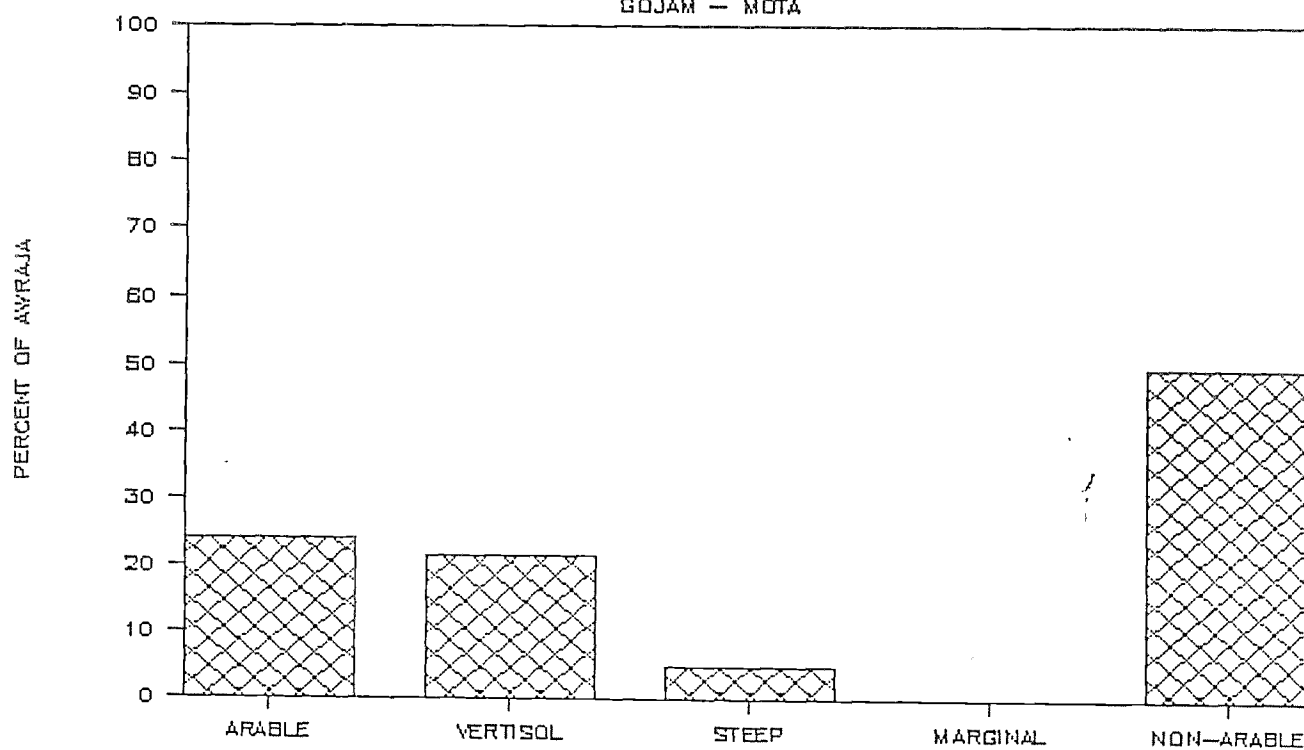
LAND MANAGEMENT CLASSES

GOJAM — BAHIR DAR



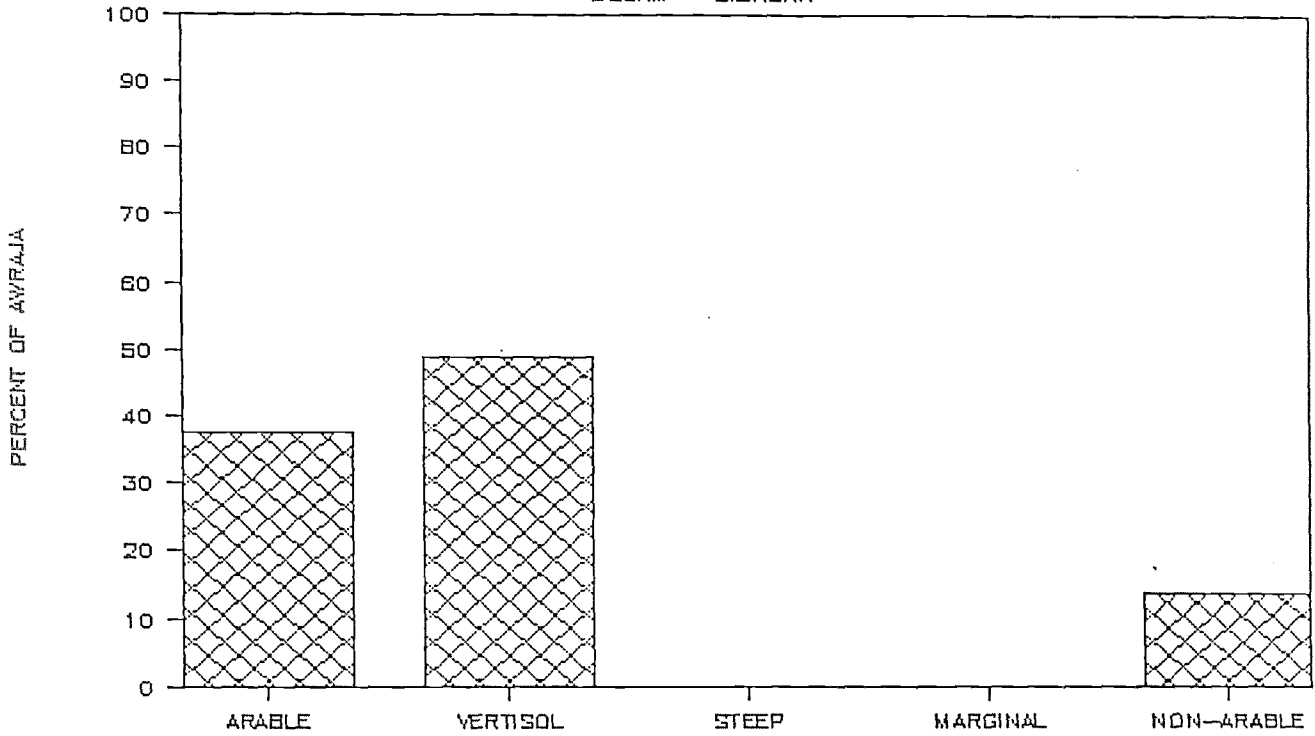
LAND MANAGEMENT CLASSES

GOJAM — MOTA



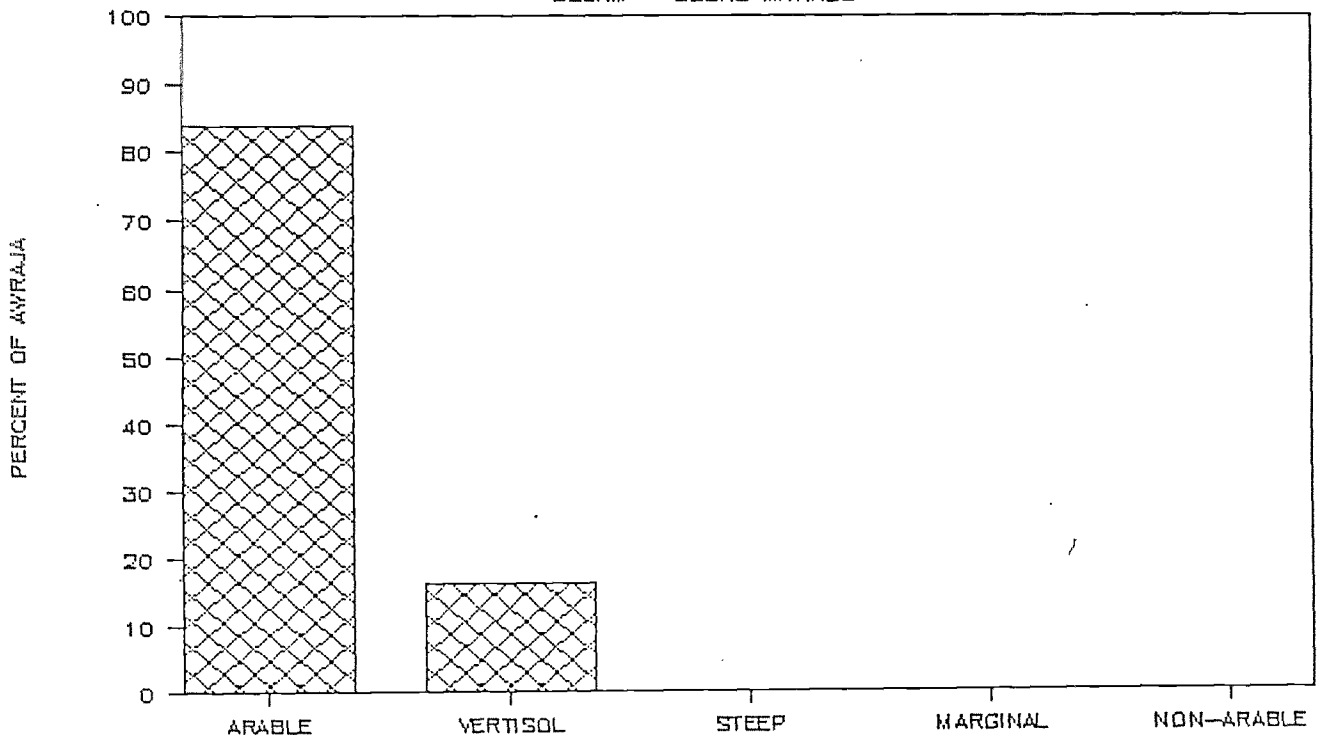
LAND MANAGEMENT CLASSES

GOJAM — BICHENA



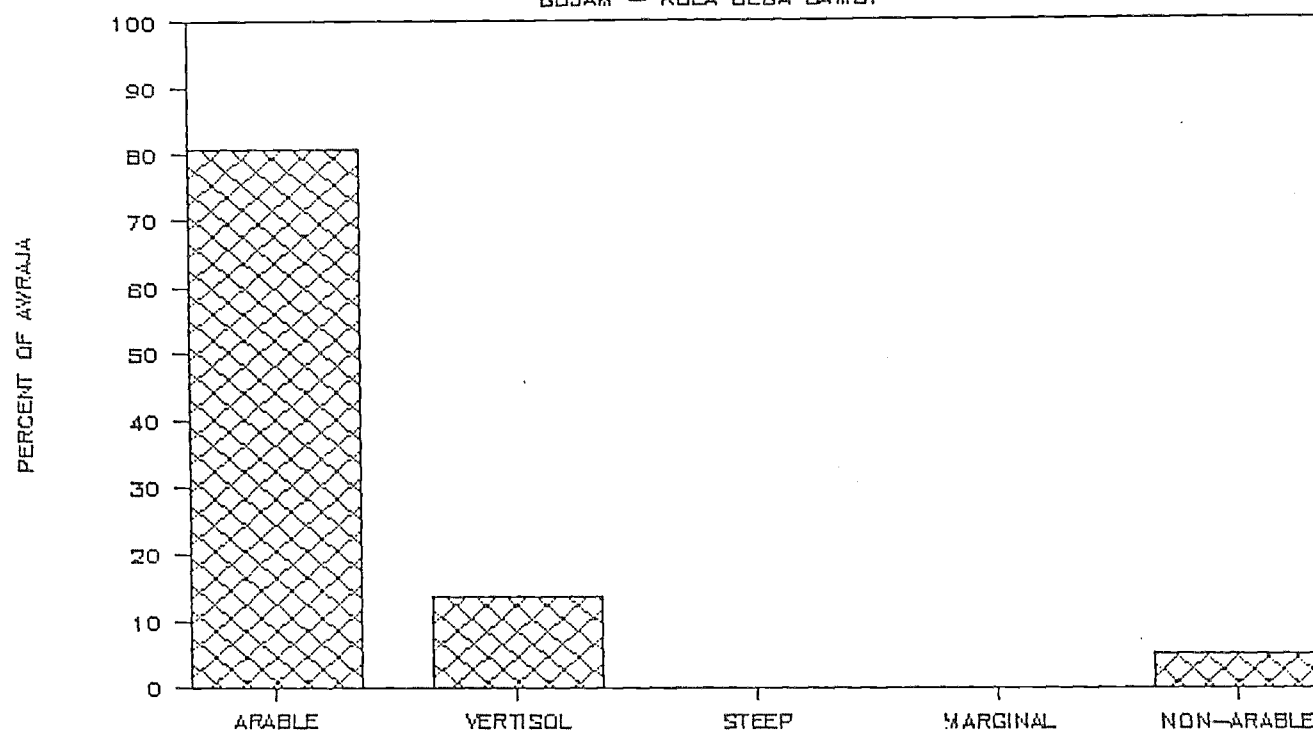
LAND MANAGEMENT CLASSES

GOJAM — DEBRE MARKOS



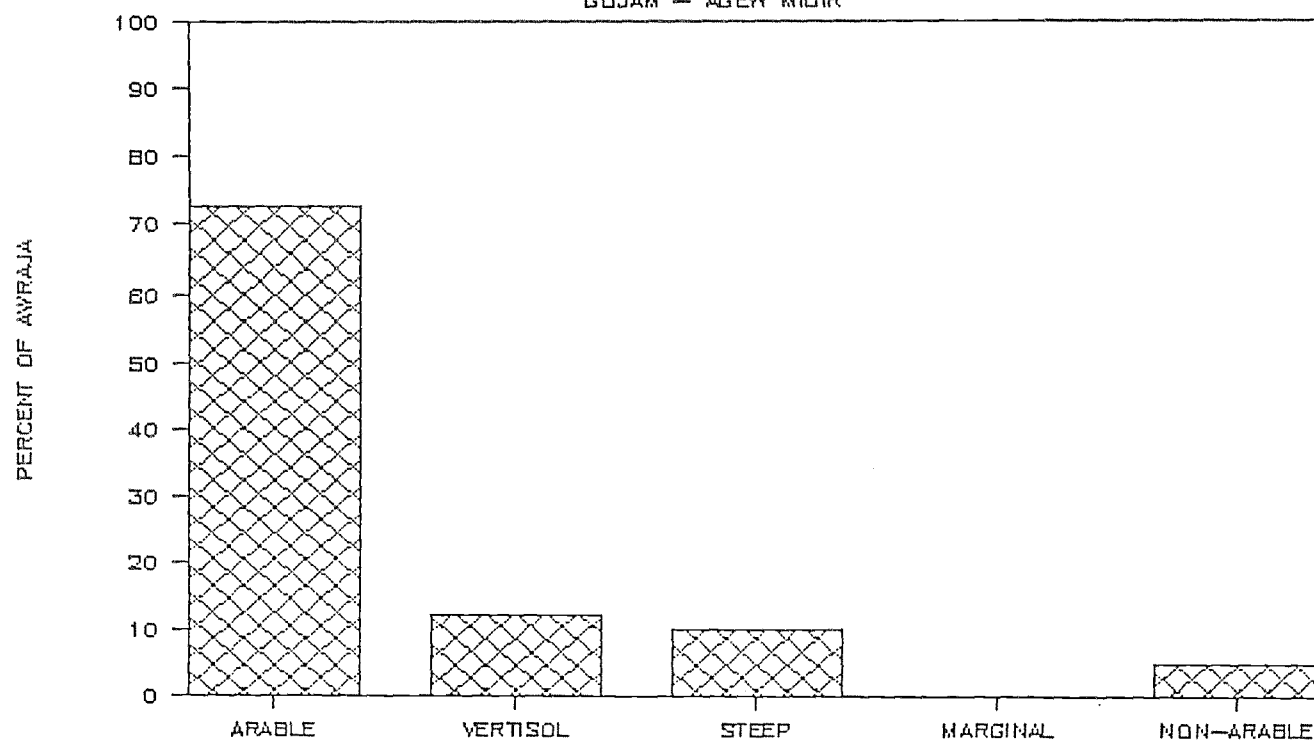
LAND MANAGEMENT CLASSES

GOJAM — KOLA DEGA DAMOT



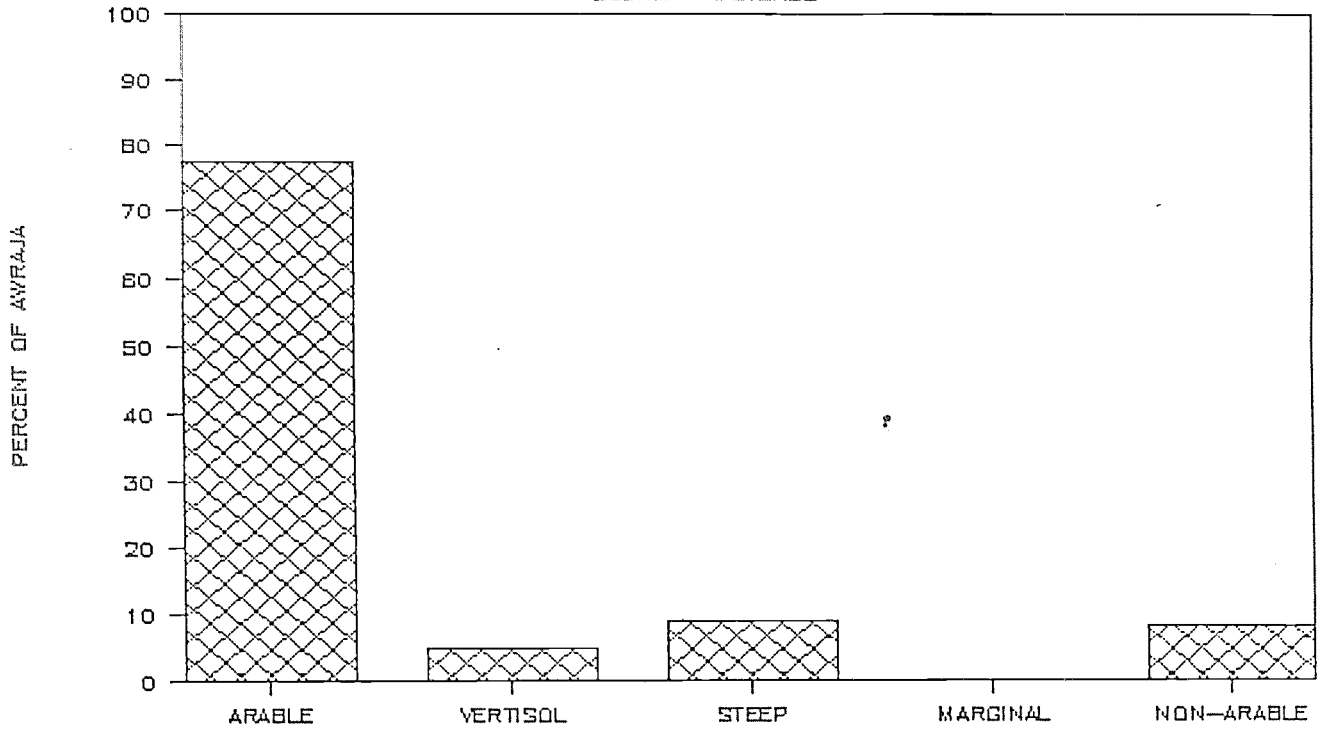
LAND MANAGEMENT CLASSES

GOJAM — AGEW MIDIR



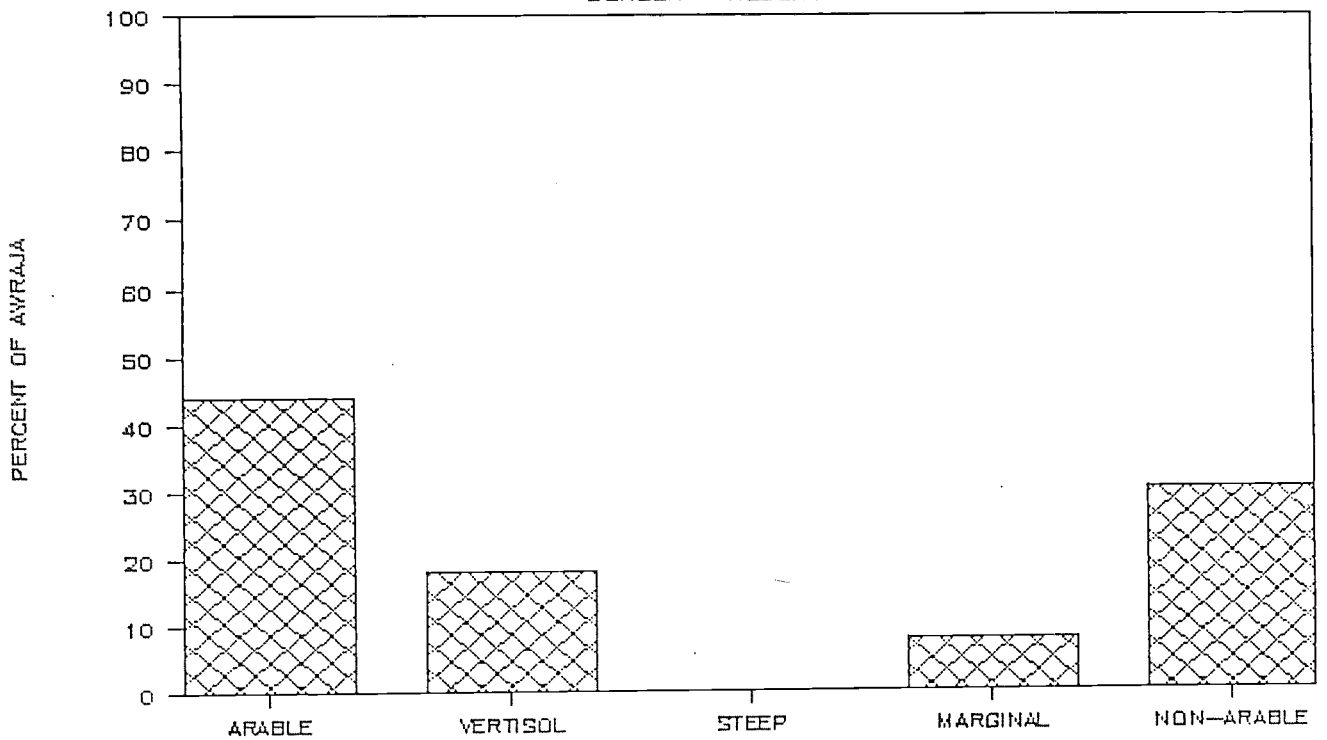
LAND MANAGEMENT CLASSES

GOJAM — METEKEL



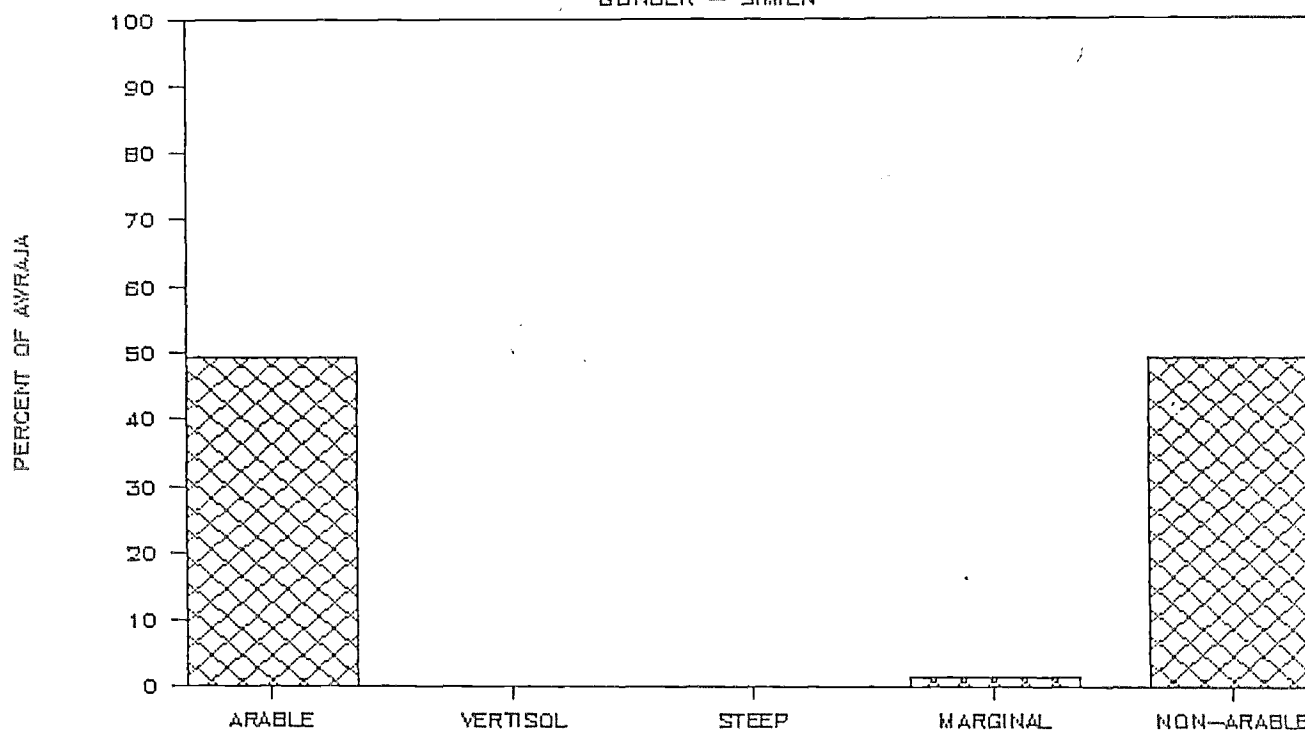
LAND MANAGEMENT CLASSES

GONDER — WEGERA



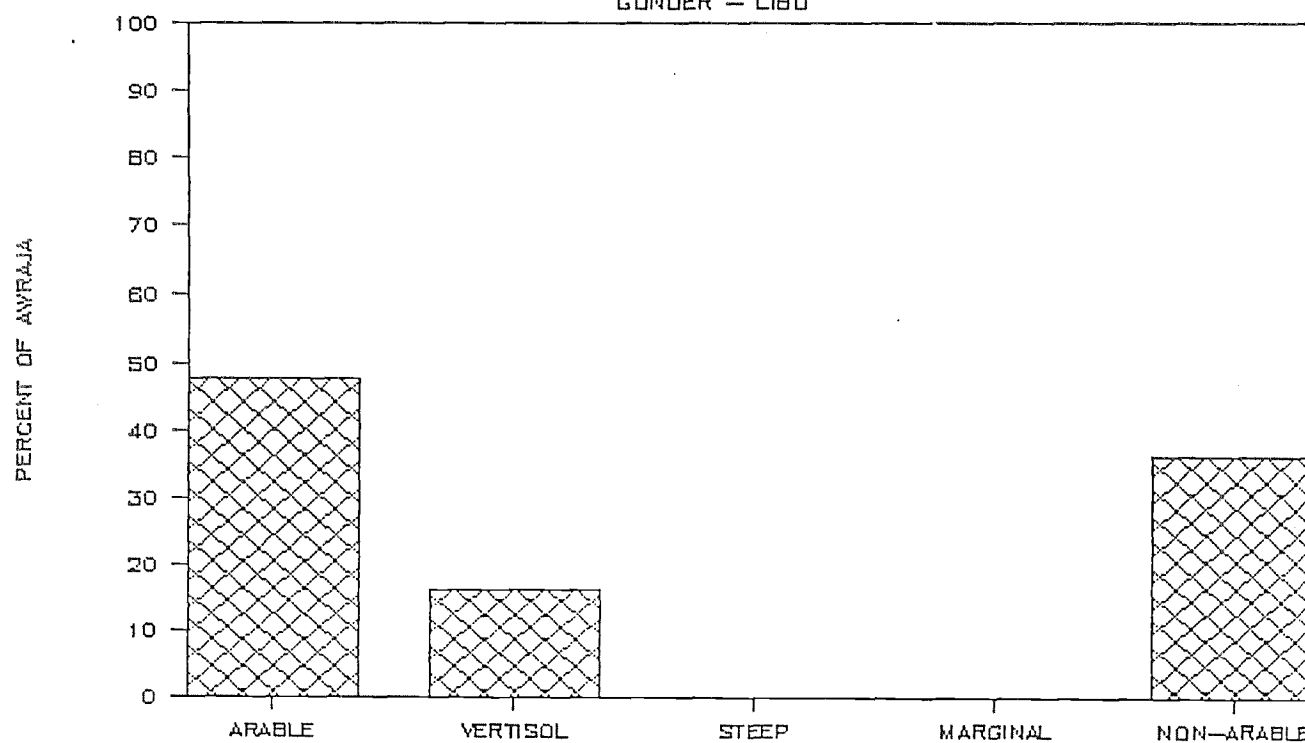
LAND MANAGEMENT CLASSES

GONDER - SIMIEN



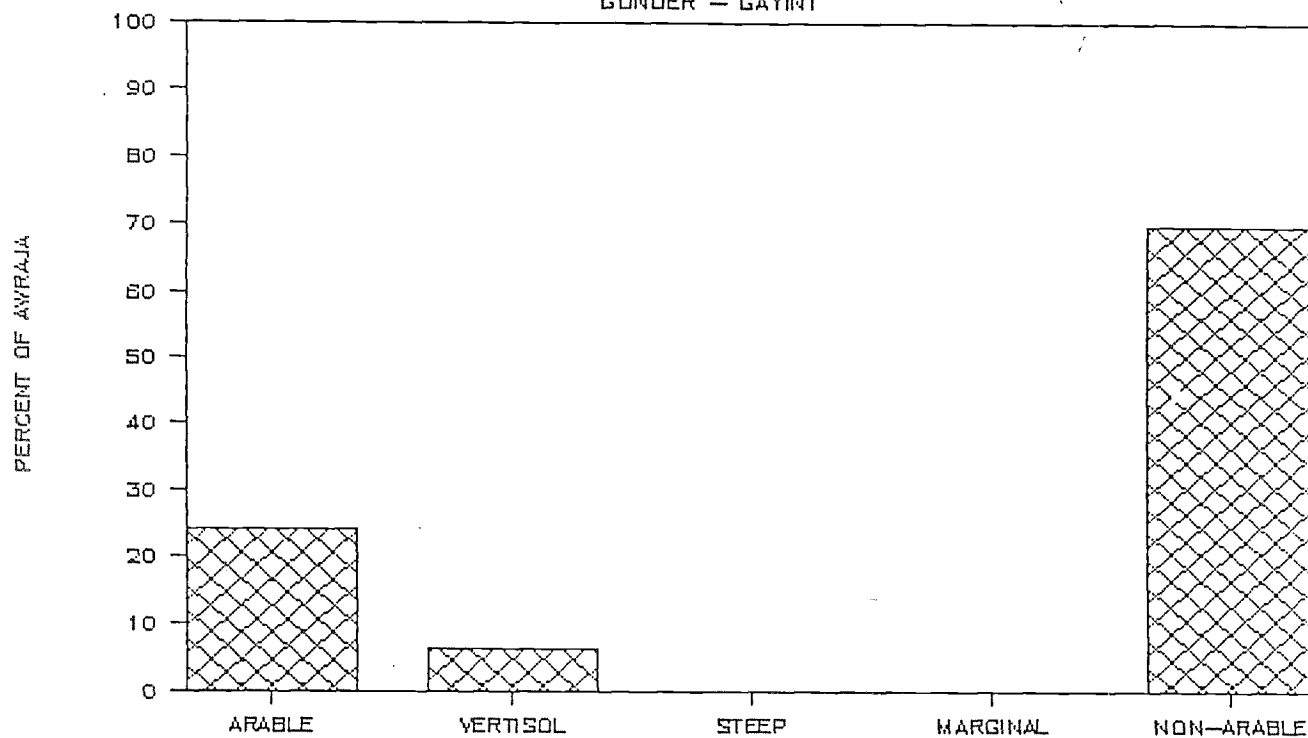
LAND MANAGEMENT CLASSES

GONDER - LIBO



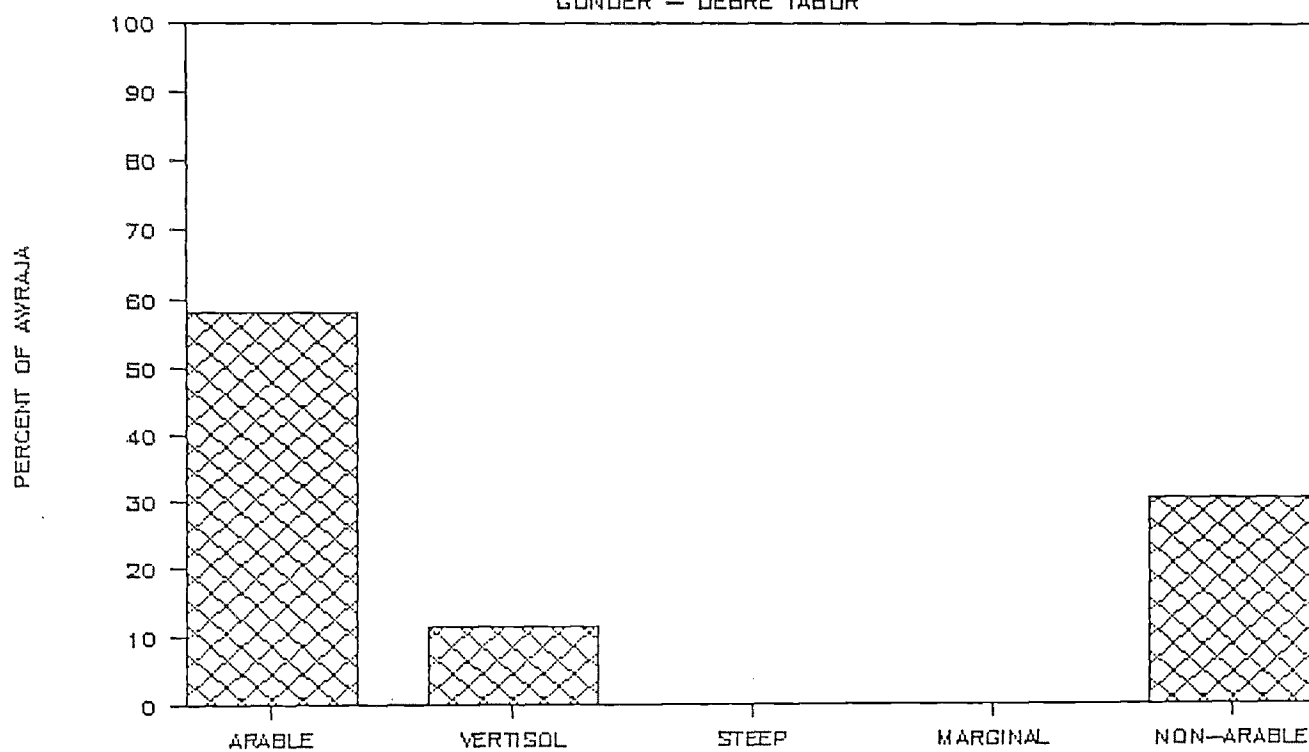
LAND MANAGEMENT CLASSES

GONDER - GAYINT



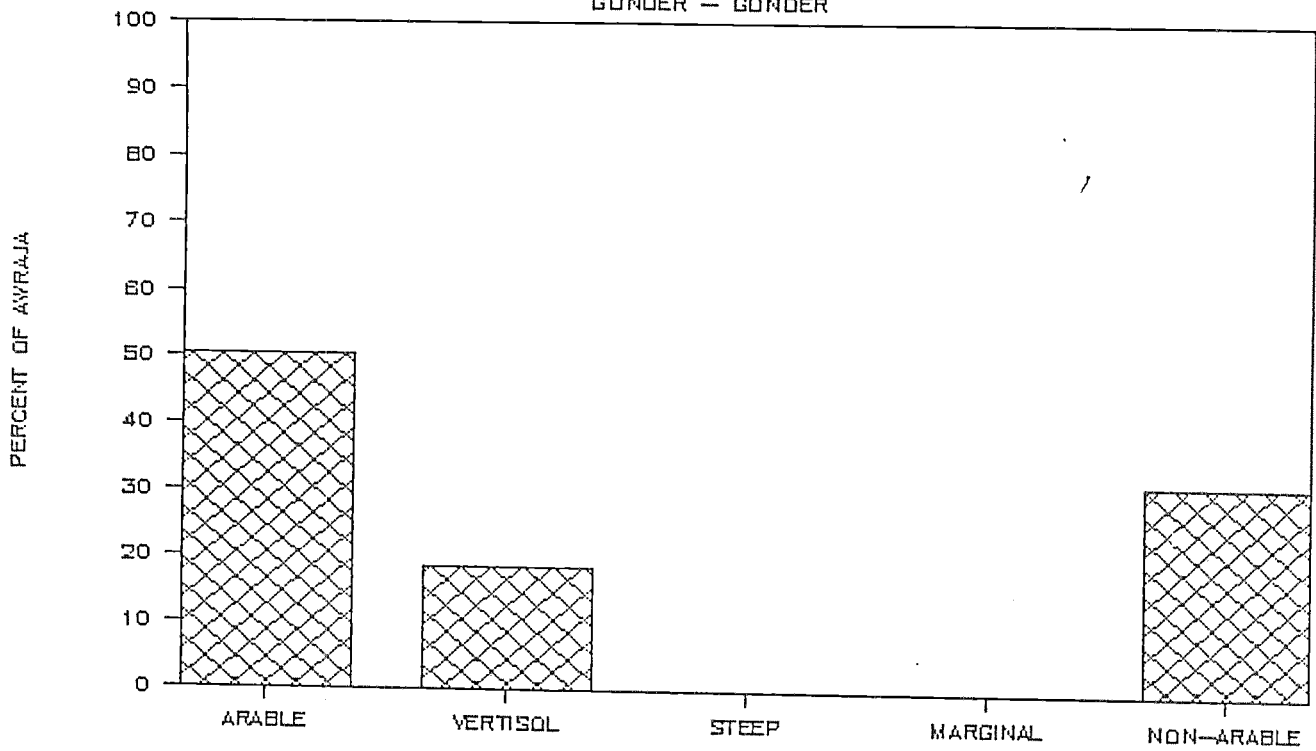
LAND MANAGEMENT CLASSES

GONDER - DEBRE TABOR



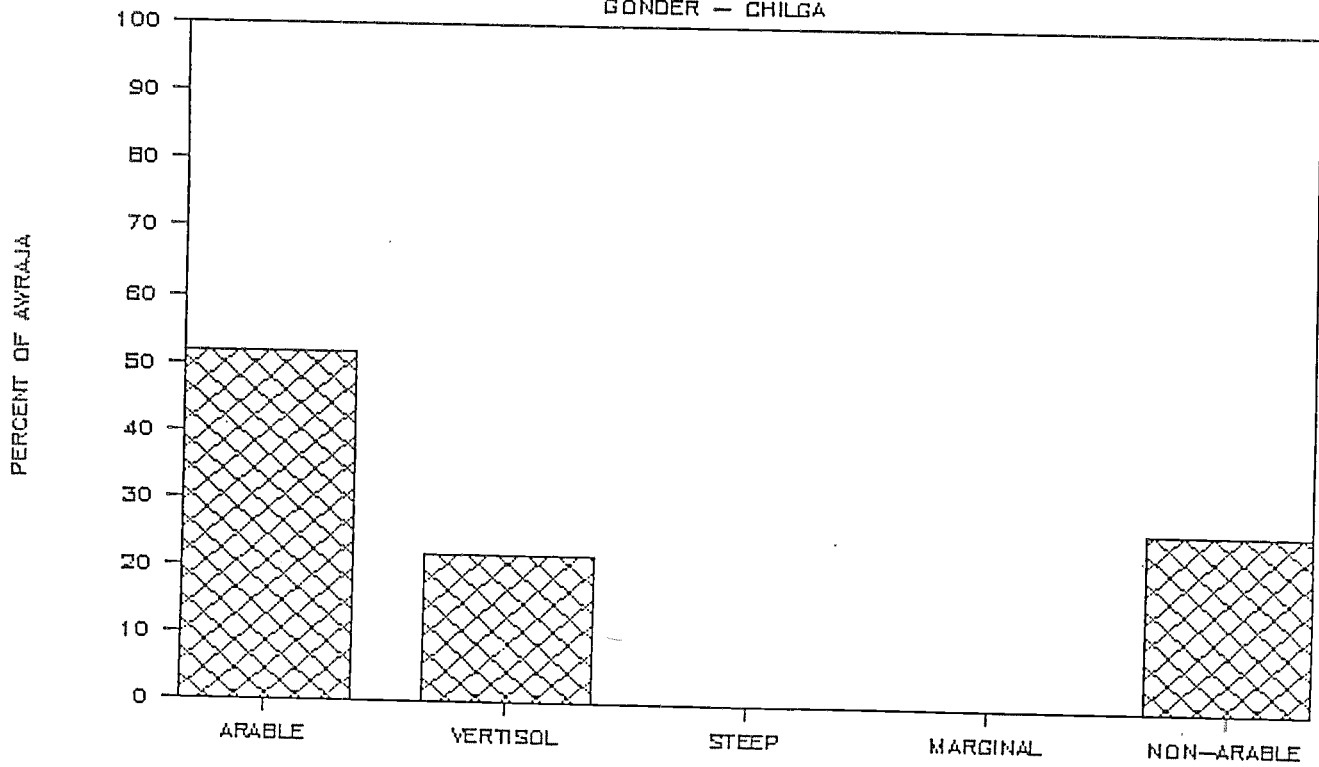
LAND MANAGEMENT CLASSES

GONDER - GONDER



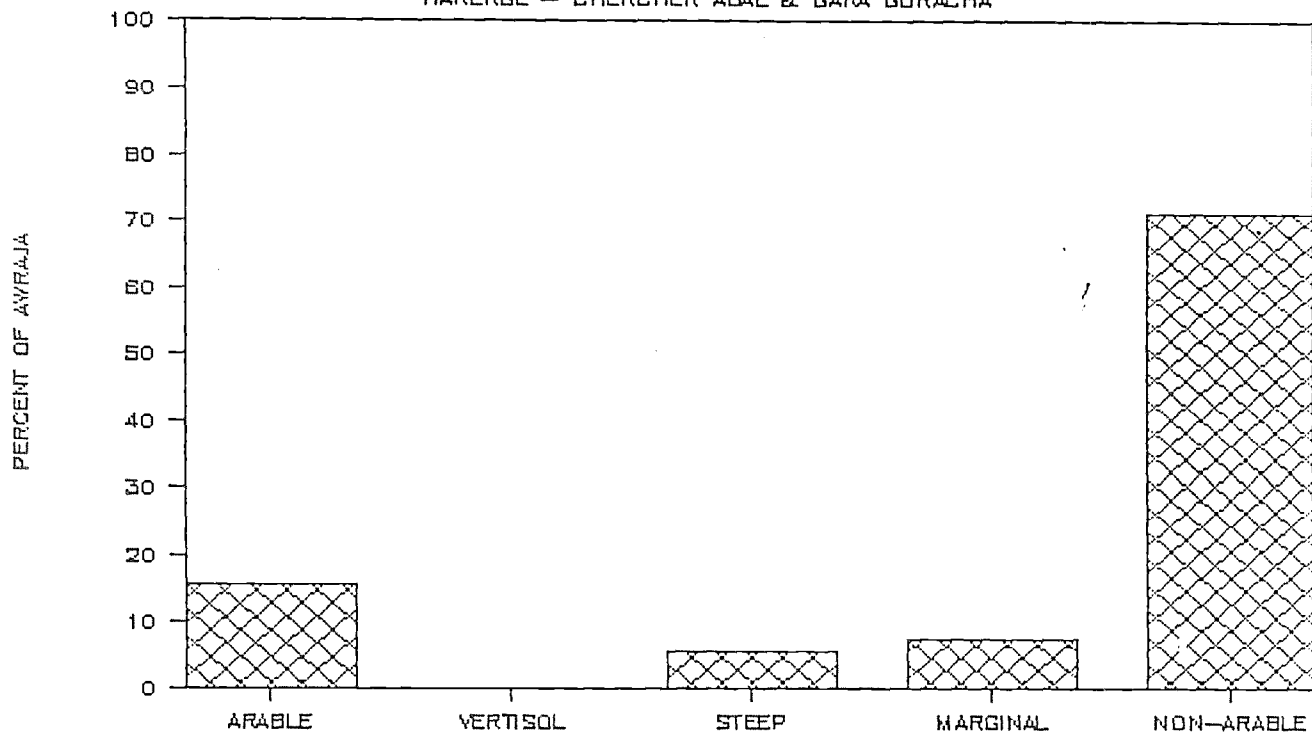
LAND MANAGEMENT CLASSES

GONDER - CHILGA



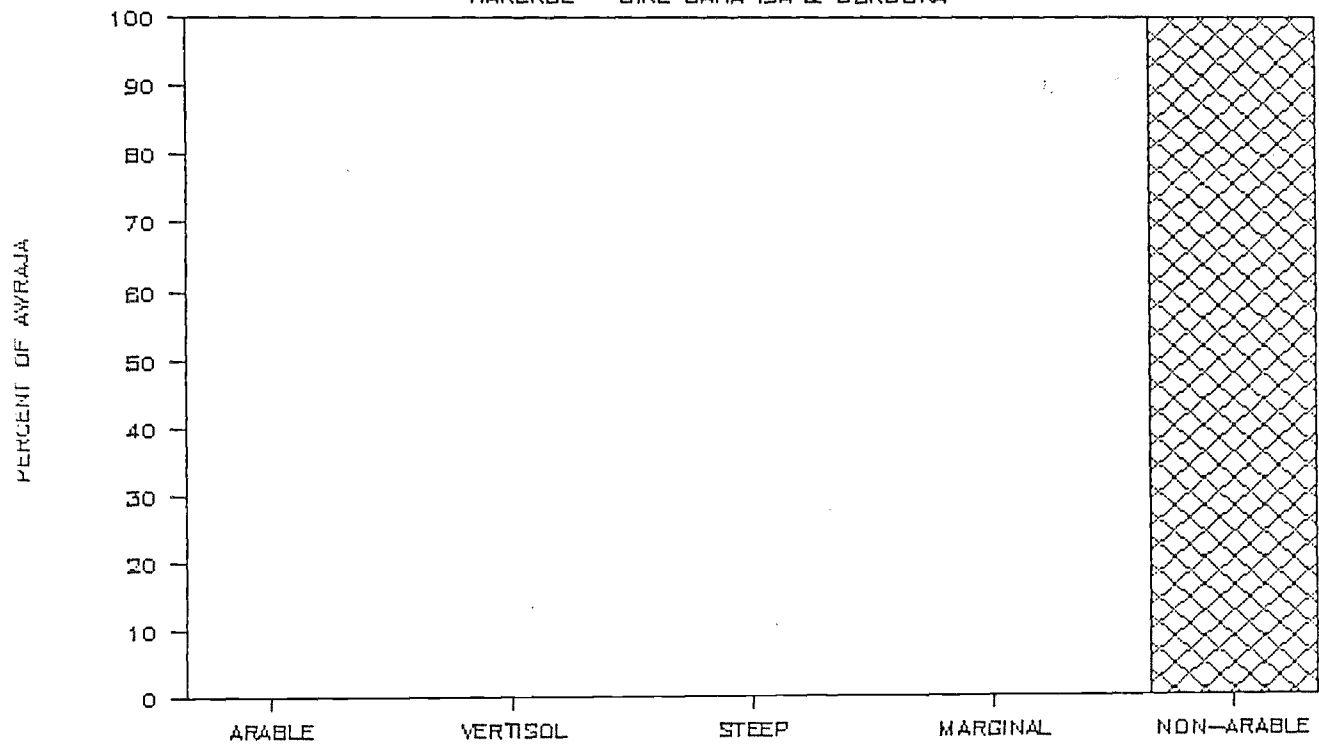
LAND MANAGEMENT CLASSES

HARERGE - CHERCHER ADAL & GARA GURACHA



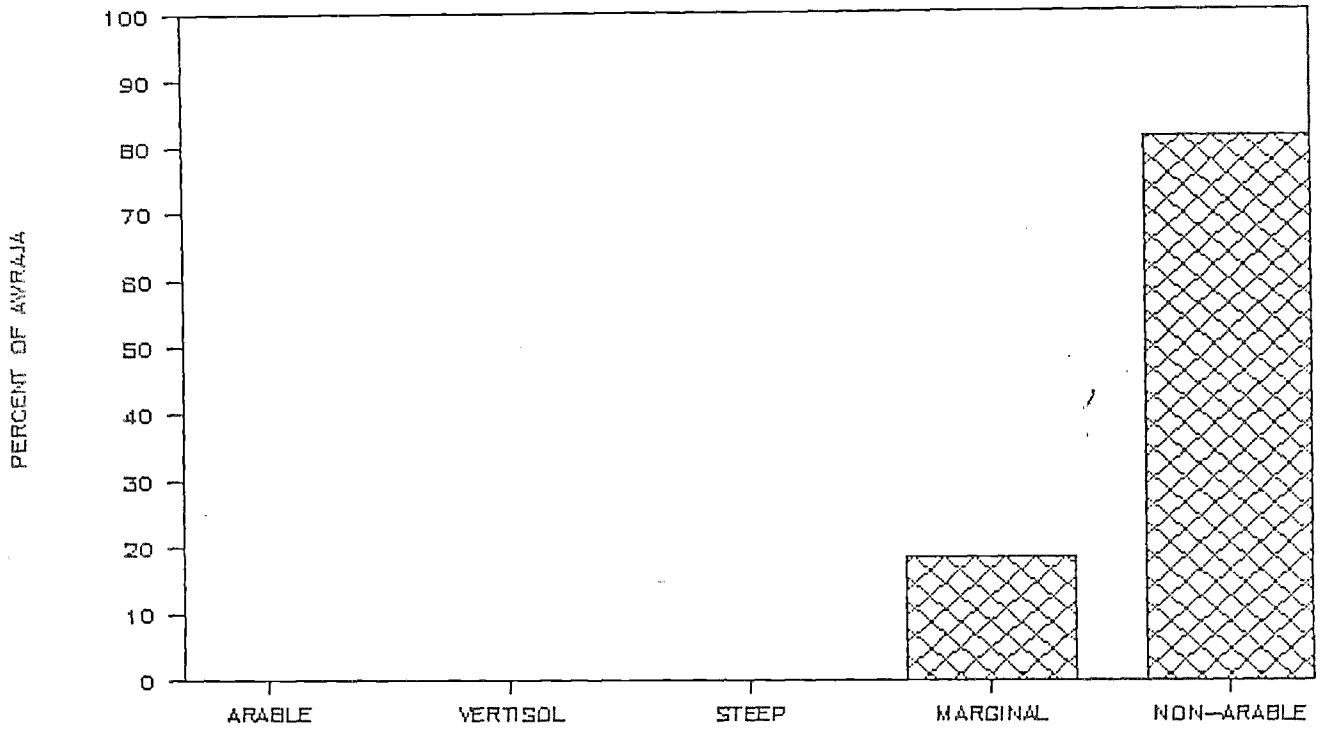
LAND MANAGEMENT CLASSES

HARERGE - DIRE DAWA ISA & GURGURA



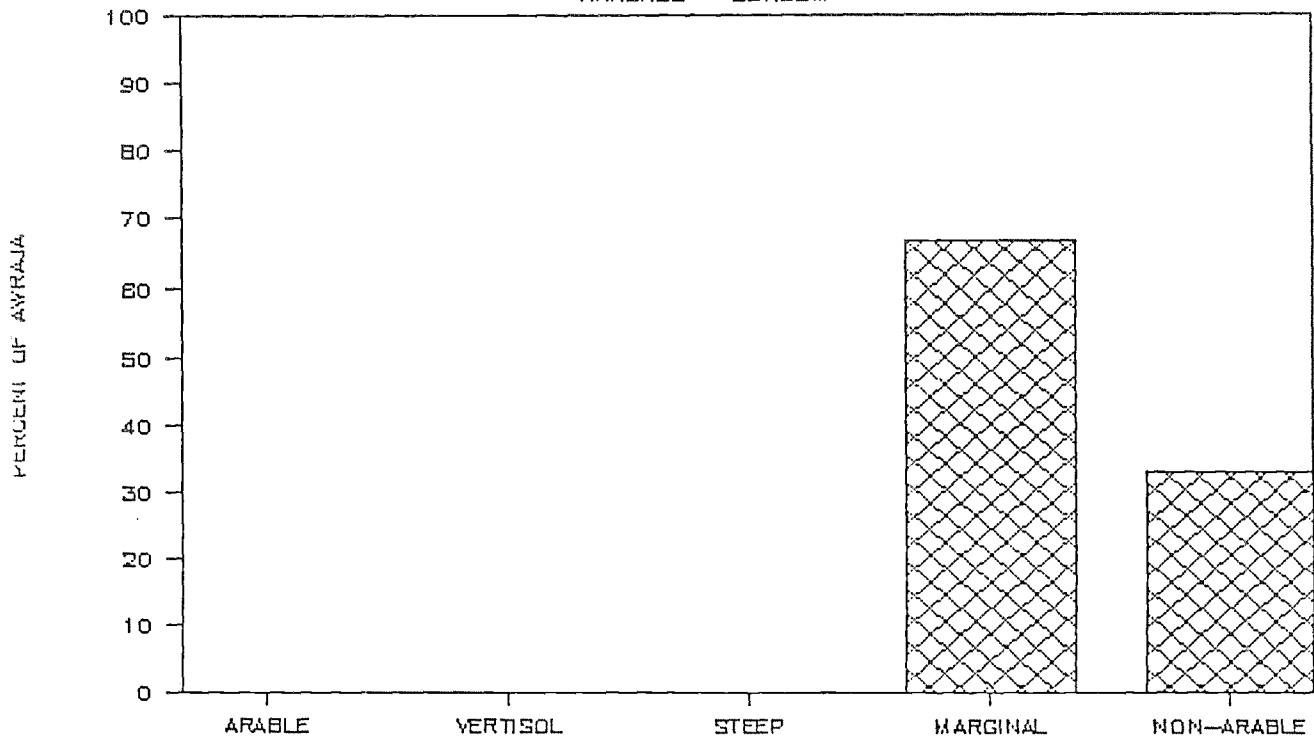
LAND MANAGEMENT CLASSES

HARERGE - JUIGA



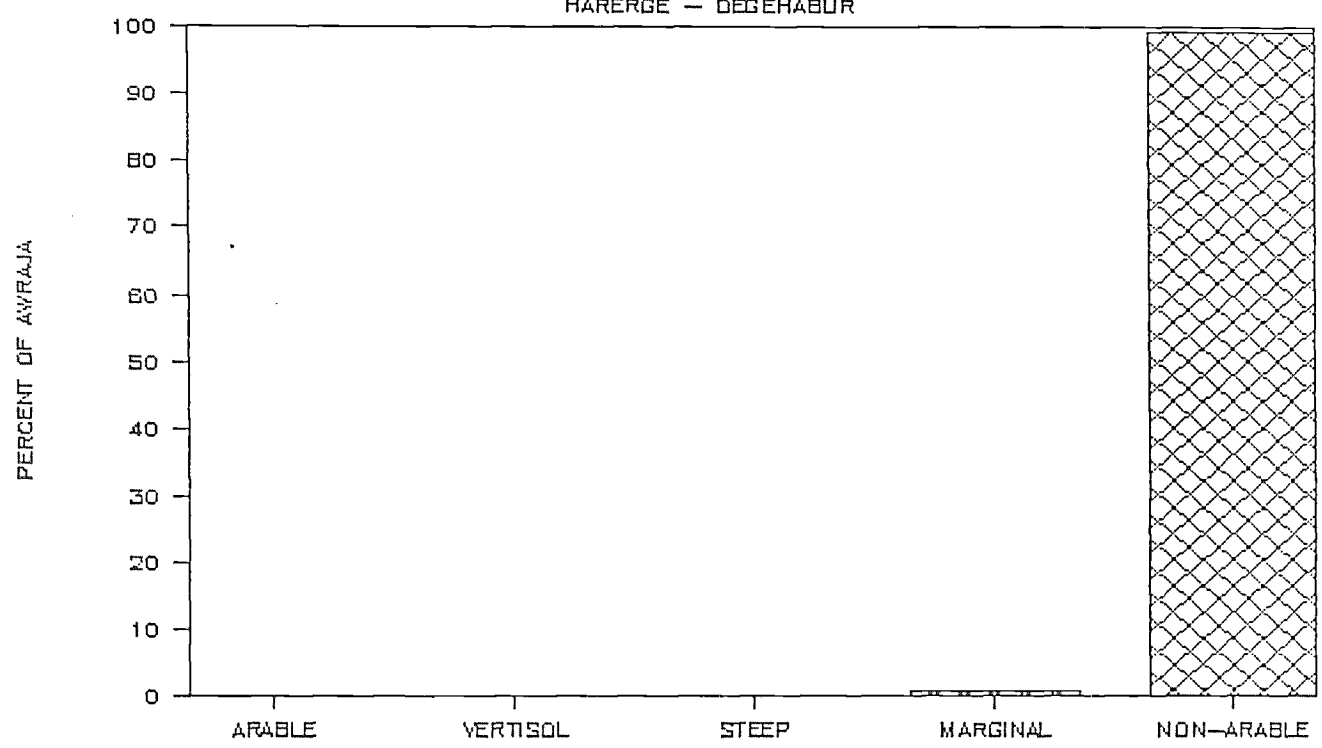
LAND MANAGEMENT CLASSES

HARERGE - GURSUM



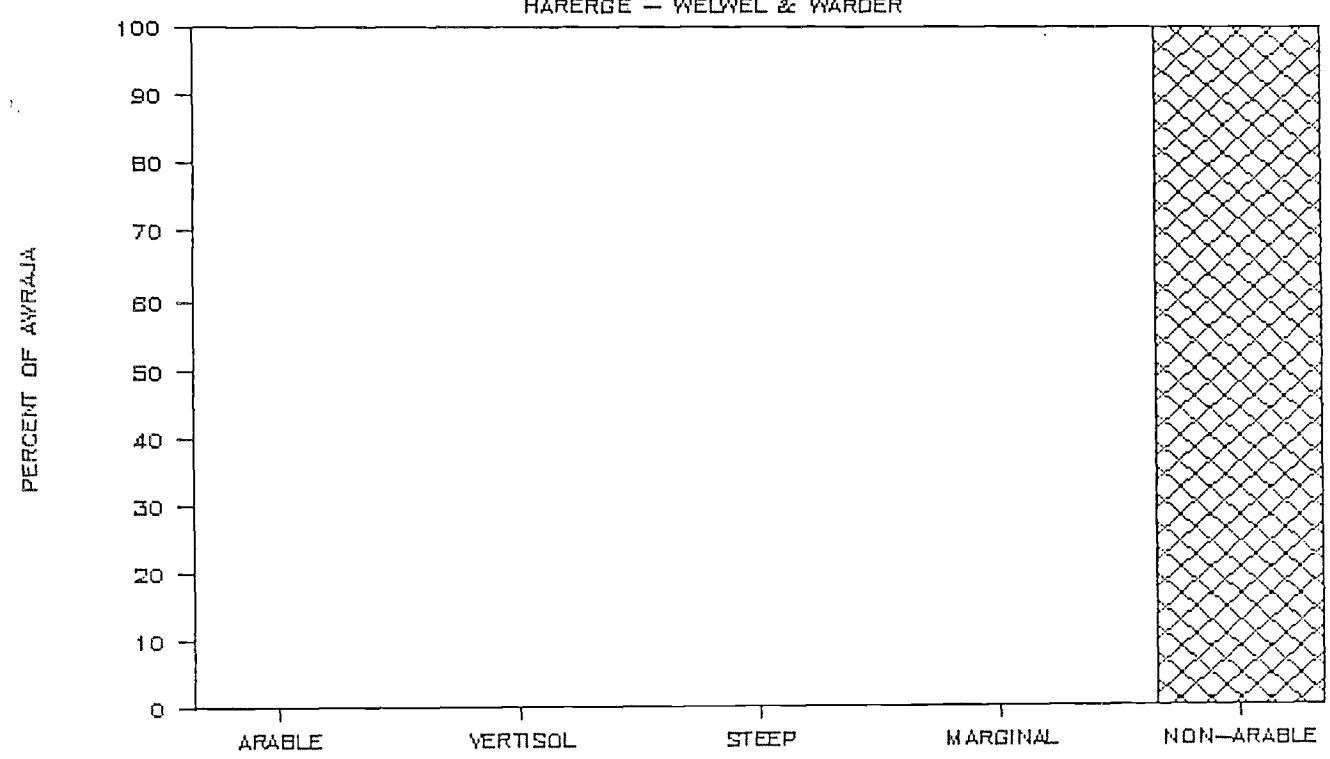
LAND MANAGEMENT CLASSES

HARERGE - DEBEHABUR



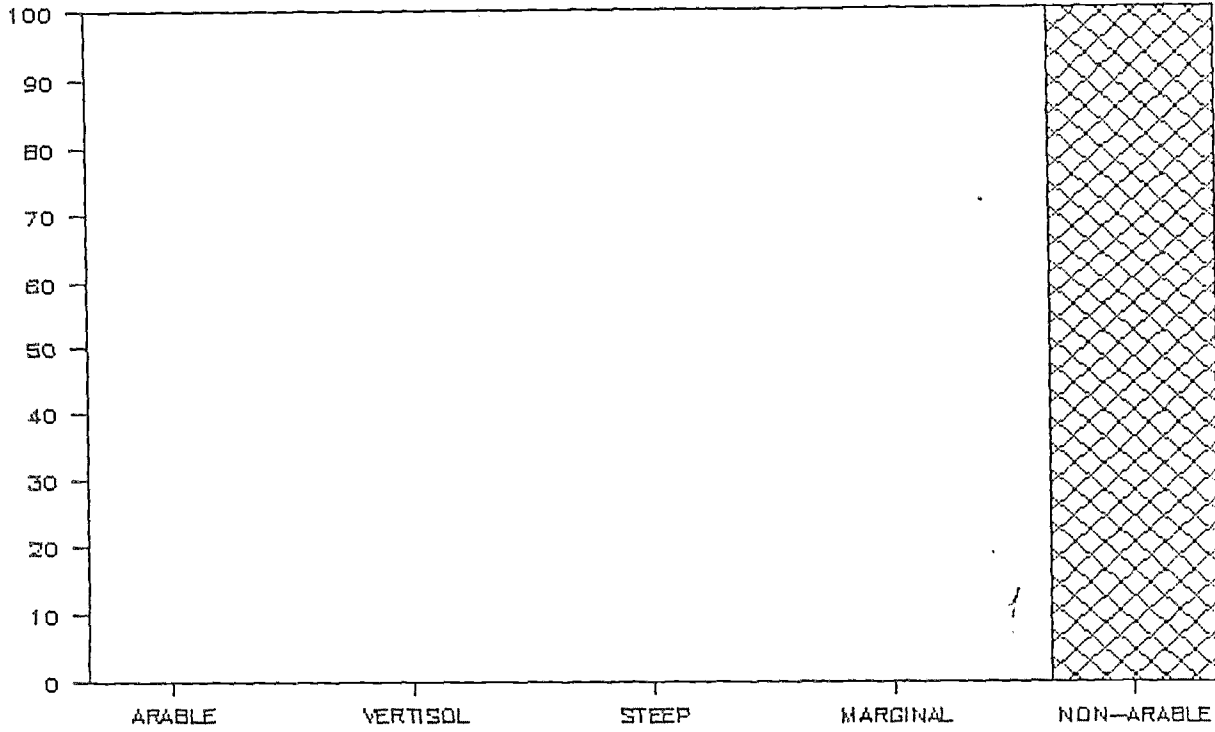
LAND MANAGEMENT CLASSES

HARERGE - WELWEL & WARDER



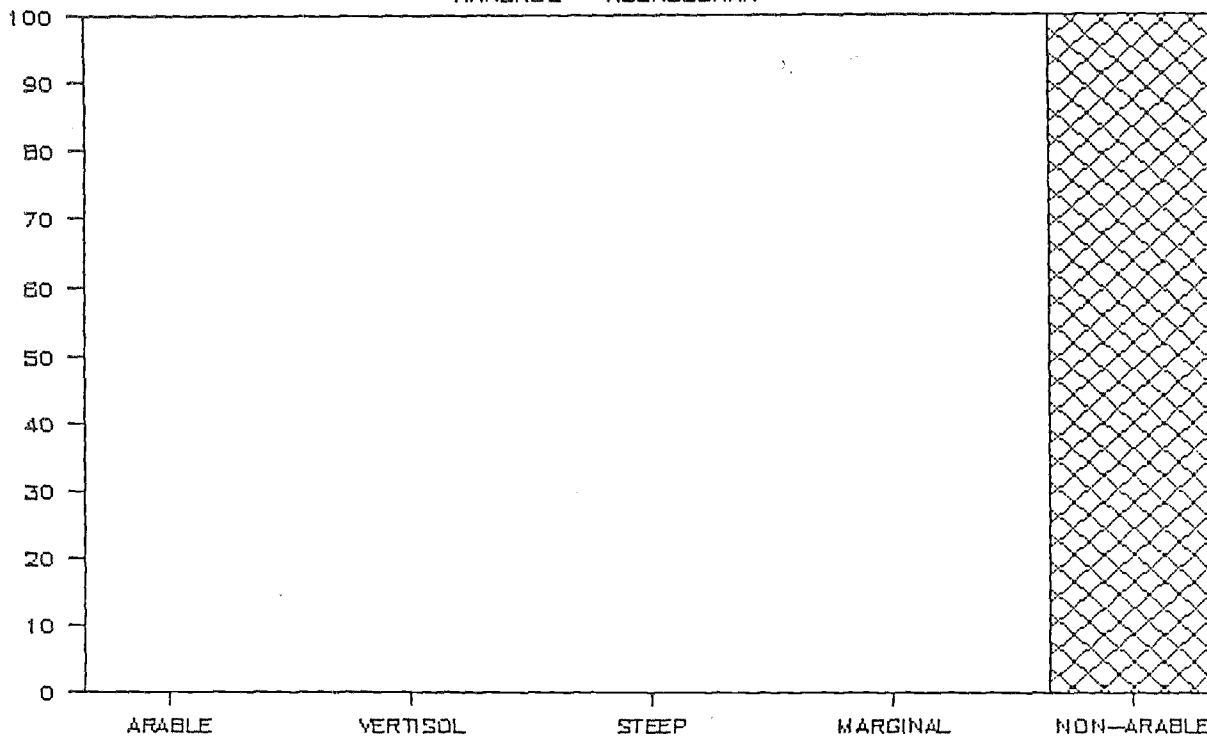
LAND MANAGEMENT CLASSES

HARERGE - KELAFO



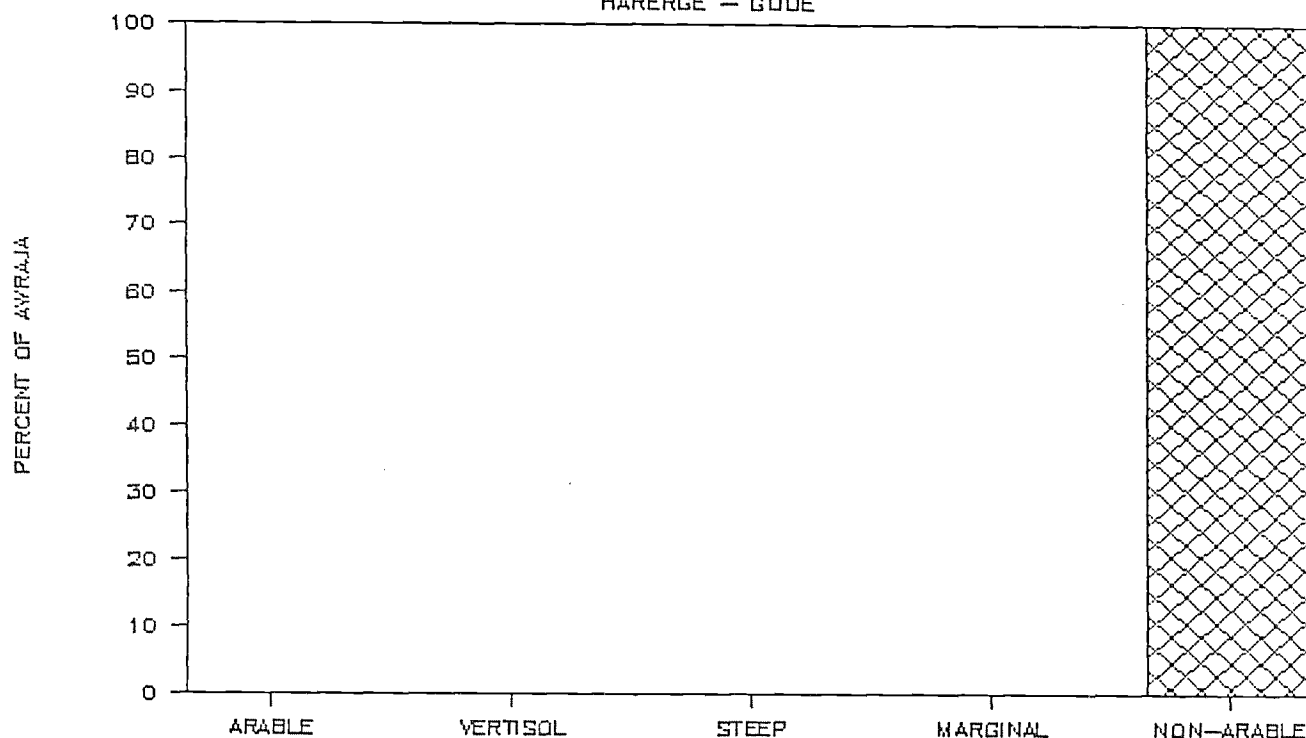
LAND MANAGEMENT CLASSES

HARERGE - KEBREDEHAR



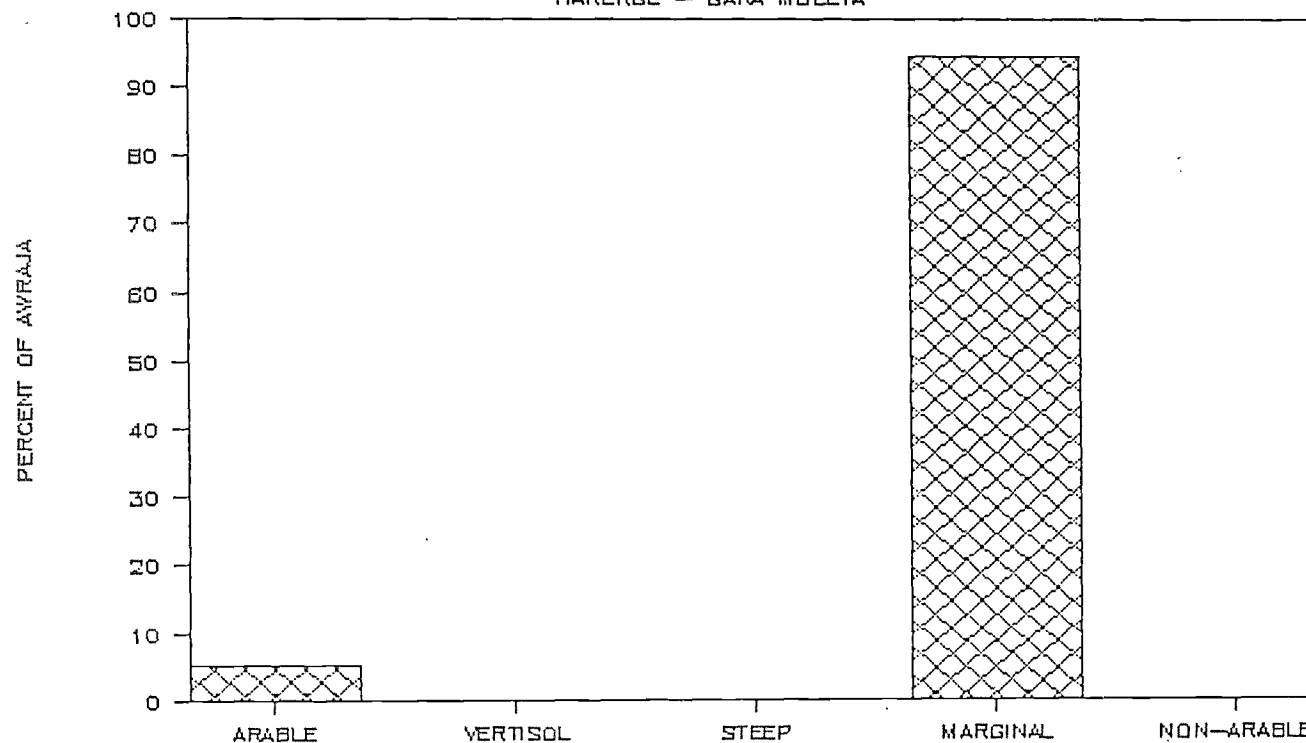
LAND MANAGEMENT CLASSES

HARERGE - GODE



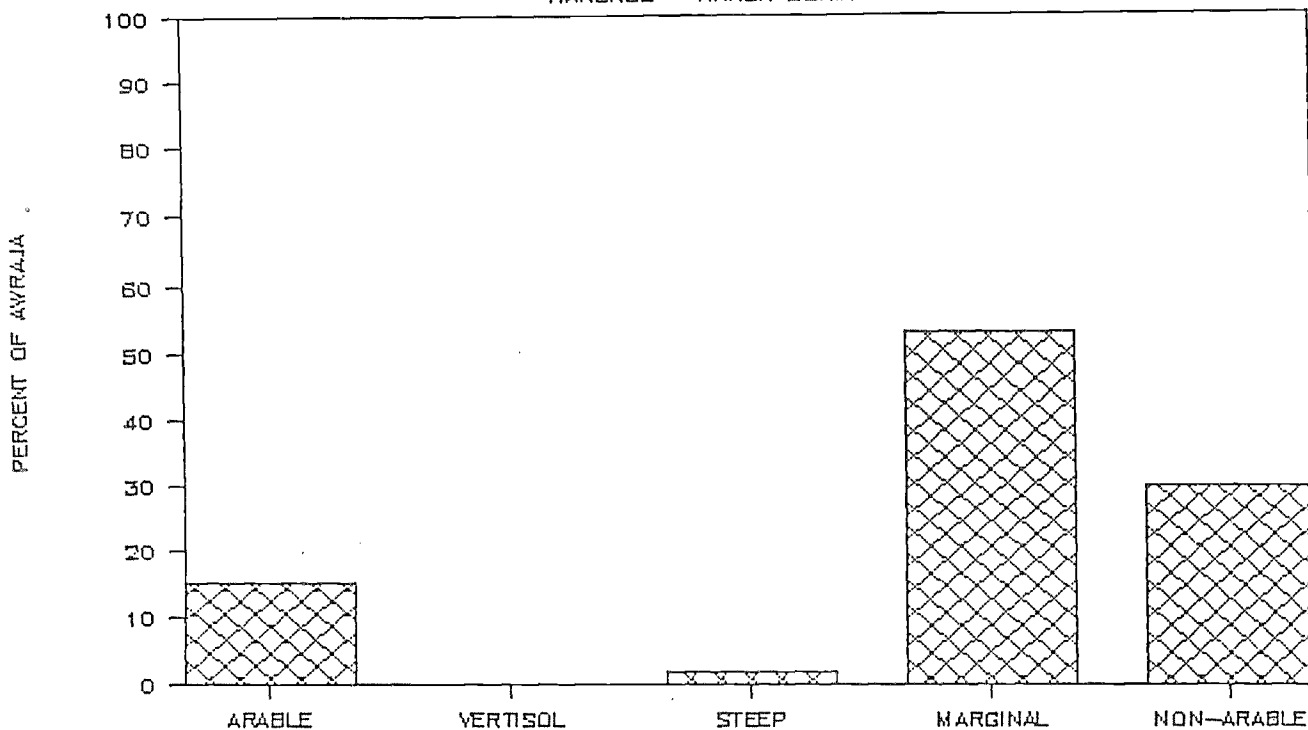
LAND MANAGEMENT CLASSES

HARERGE - GARA MULETA



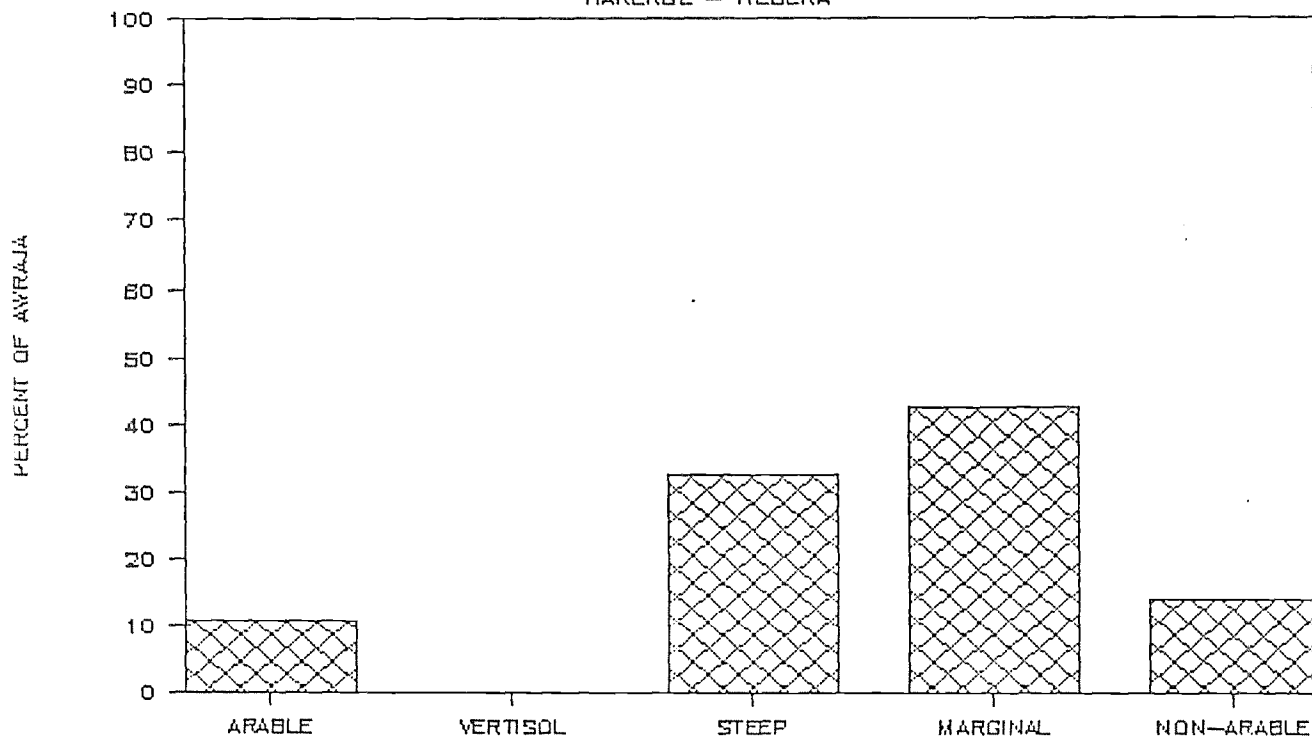
LAND MANAGEMENT CLASSES

HARERGE - HARER ZURIA



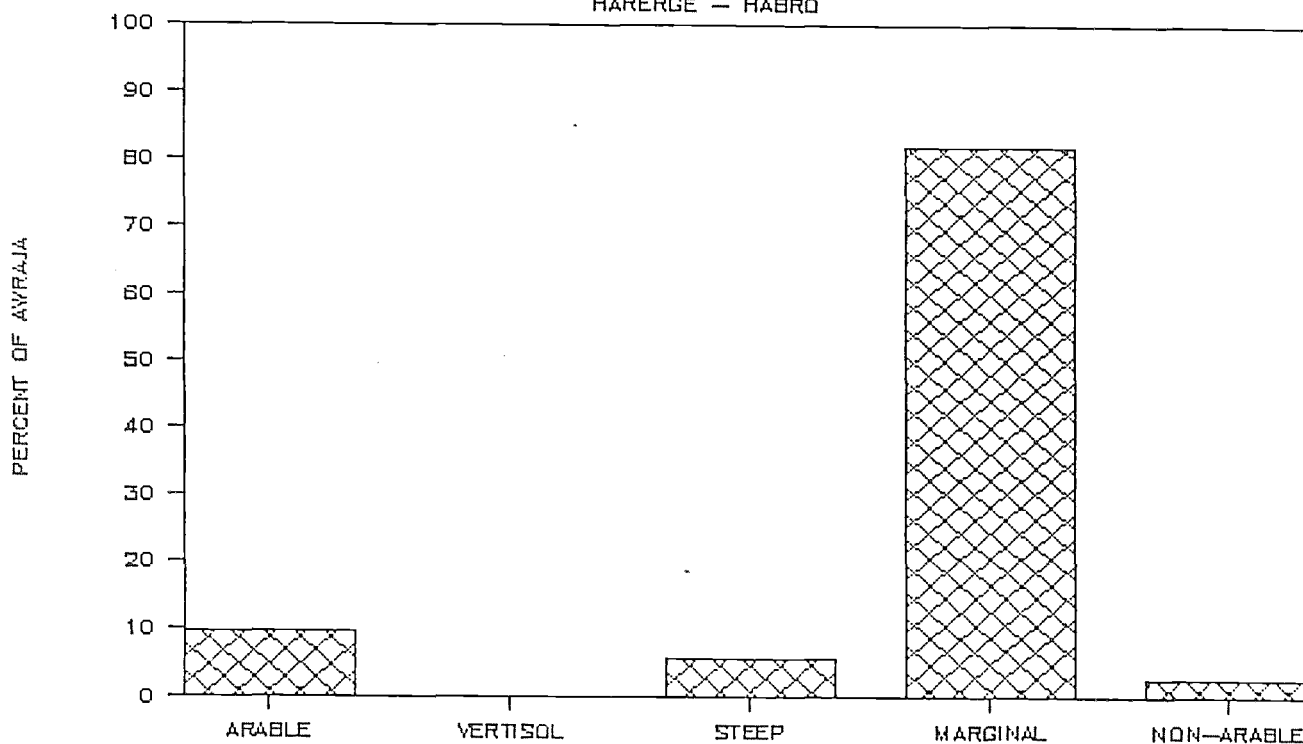
LAND MANAGEMENT CLASSES

HARERGE - WEBERA



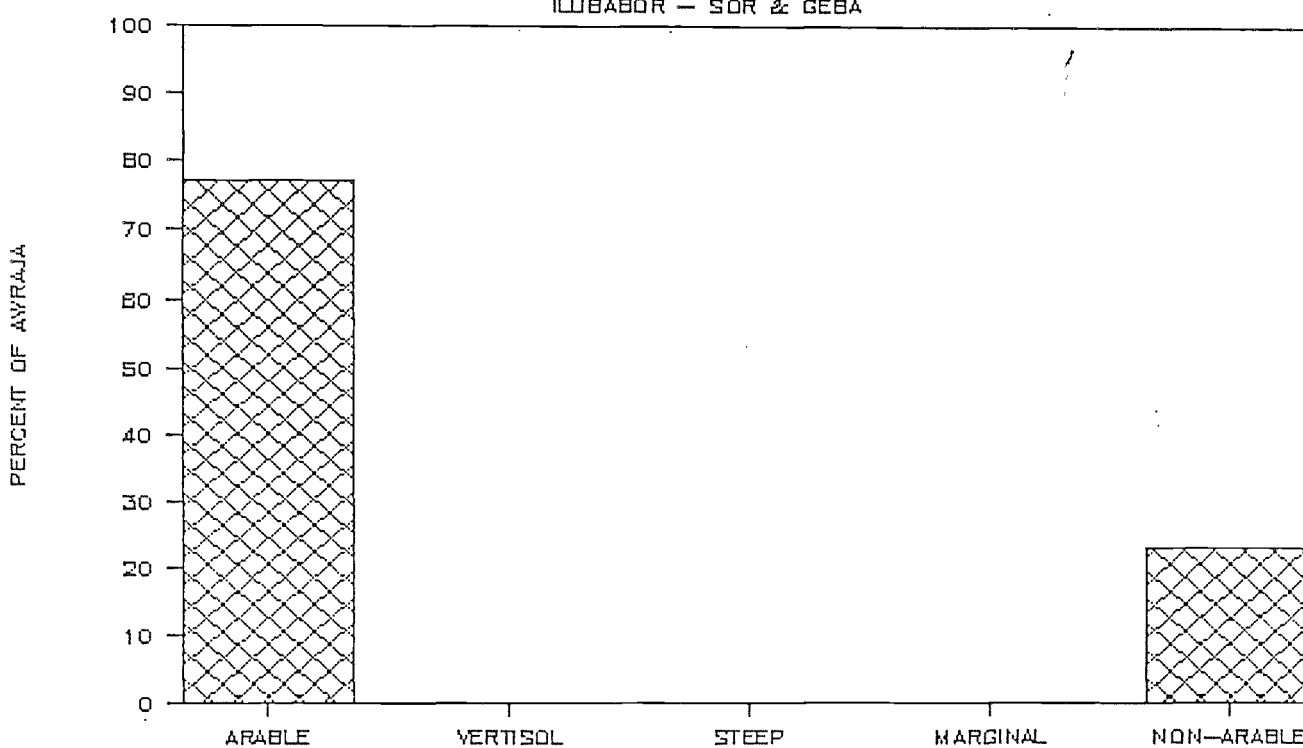
LAND MANAGEMENT CLASSES

HARERGE — HABRO



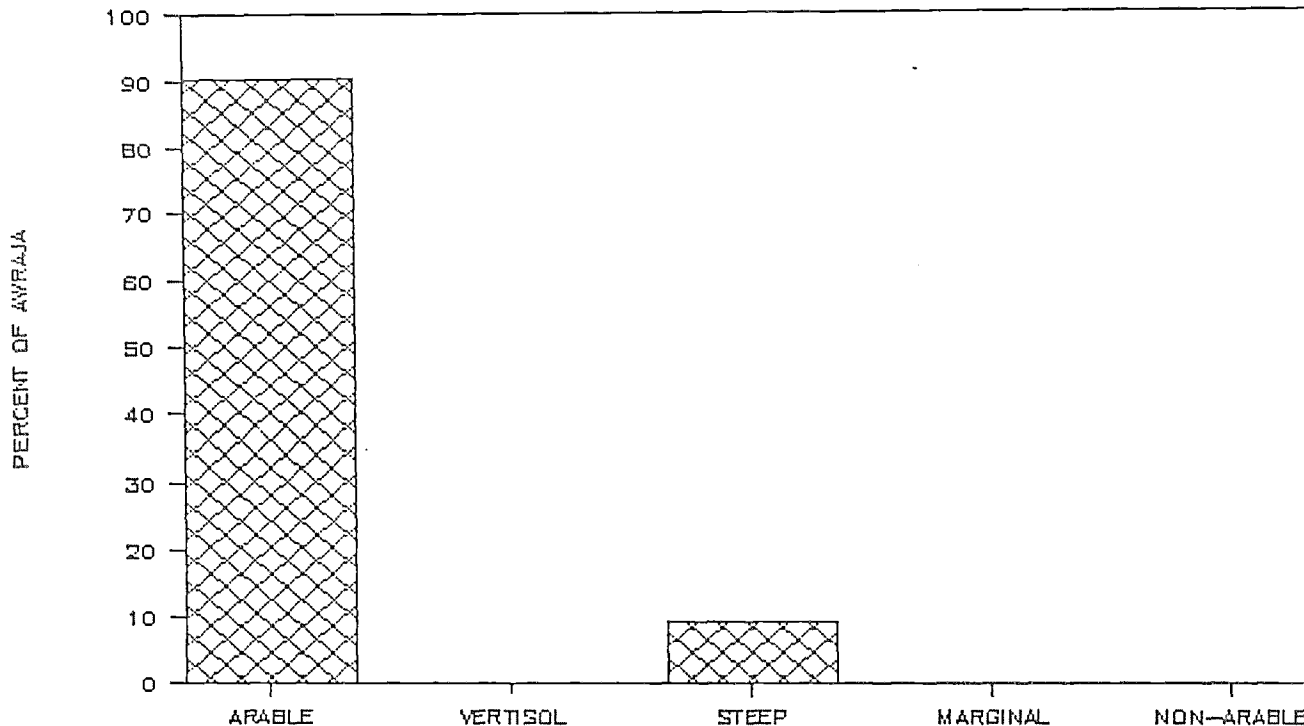
LAND MANAGEMENT CLASSES

ILJIBABOR — SOR & GEBÄ



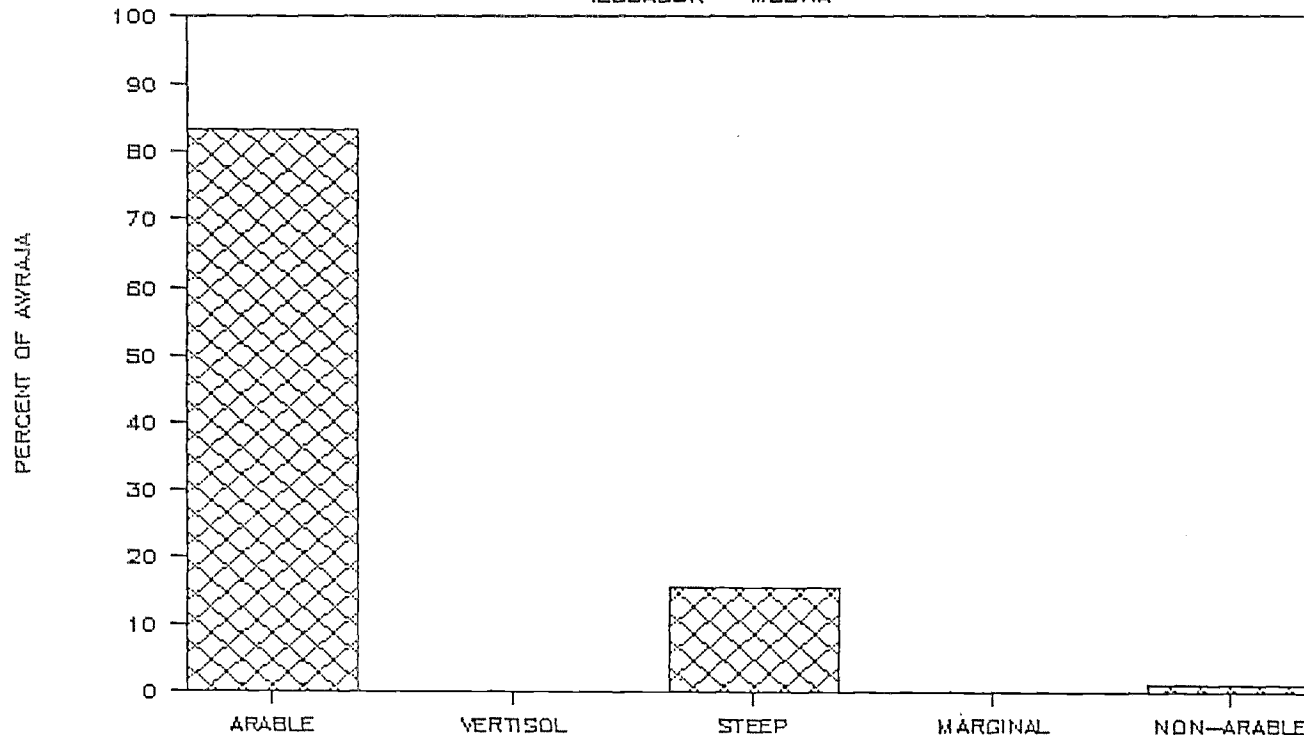
LAND MANAGEMENT CLASSES

ILUBABOR - GORE



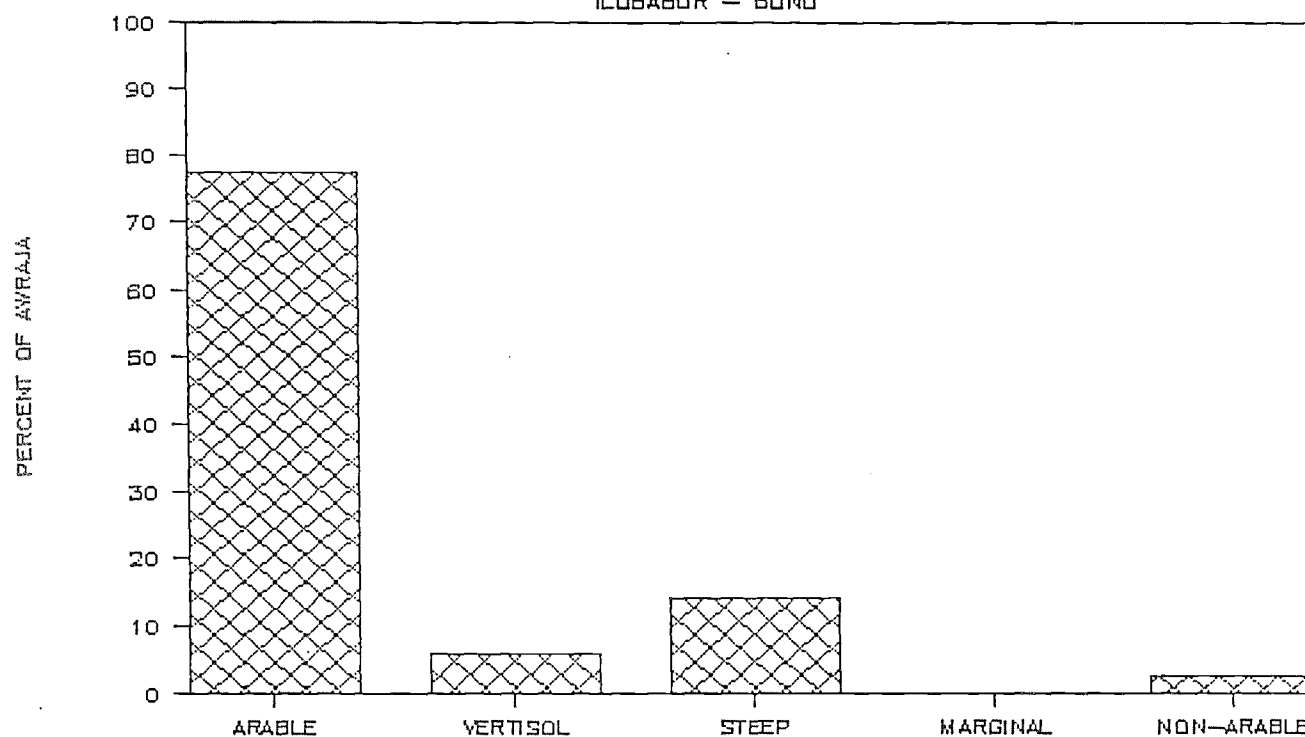
LAND MANAGEMENT CLASSES

ILUBABOR - MOCHA



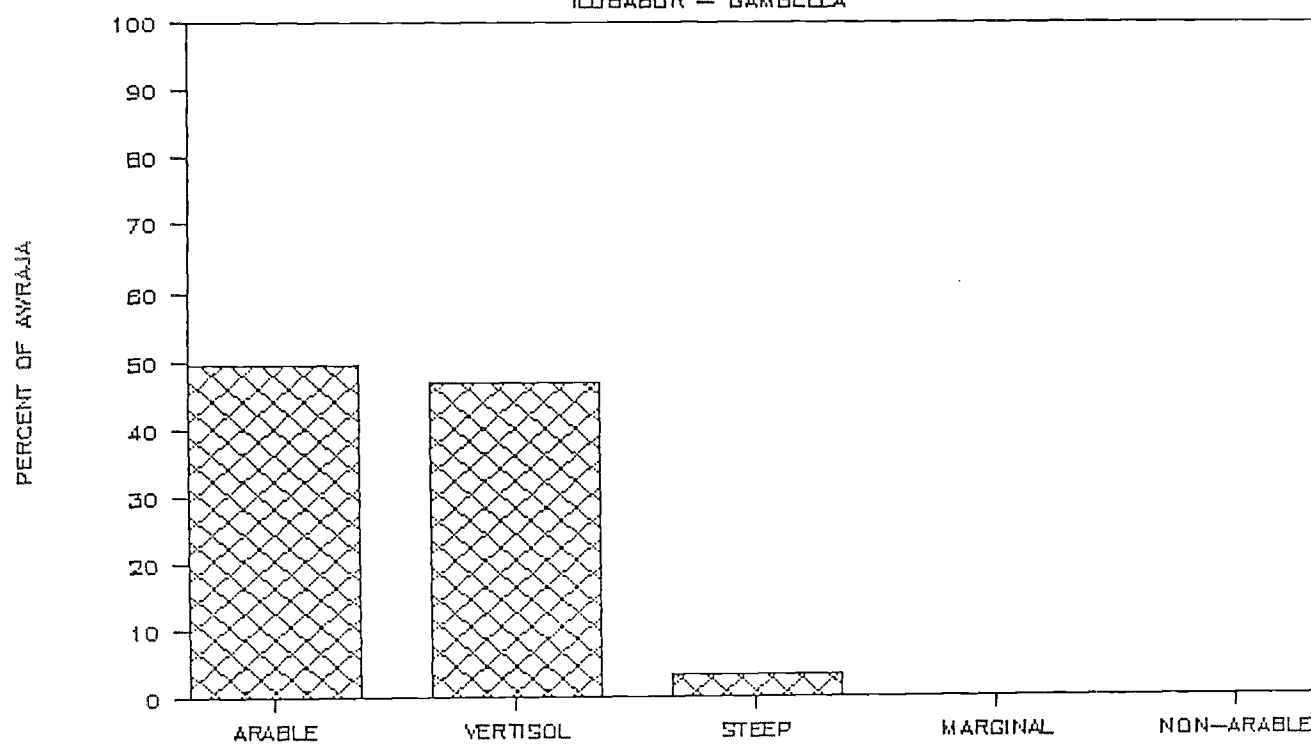
LAND MANAGEMENT CLASSES

ILUBABOR - BUNO



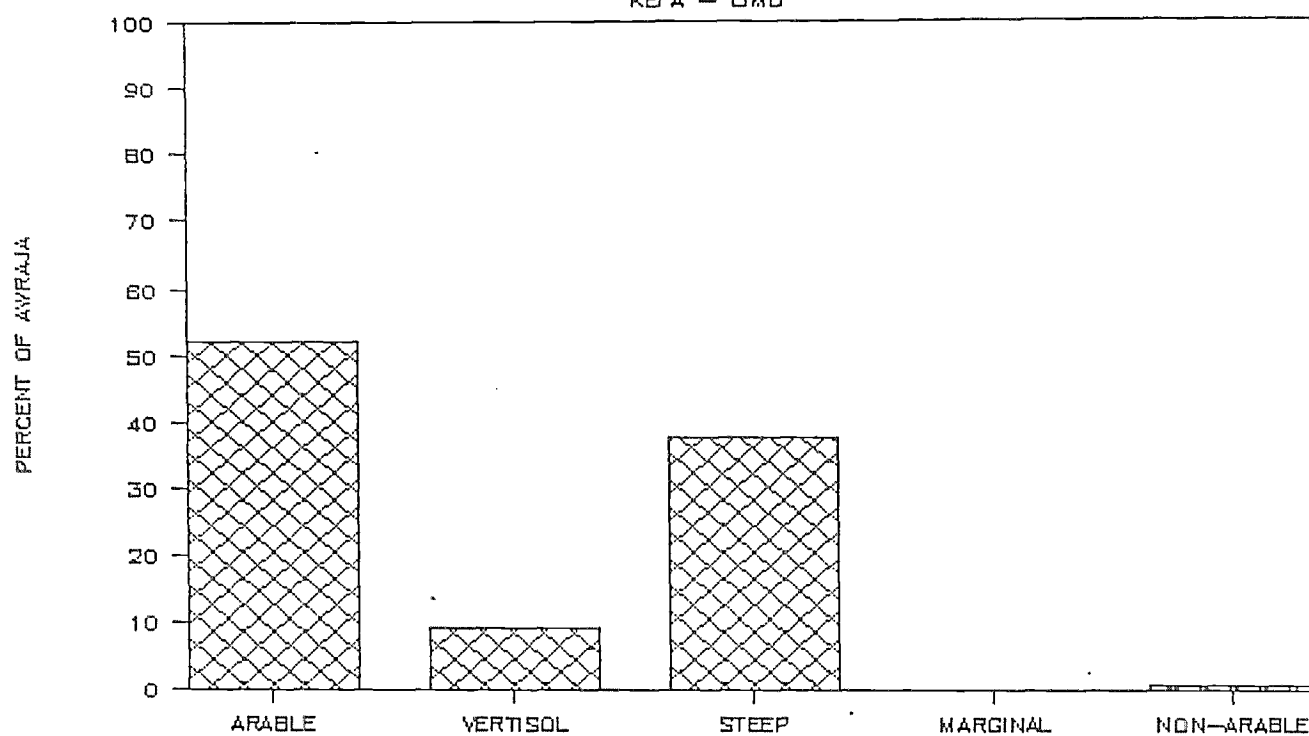
LAND MANAGEMENT CLASSES

ILUBABOR - GAMBELLA



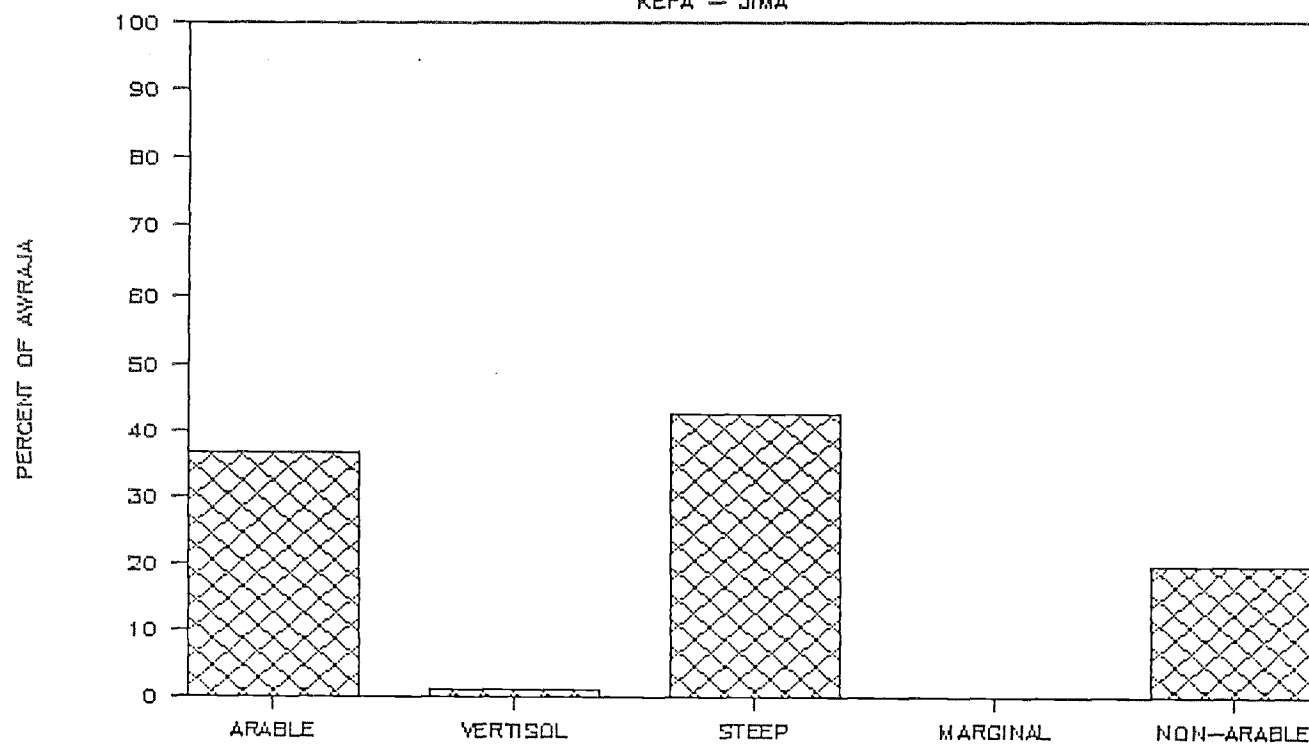
LAND MANAGEMENT CLASSES

KEFA - UMU



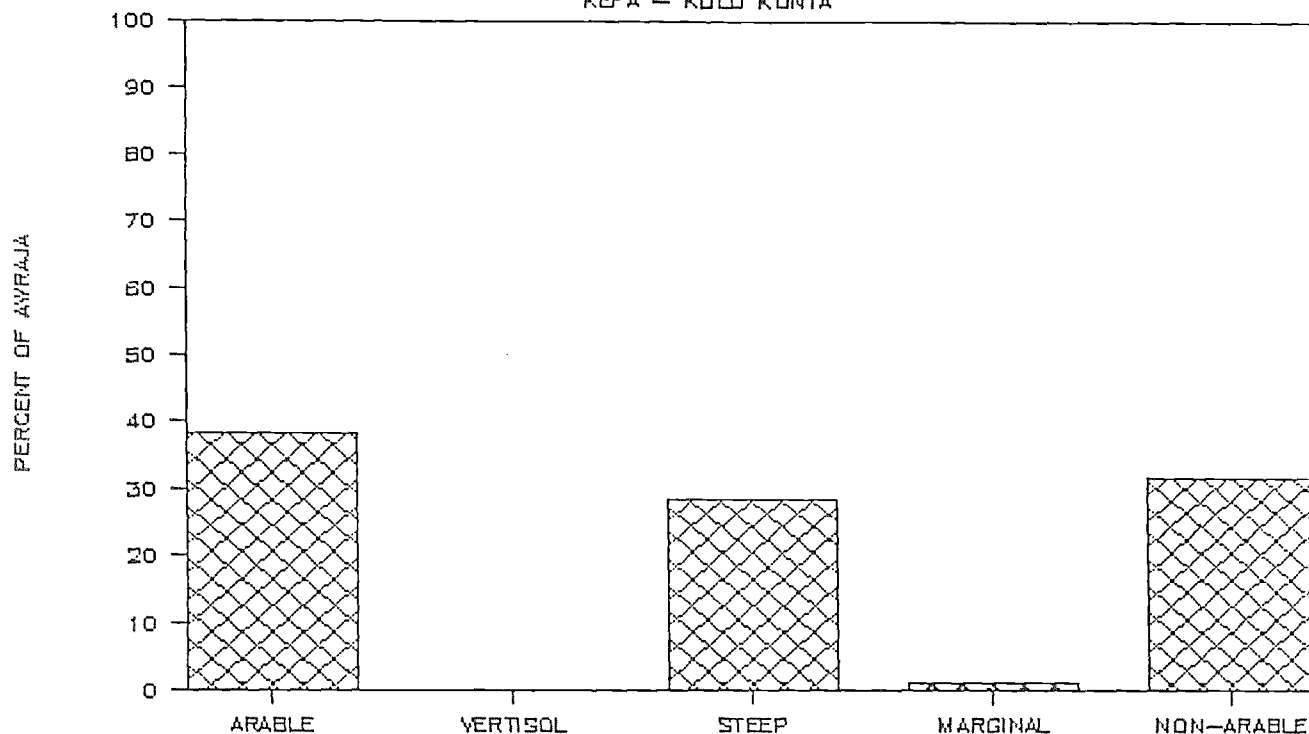
LAND MANAGEMENT CLASSES

KEFA - JIMA



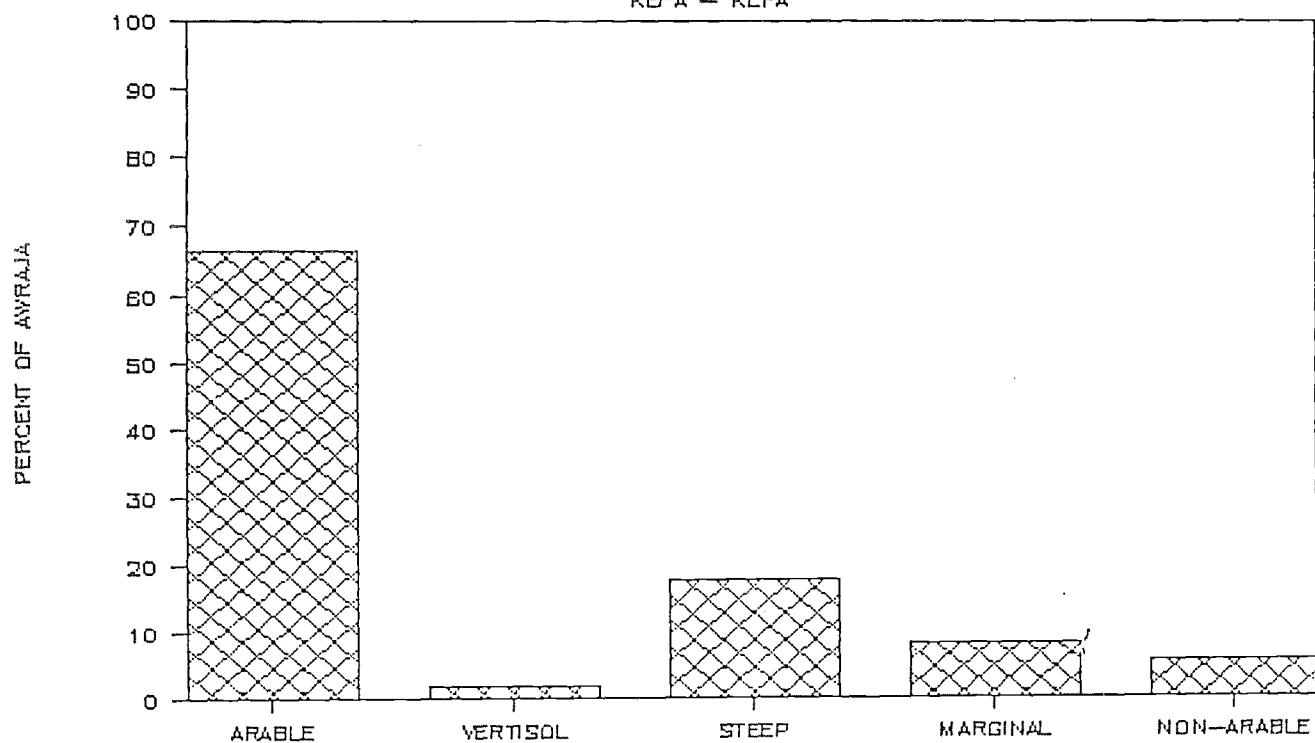
LAND MANAGEMENT CLASSES

KEFA - KULO KONTA



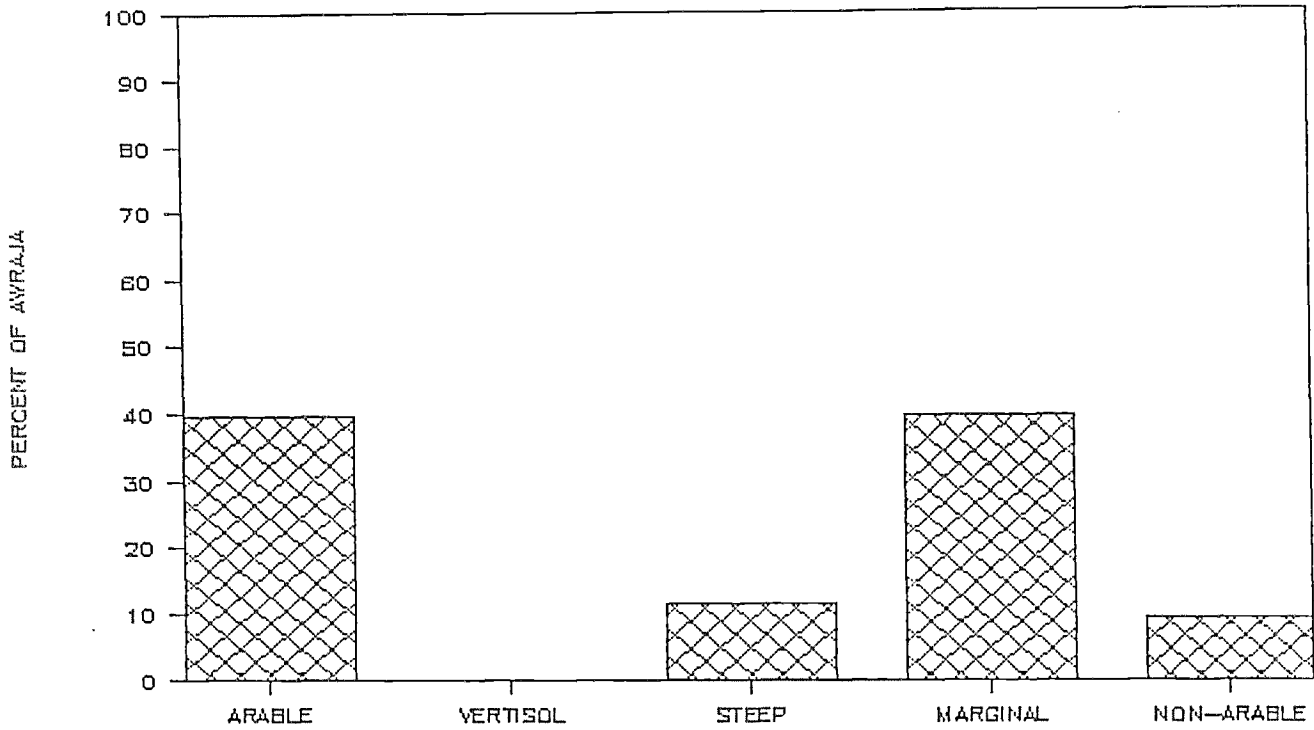
LAND MANAGEMENT CLASSES

KEFA - KEFA



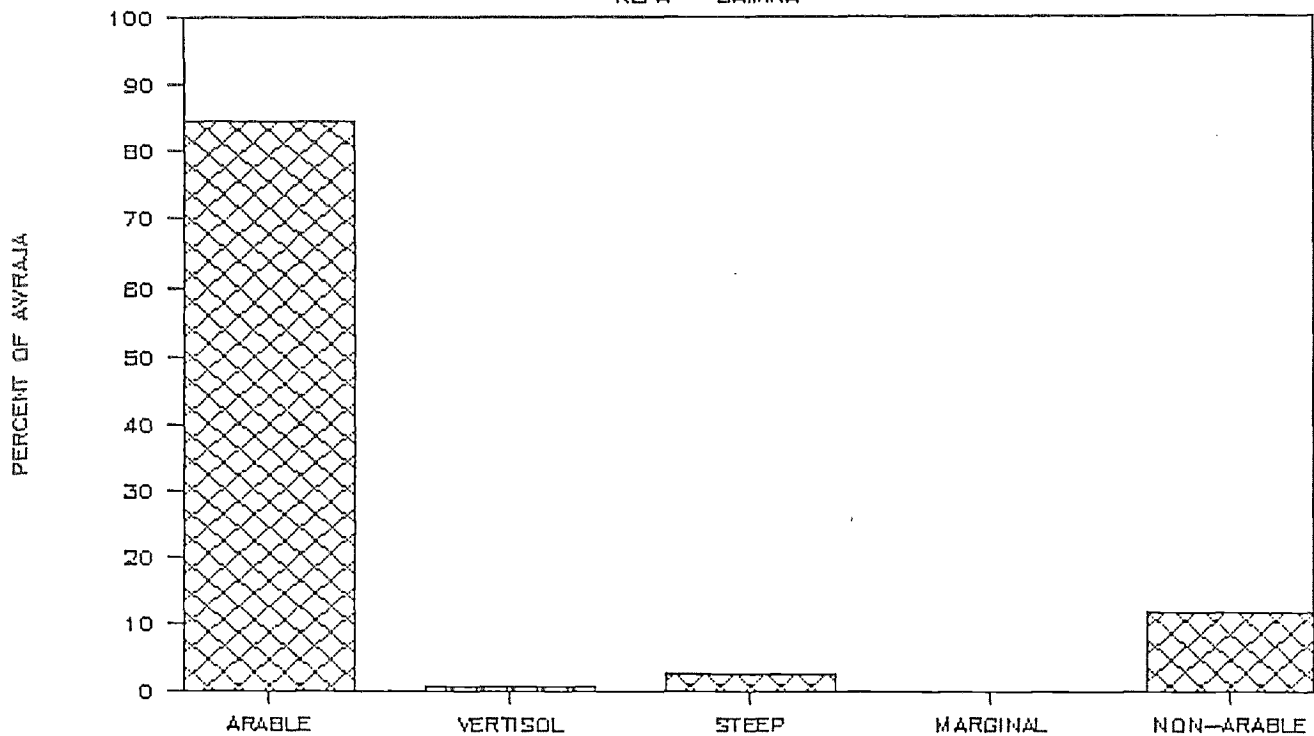
LAND MANAGEMENT CLASSES

KEFA - MAJI & GOLDIYA



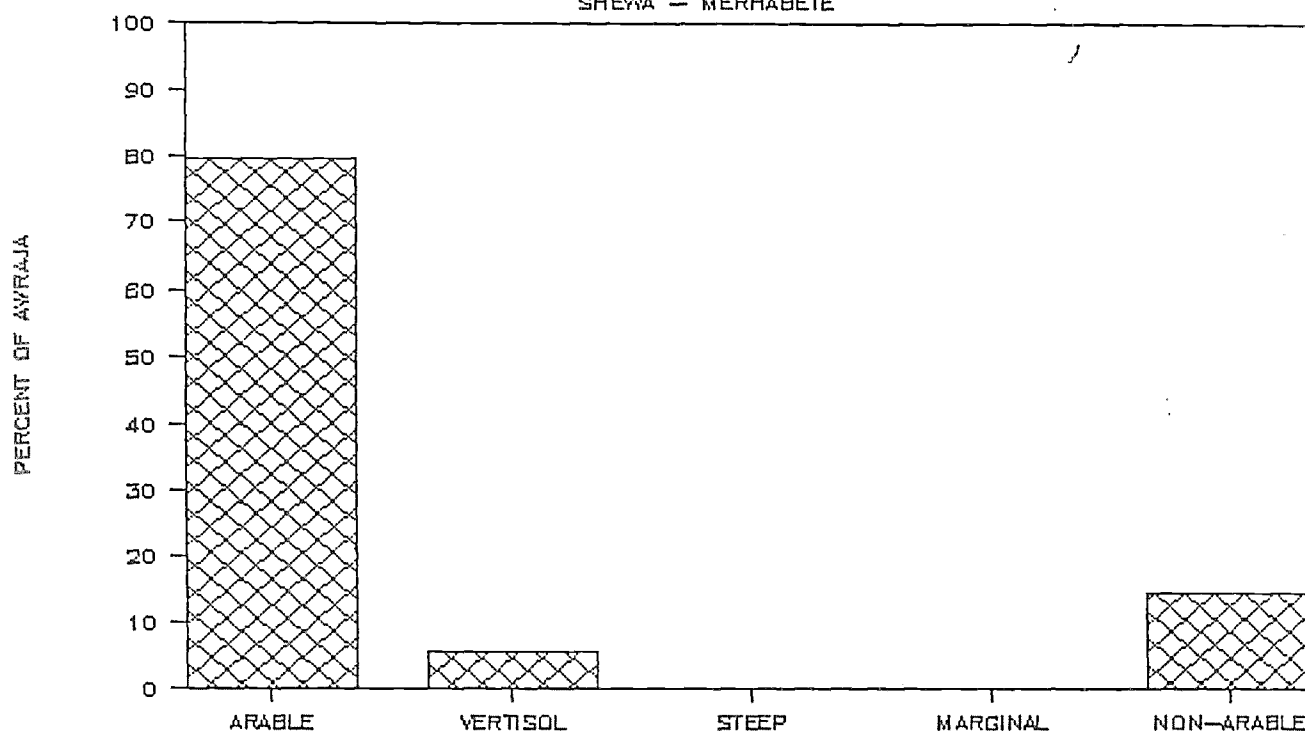
LAND MANAGEMENT CLASSES

KEFA - GAMIRA



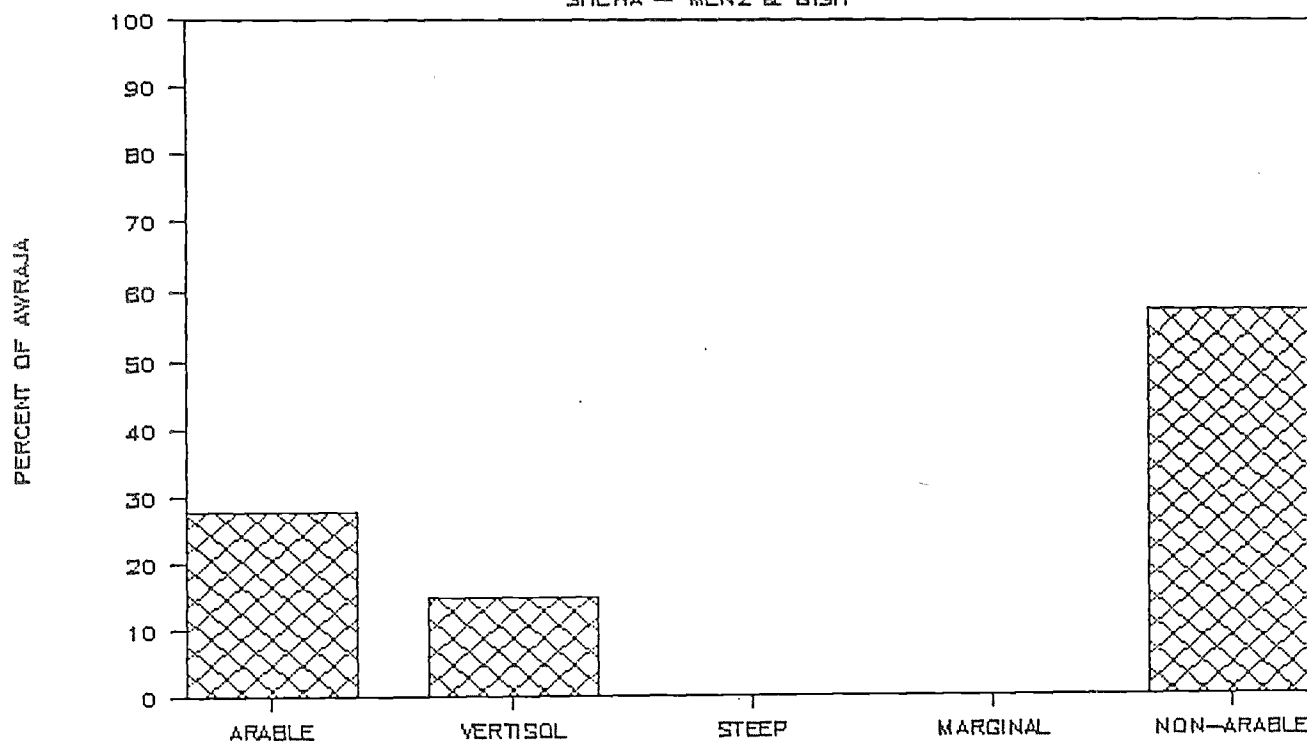
LAND MANAGEMENT CLASSES

SHEWA - MERHABETE



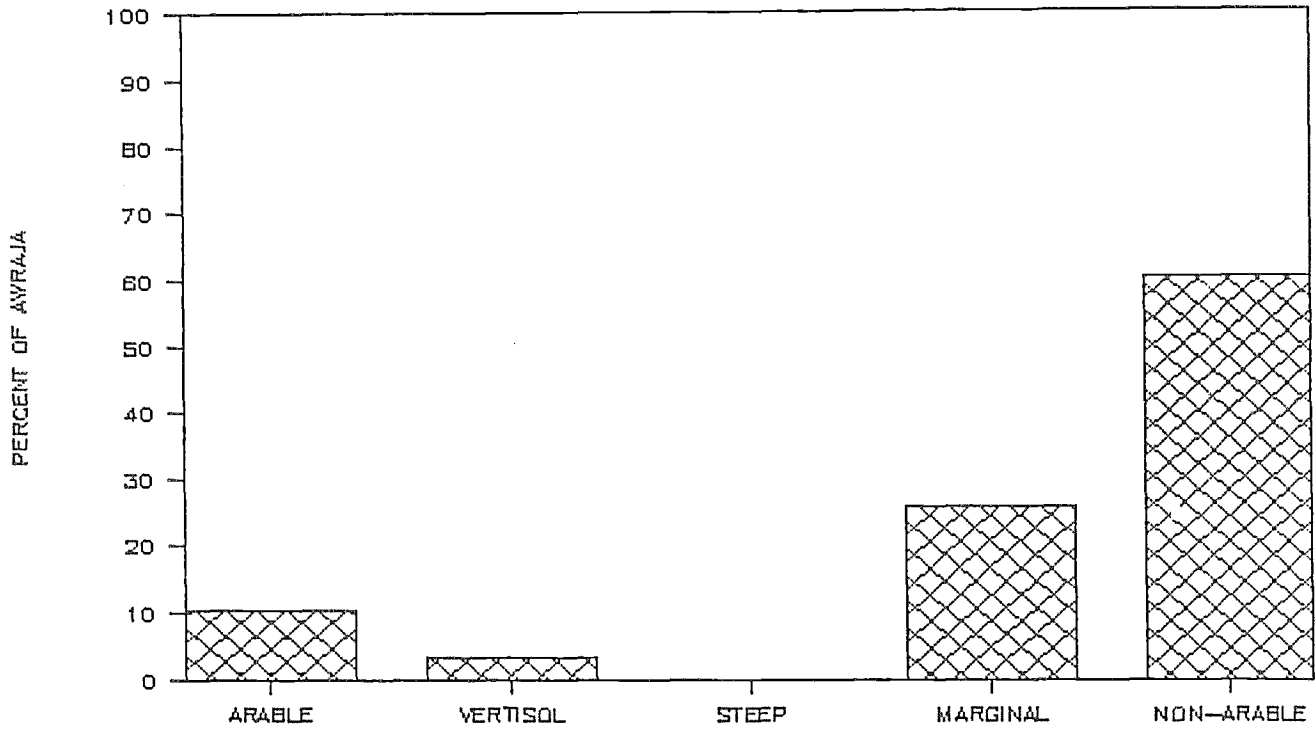
LAND MANAGEMENT CLASSES

SHEWA - MENZ & GISH



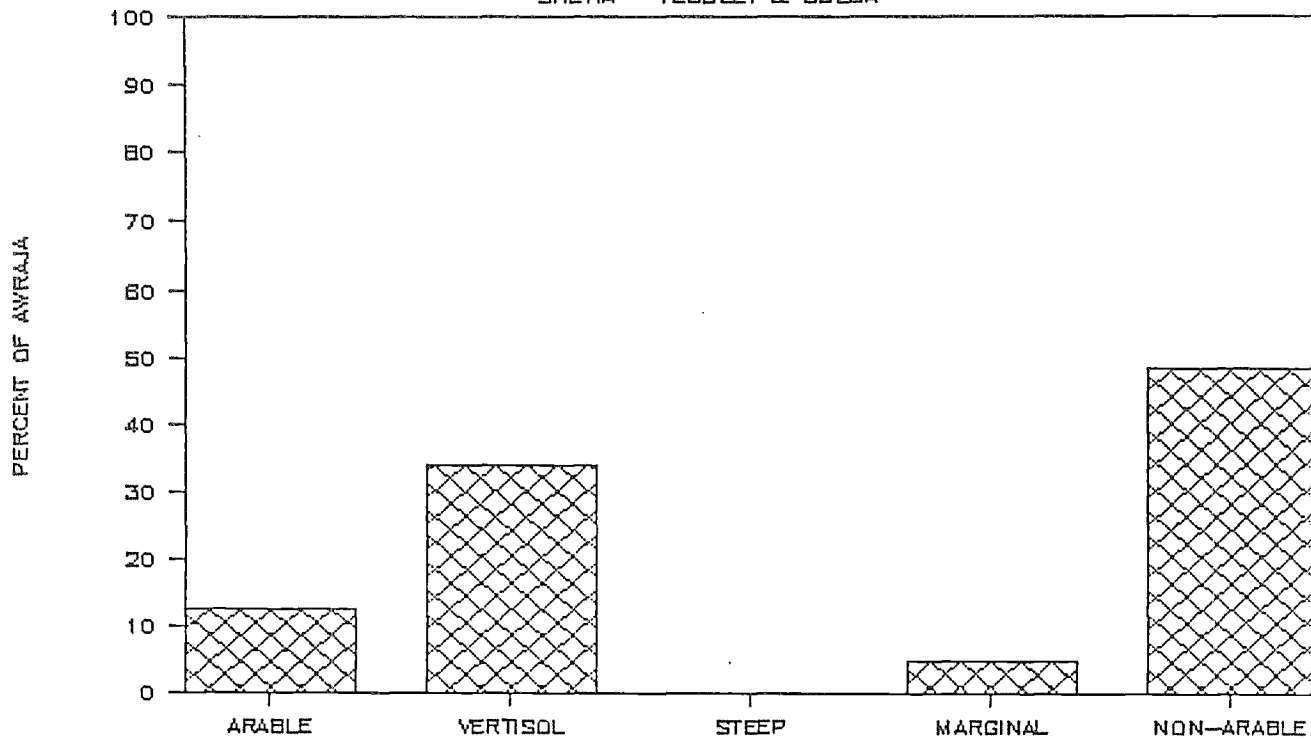
LAND MANAGEMENT CLASSES

SHEWA — YIFAT & TIMUGA



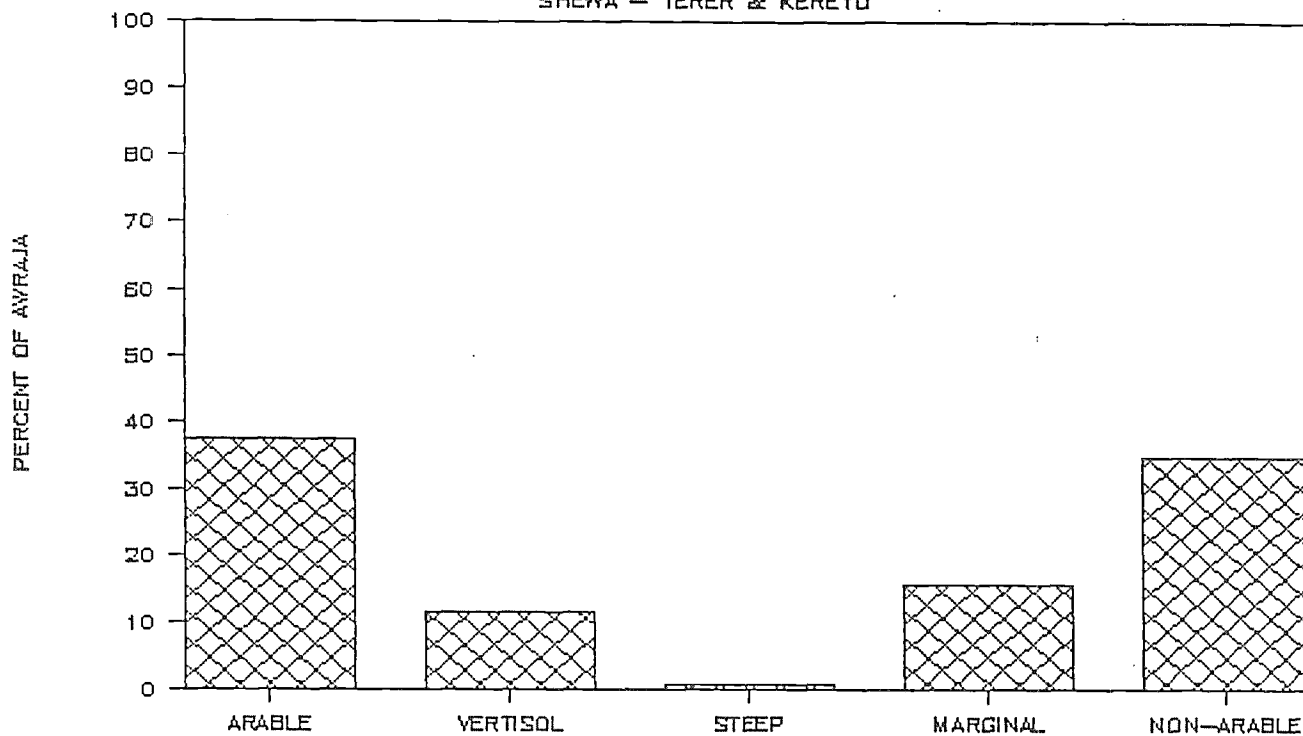
LAND MANAGEMENT CLASSES

SHEWA — TEGULET & BULGA



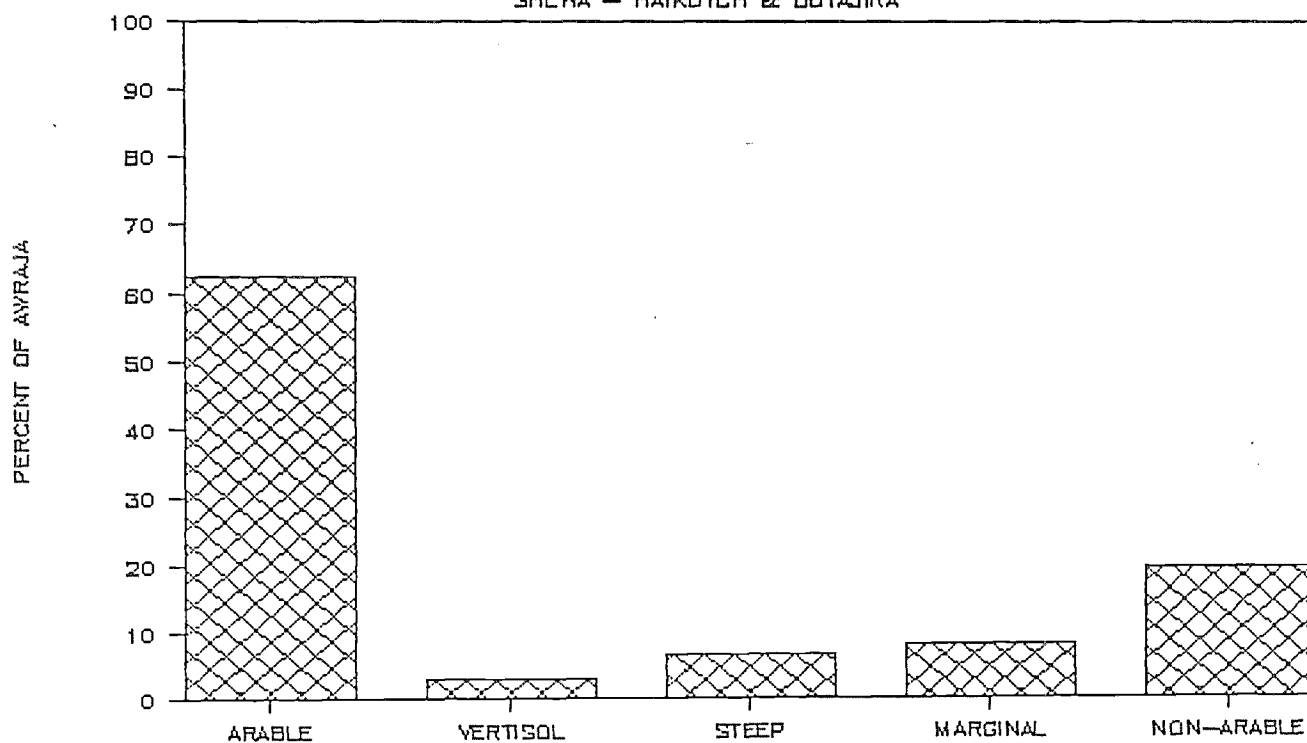
LAND MANAGEMENT CLASSES

SHEWA — YERER & KEREYU



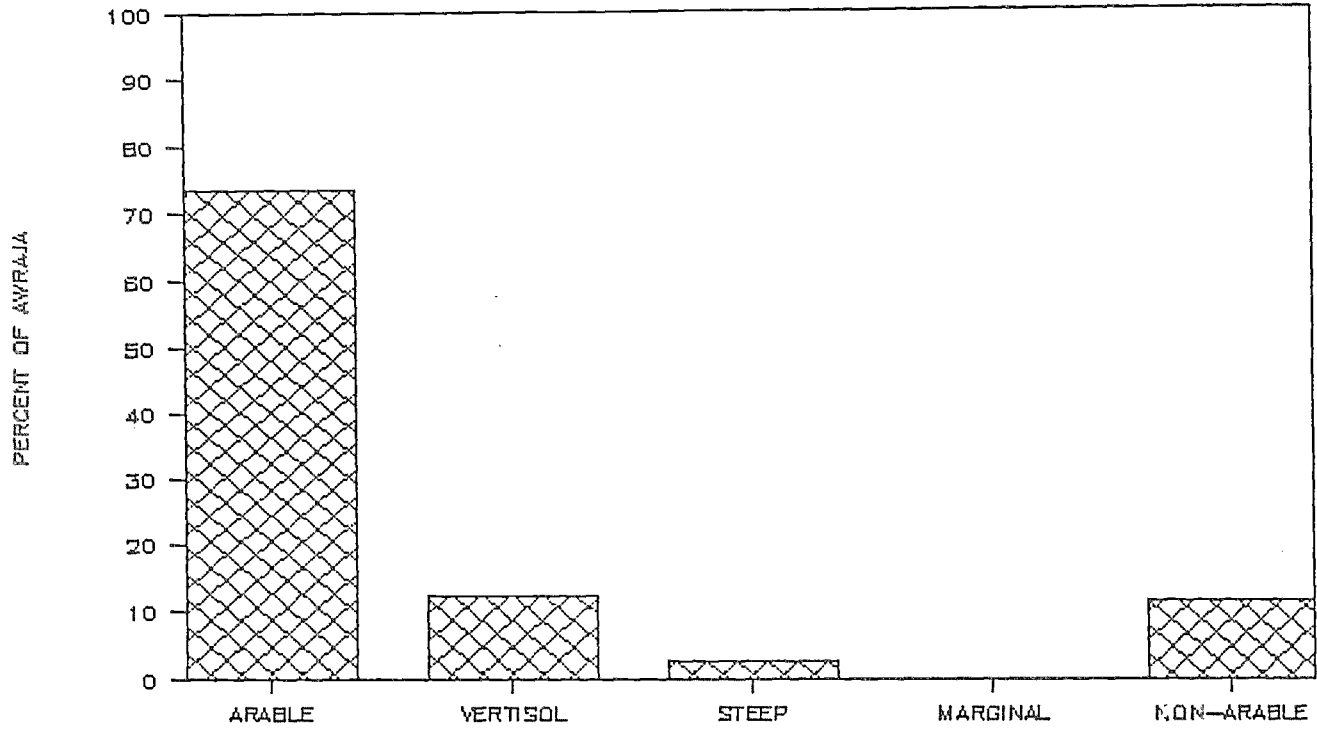
LAND MANAGEMENT CLASSES

SHEWA — HAIKOTCH & BUTAJIRA



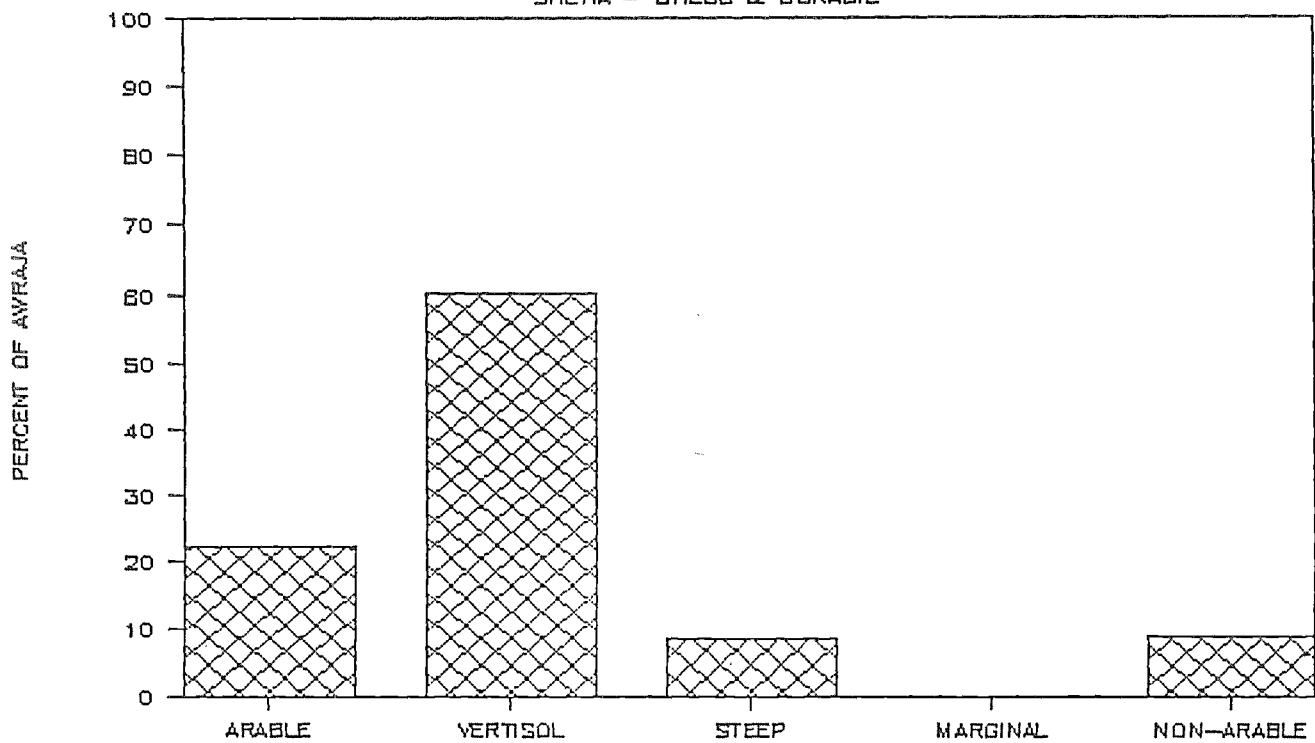
LAND MANAGEMENT CLASSES

SHEWA — KEMBATA & HADIYA



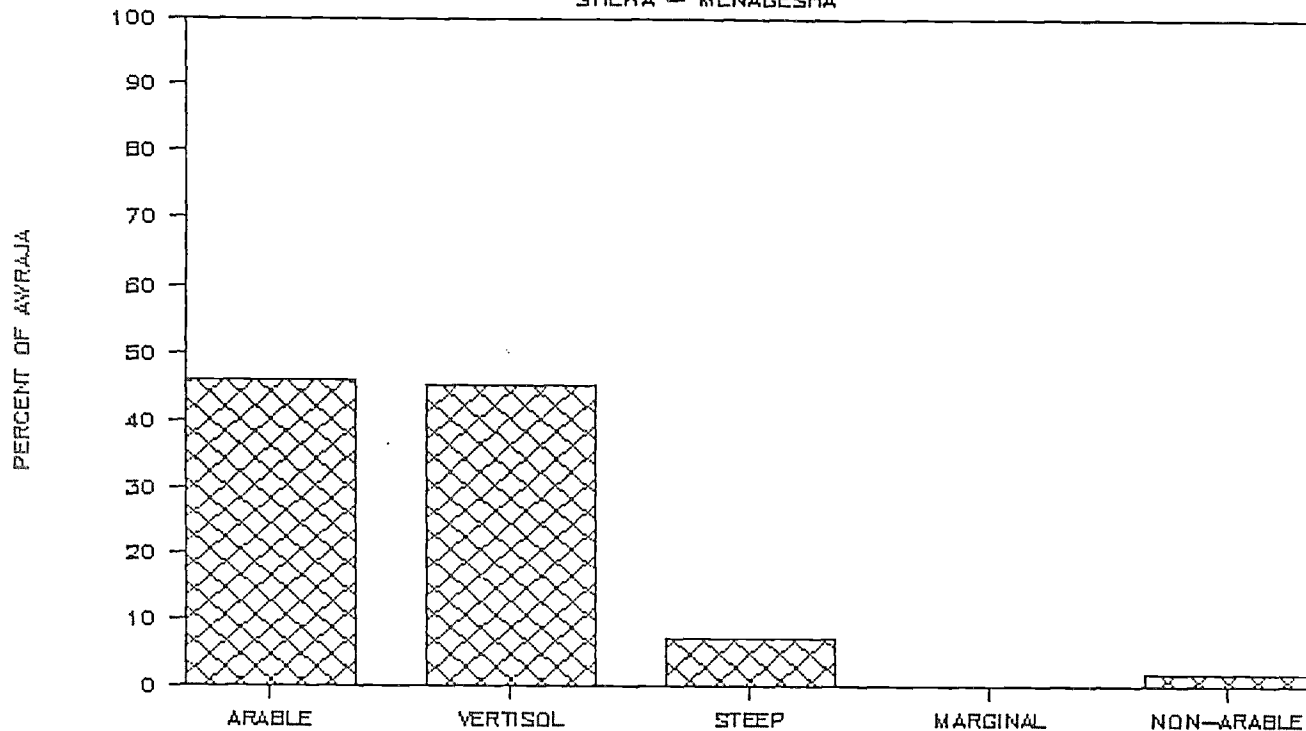
LAND MANAGEMENT CLASSES

SHEWA — CHEBO & GURAGIE



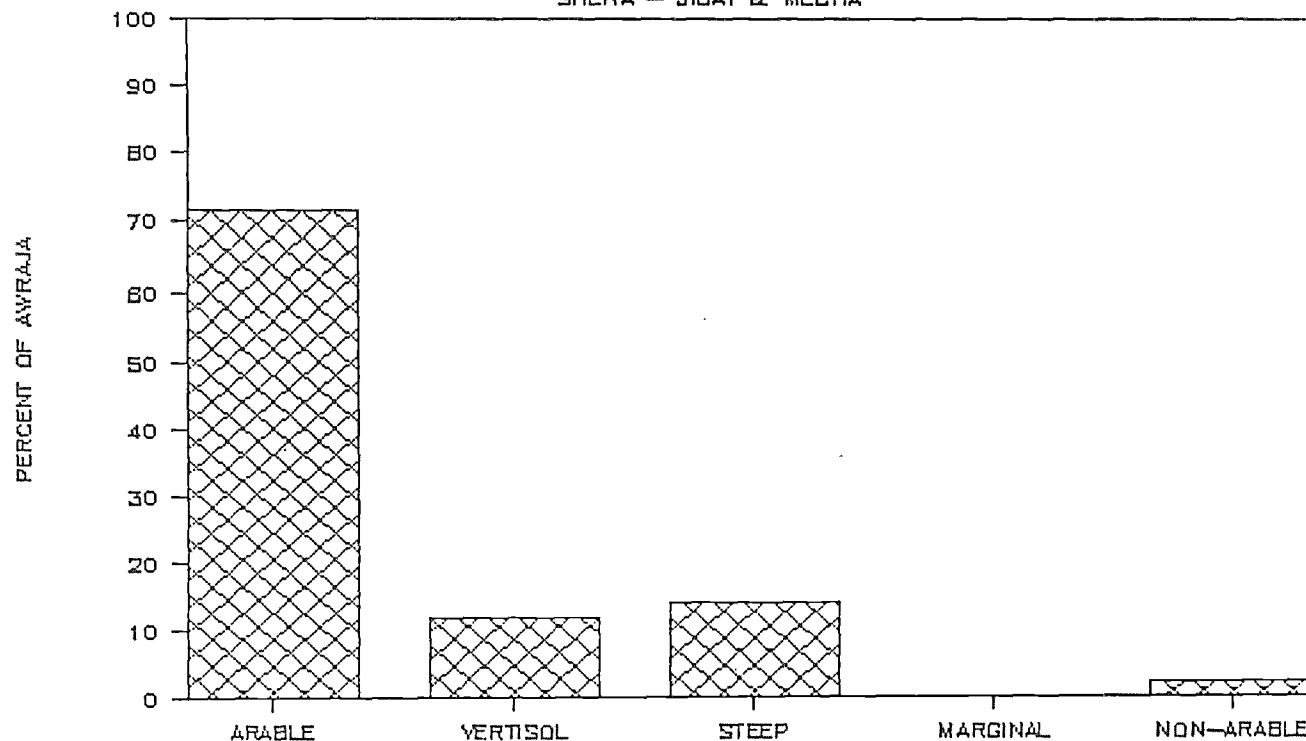
LAND MANAGEMENT CLASSES

SHEWA — MENAGESHA



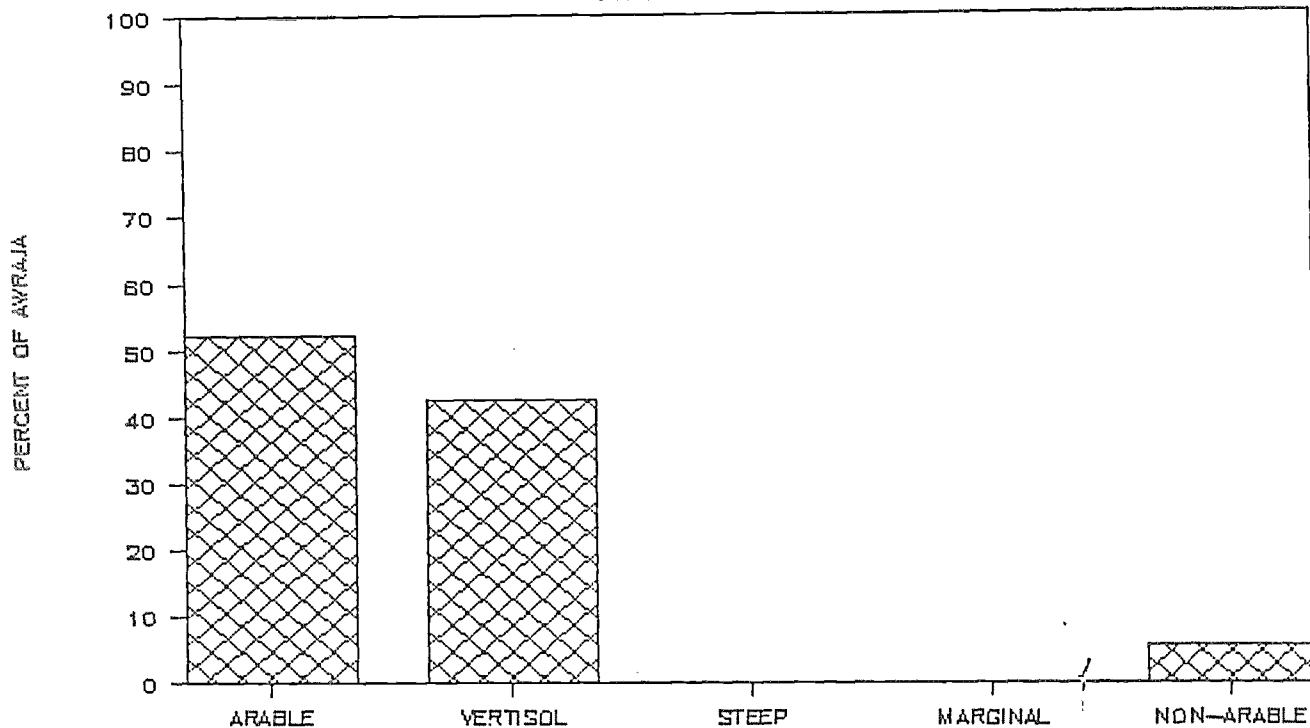
LAND MANAGEMENT CLASSES

SHEWA — JIBAT & MECHA



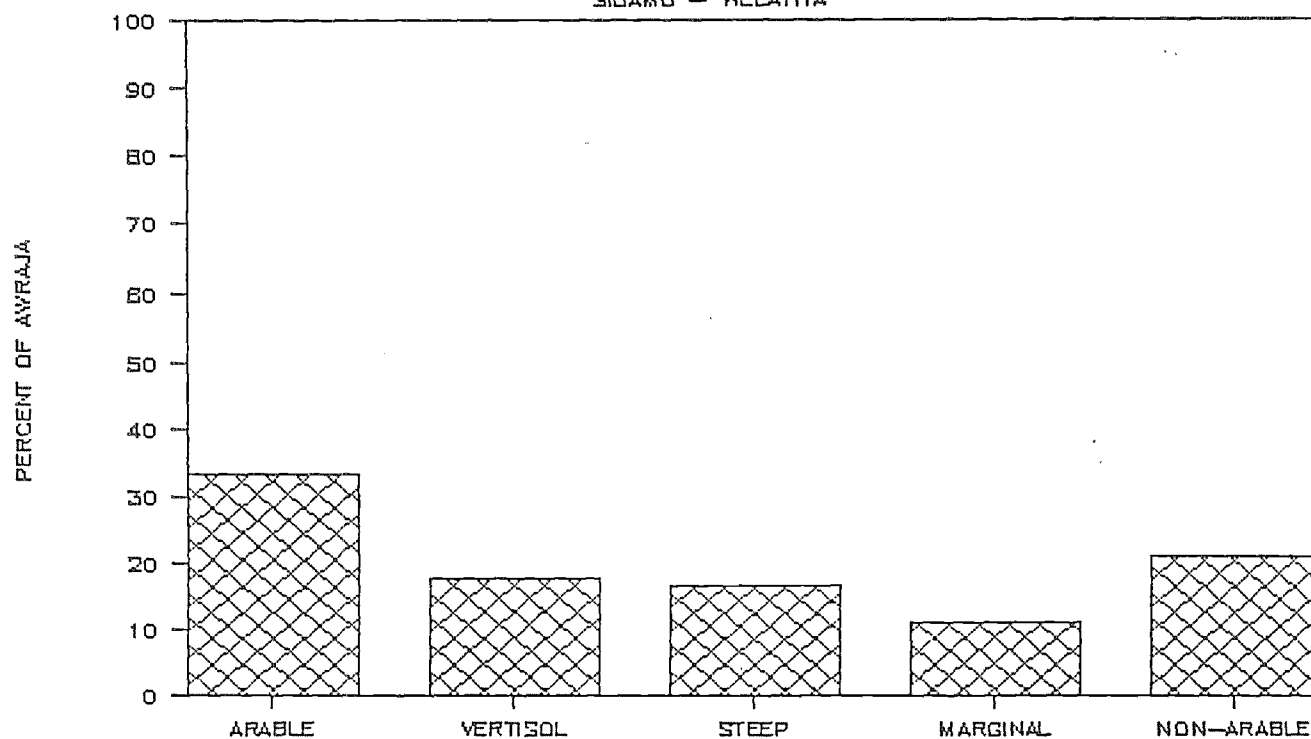
LAND MANAGEMENT CLASSES

SHEWA - SELALE



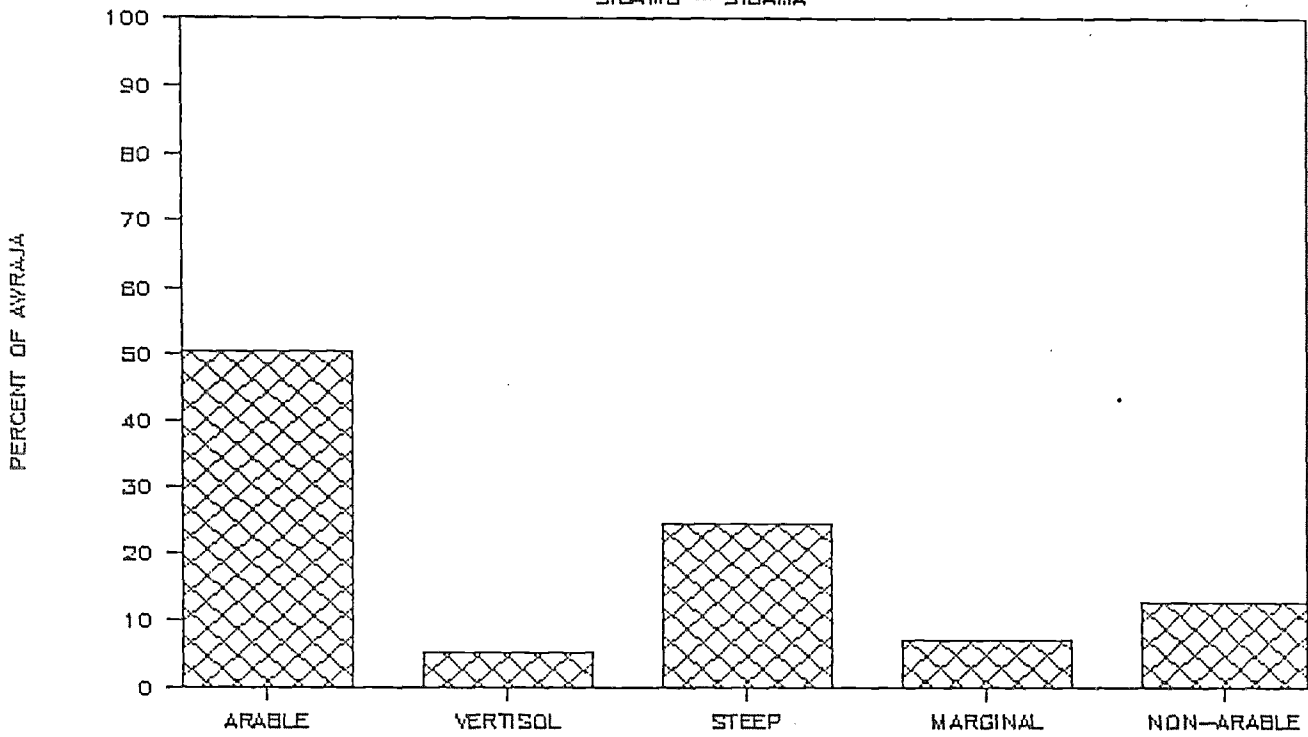
LAND MANAGEMENT CLASSES

SIDAMO - WELAYITA



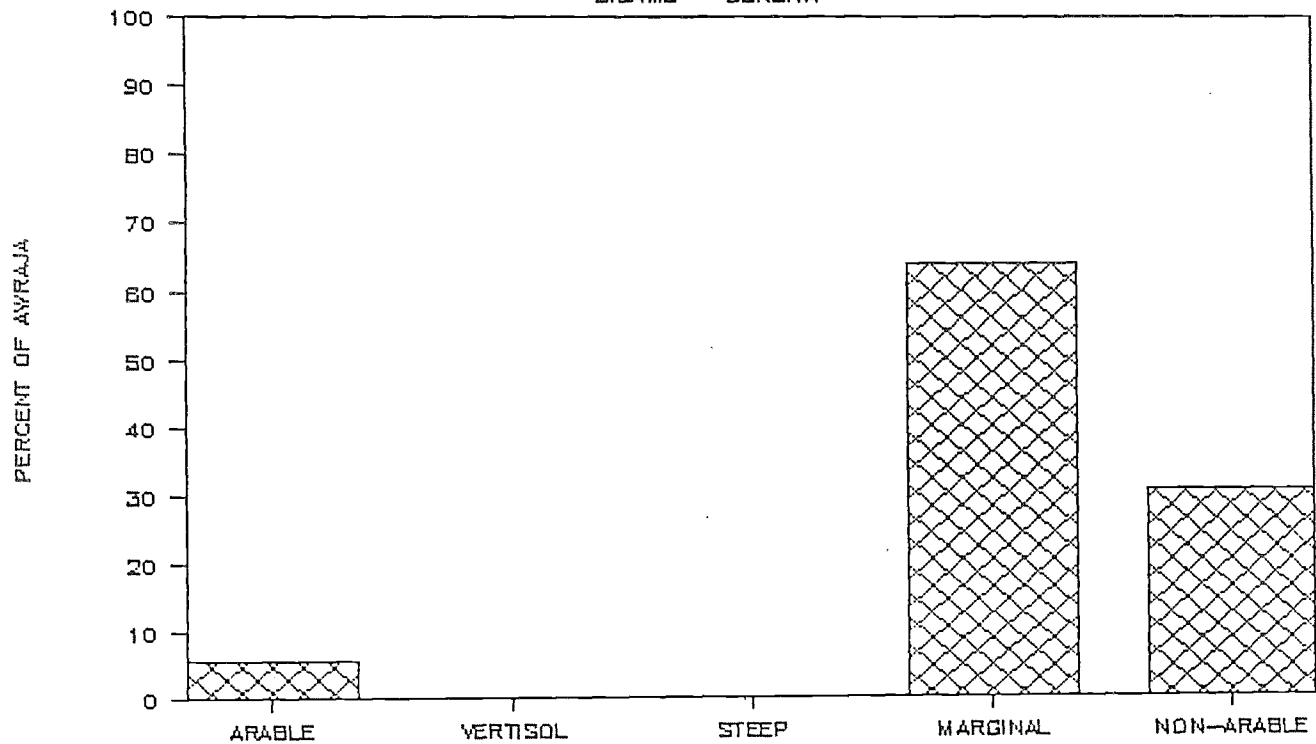
LAND MANAGEMENT CLASSES

SIDAMO - SIDAMA



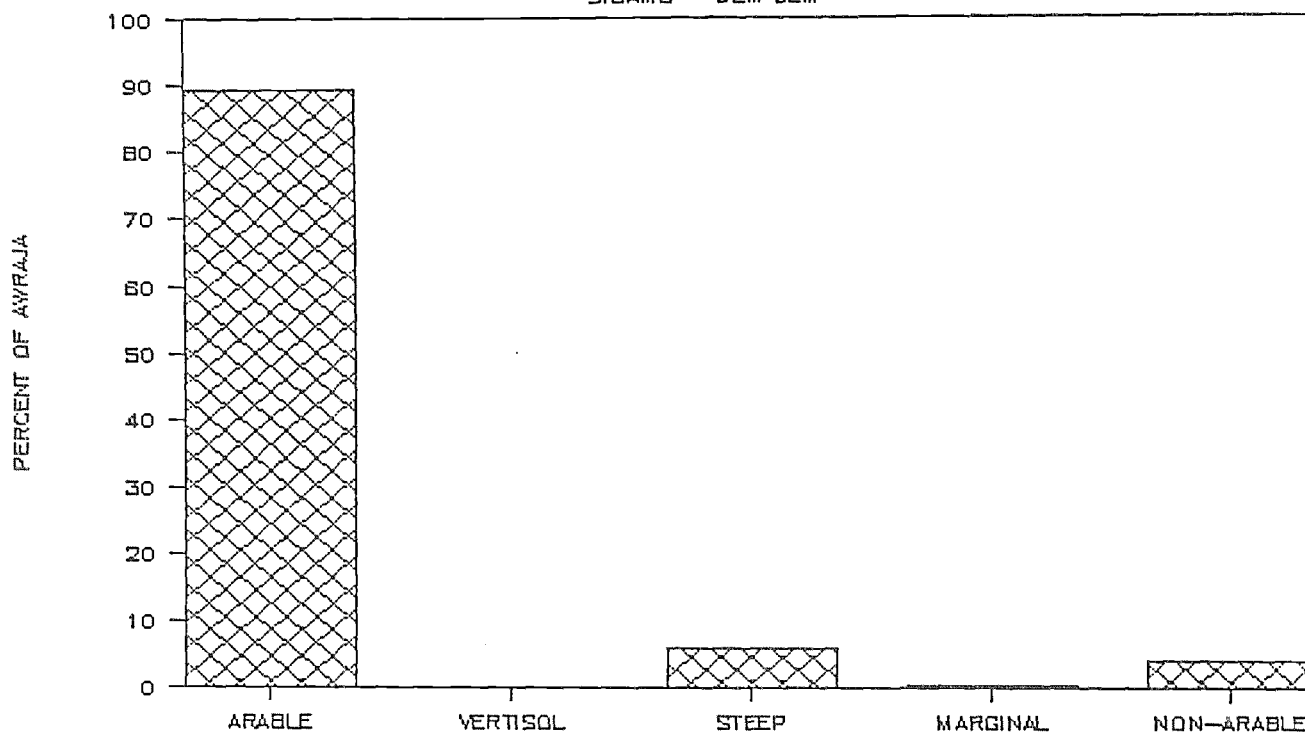
LAND MANAGEMENT CLASSES

SIDAMO - BORENA



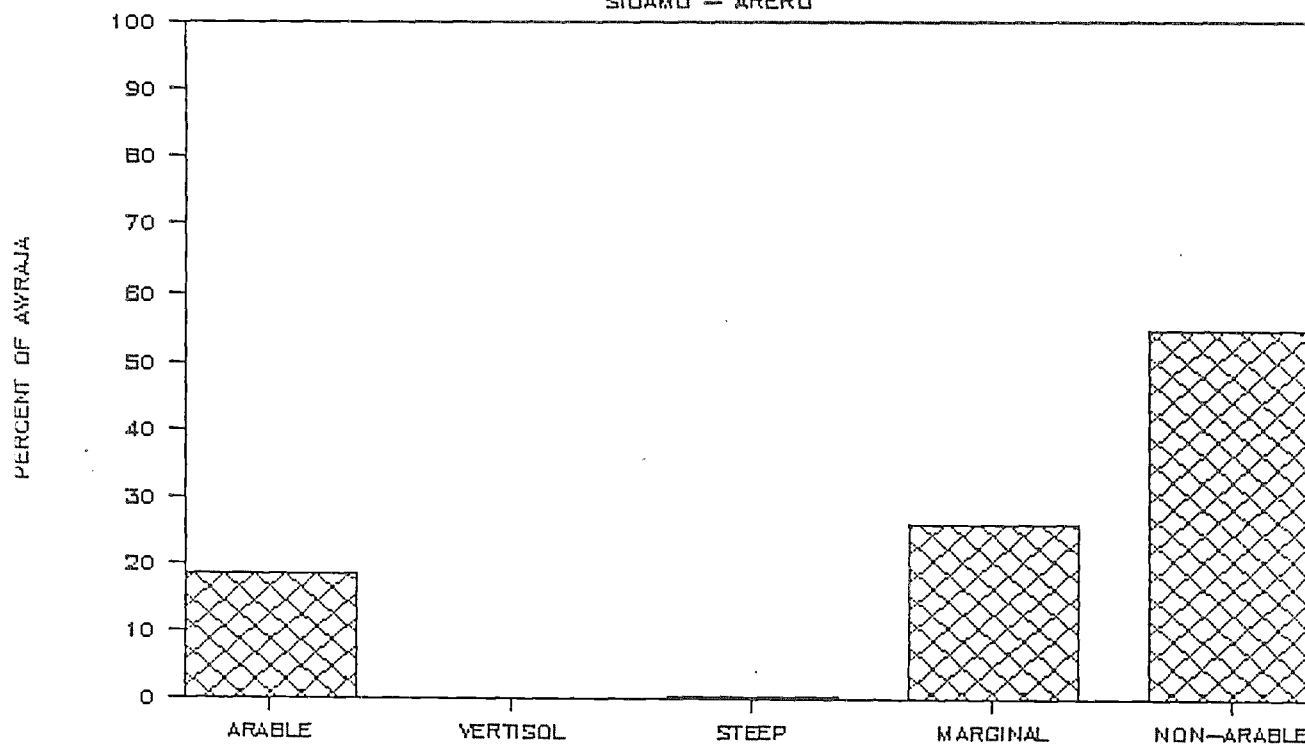
LAND MANAGEMENT CLASSES

SIDAMO - JEM JEM



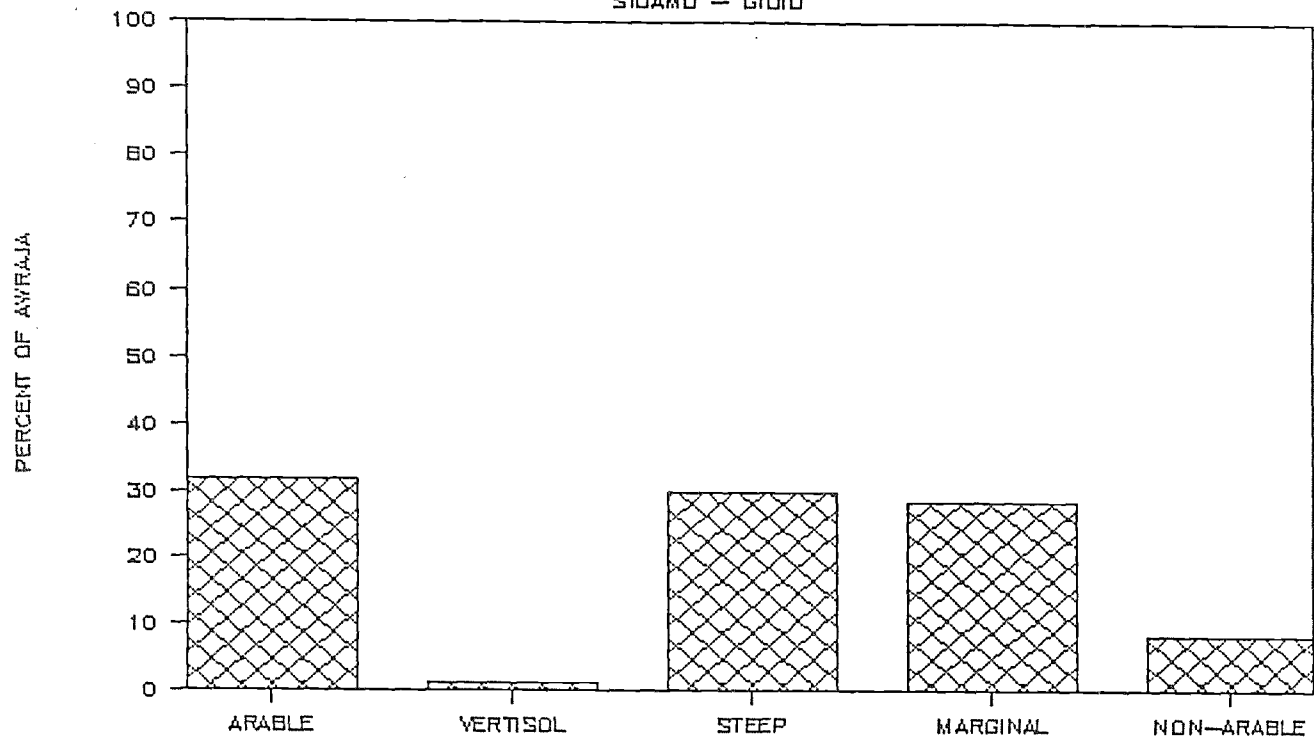
LAND MANAGEMENT CLASSES

SIDAMO - ARERO



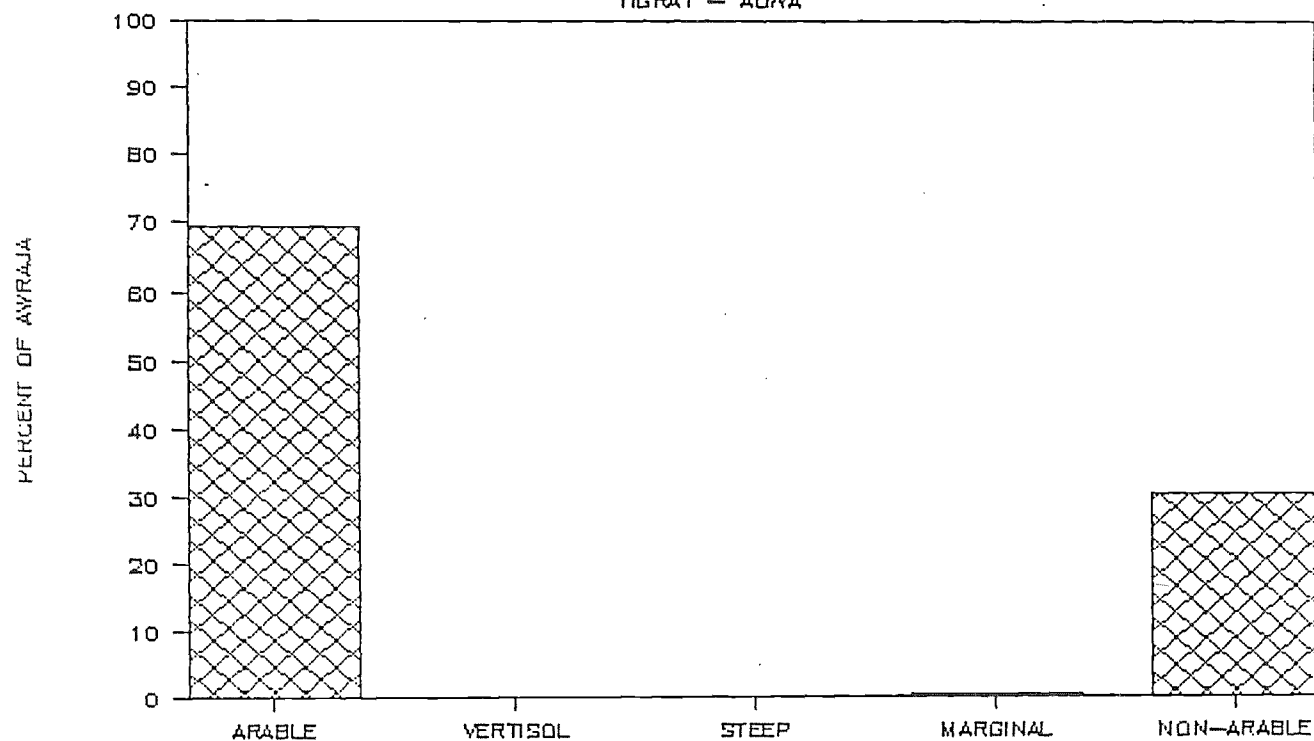
LAND MANAGEMENT CLASSES

SIDAMO - GIDIO



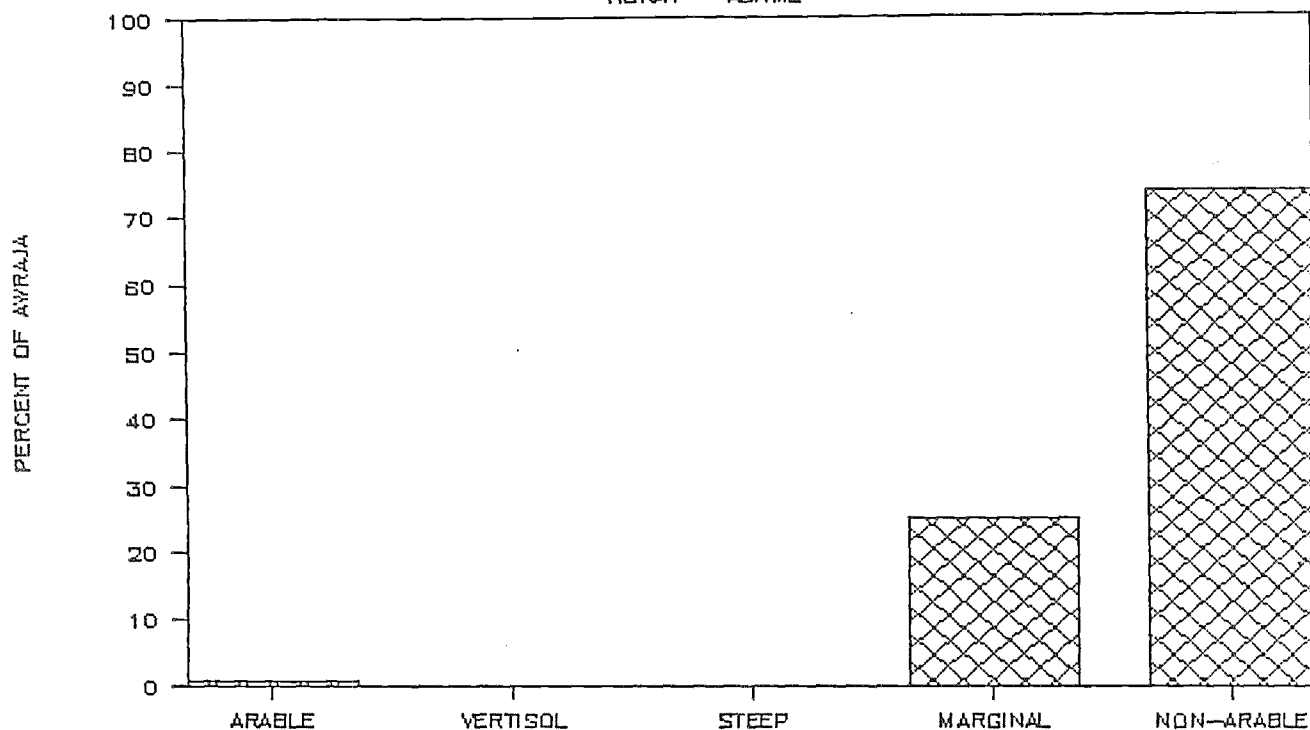
LAND MANAGEMENT CLASSES

TIGRAY - ADWA



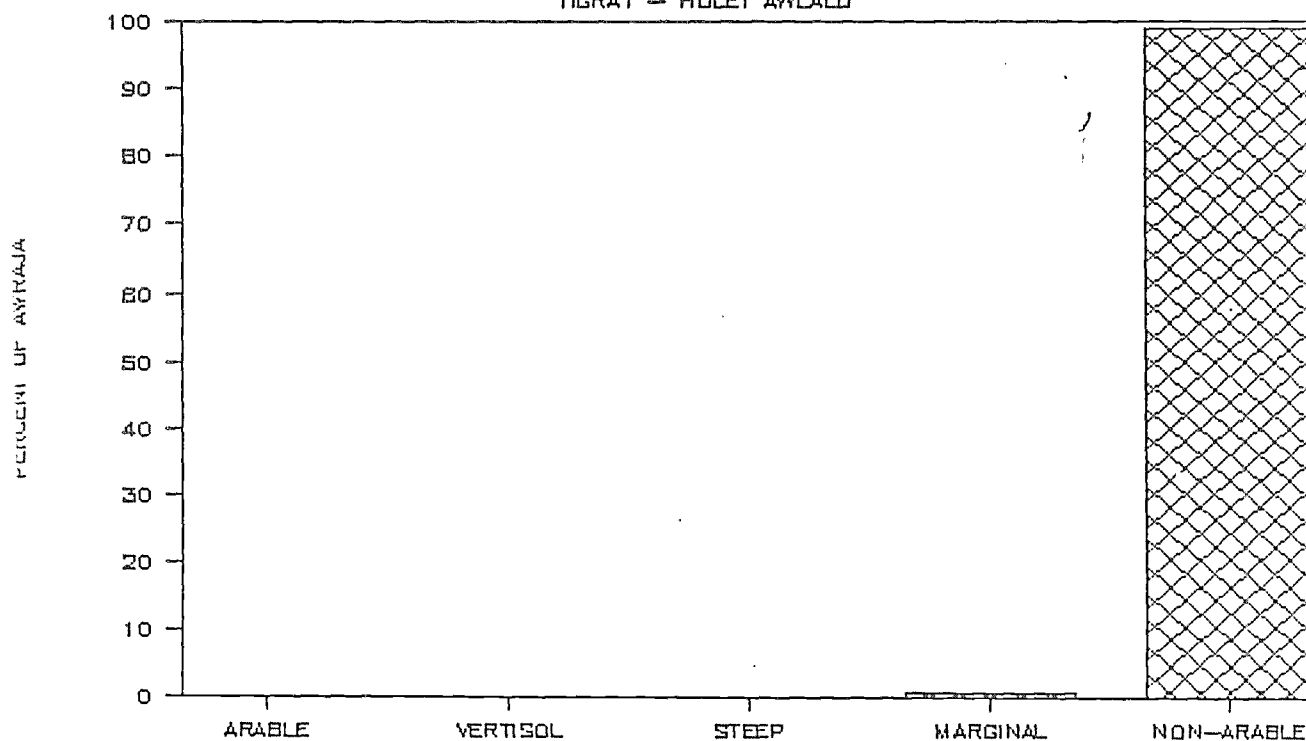
LAND MANAGEMENT CLASSES

TIGRAY - AGAME



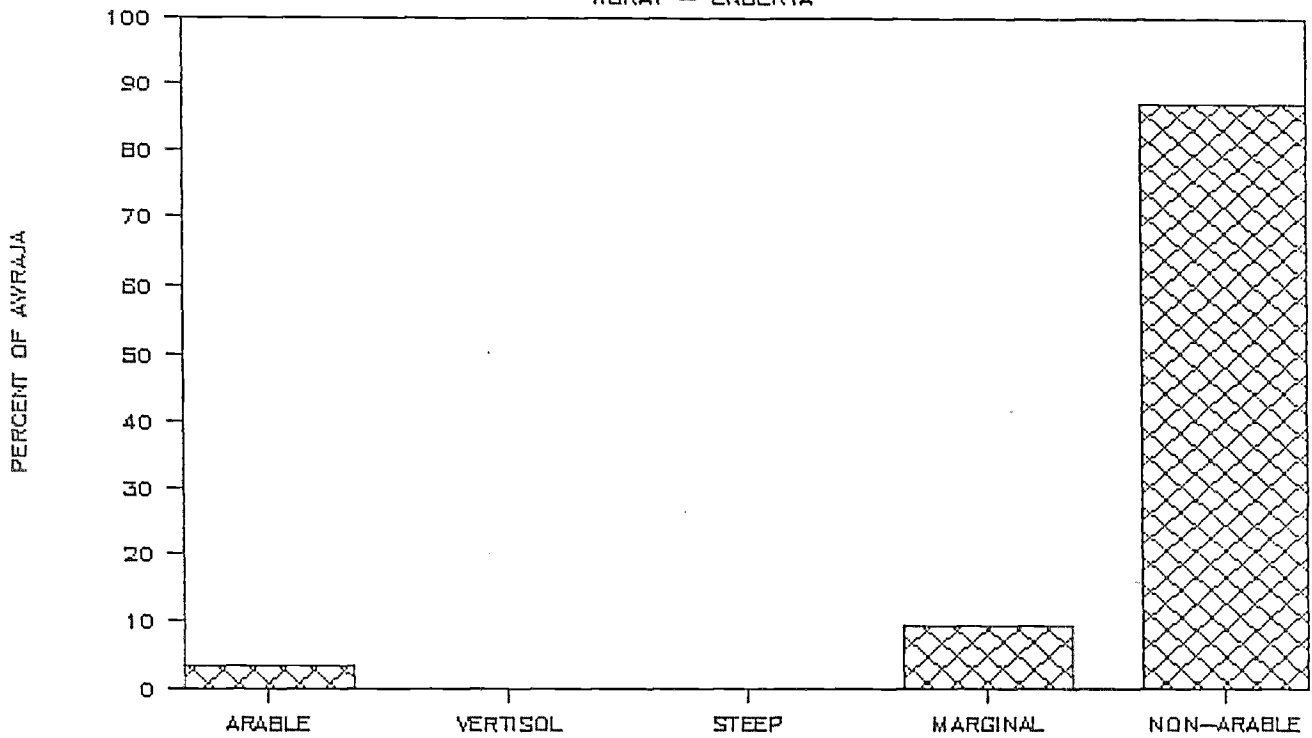
LAND MANAGEMENT CLASSES

TIGRAY - HULET AWLALO



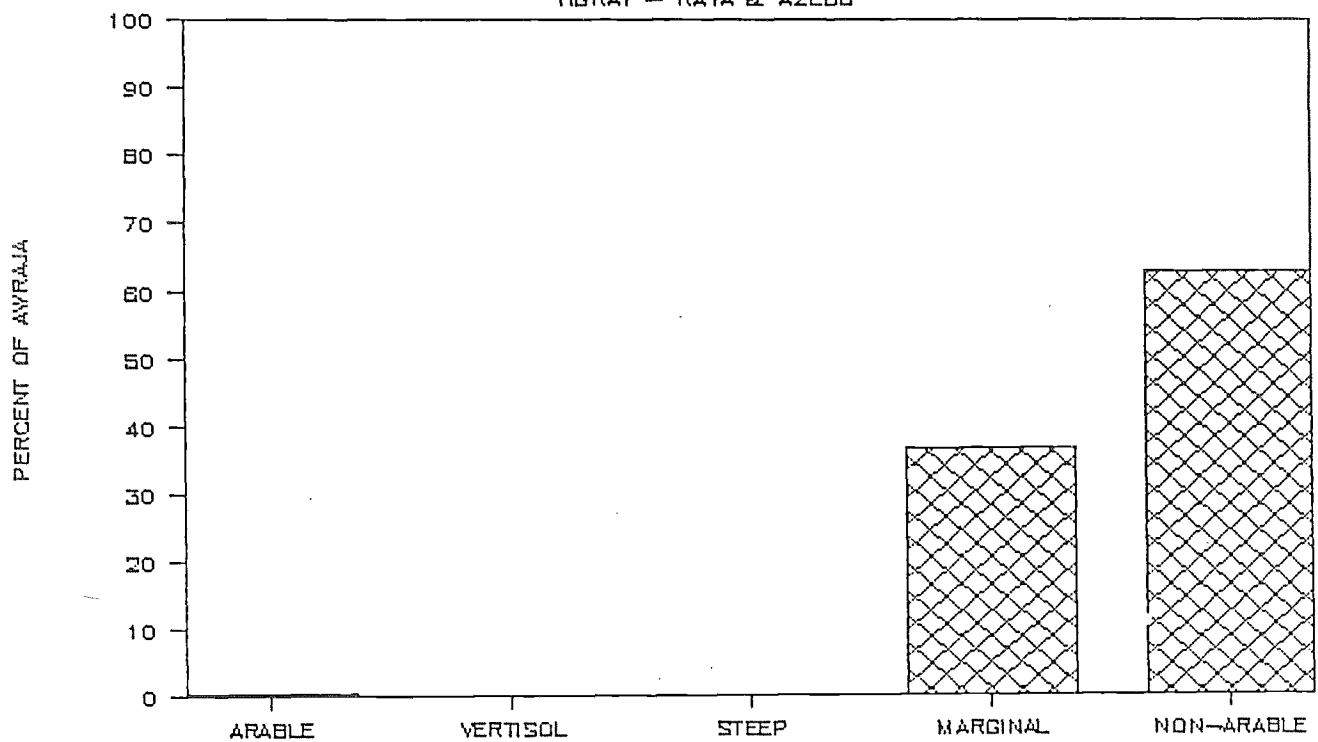
LAND MANAGEMENT CLASSES

TIGRAY — ENDERTA



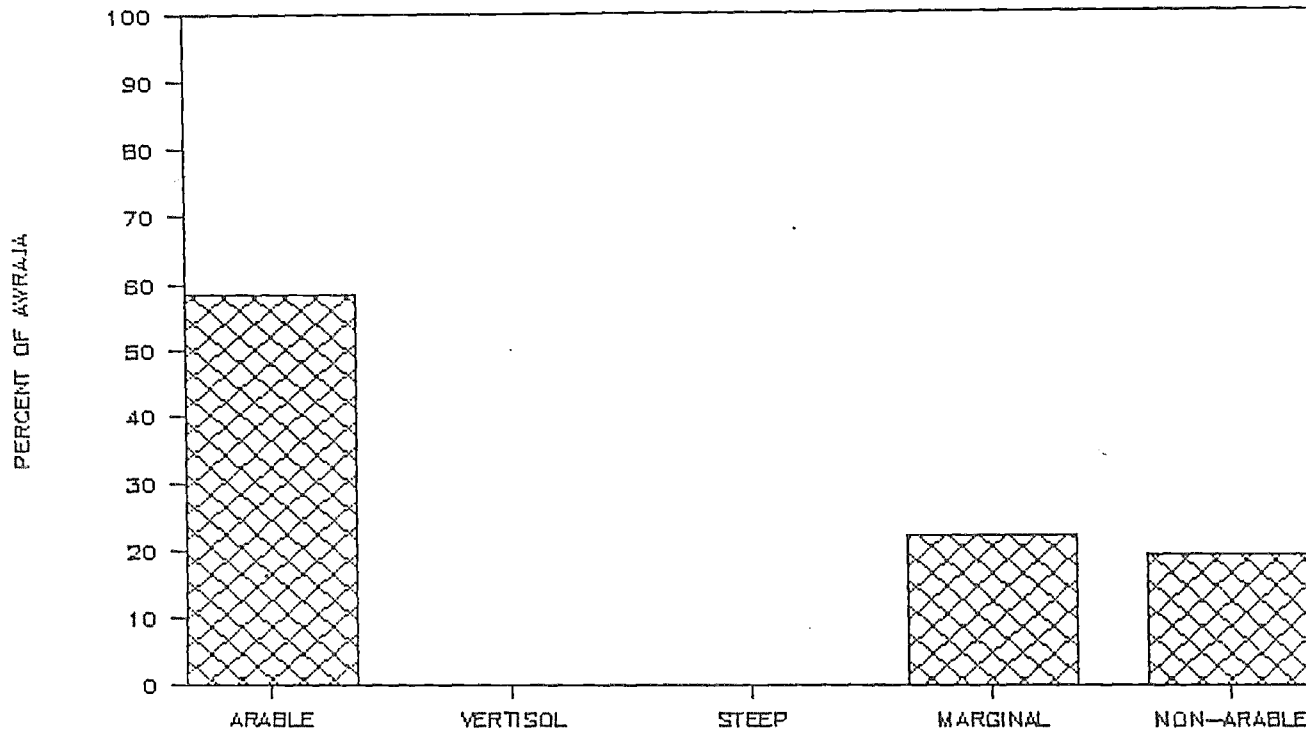
LAND MANAGEMENT CLASSES

TIGRAY — RAYA & AZEBO



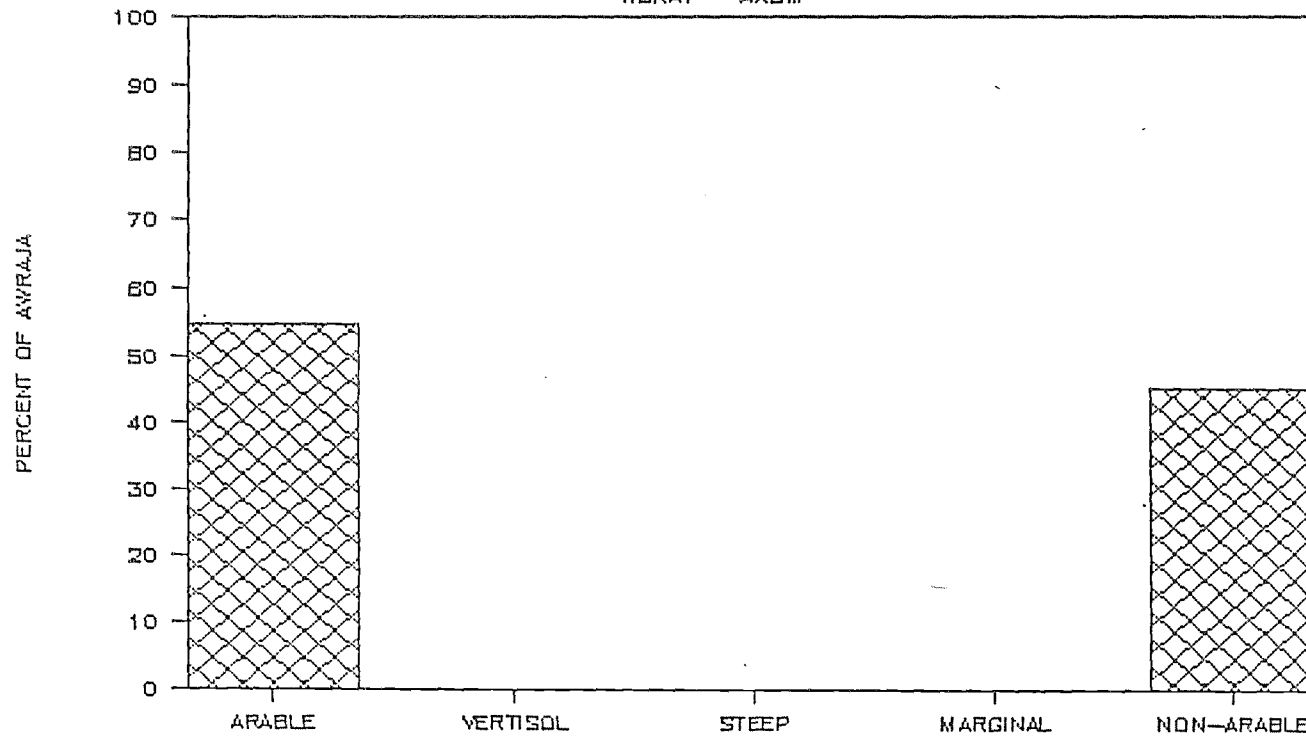
LAND MANAGEMENT CLASSES

TIGRAY - TEMBIEN



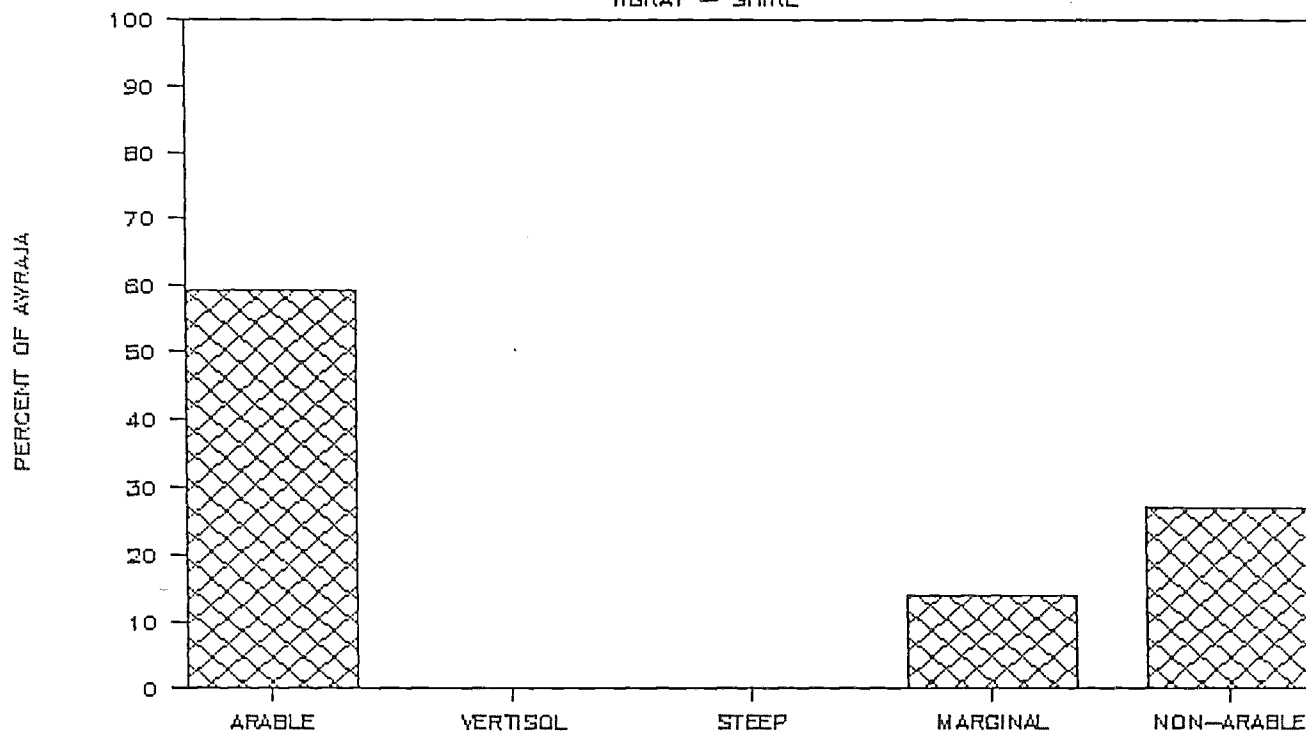
LAND MANAGEMENT CLASSES

TIGRAY - AXUM



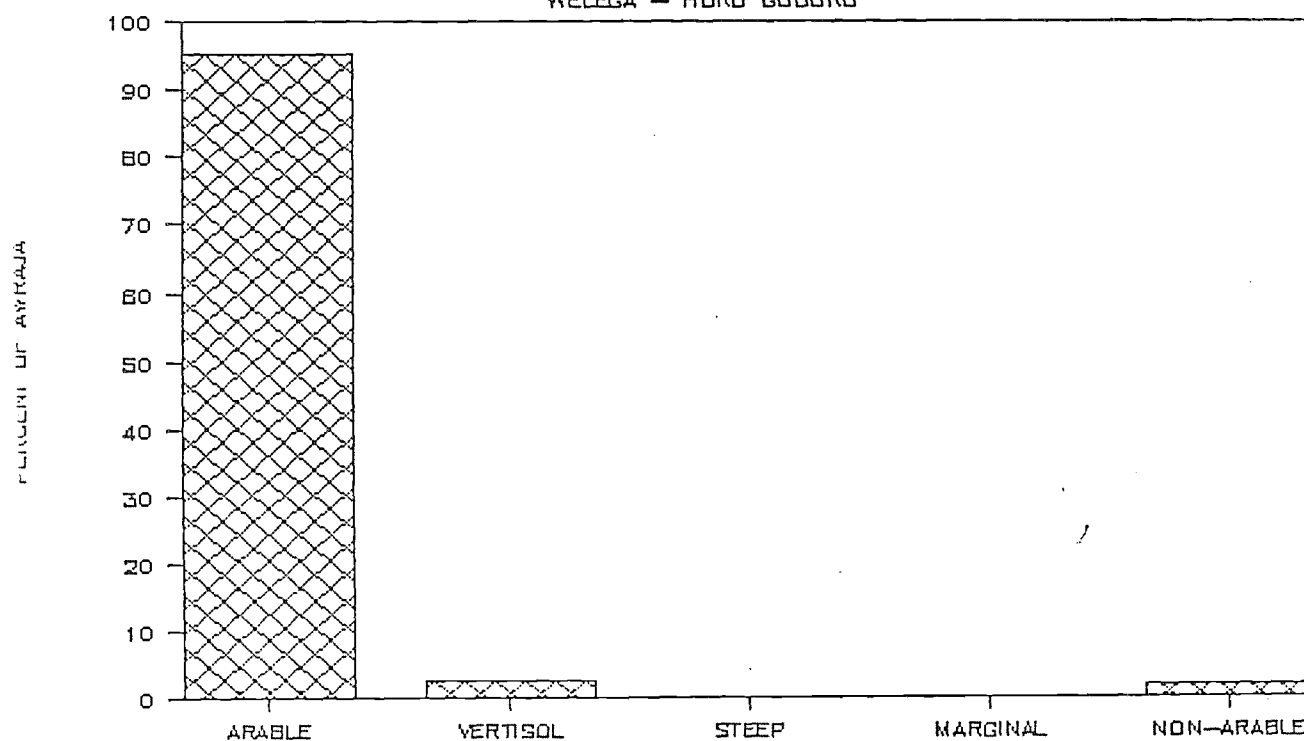
LAND MANAGEMENT CLASSES

TIGRAY - SHIRE



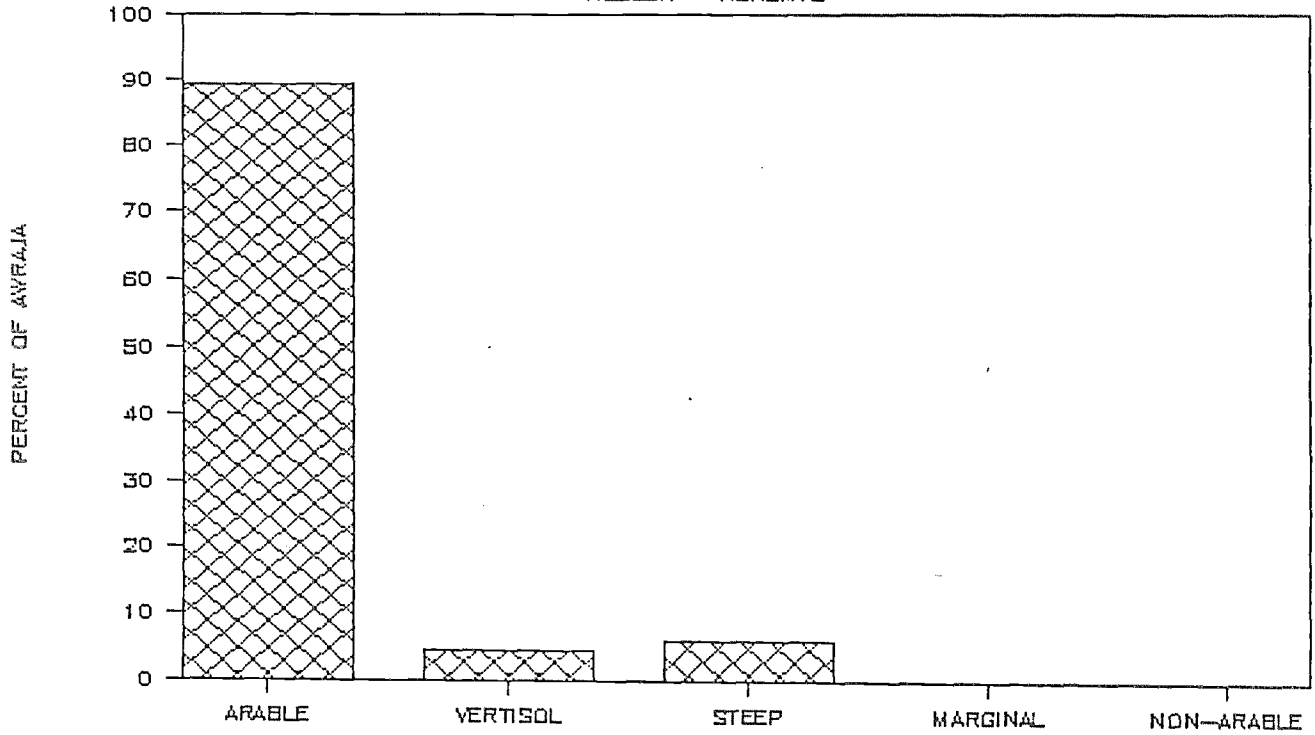
LAND MANAGEMENT CLASSES

WELEGA - HORO GUDURU



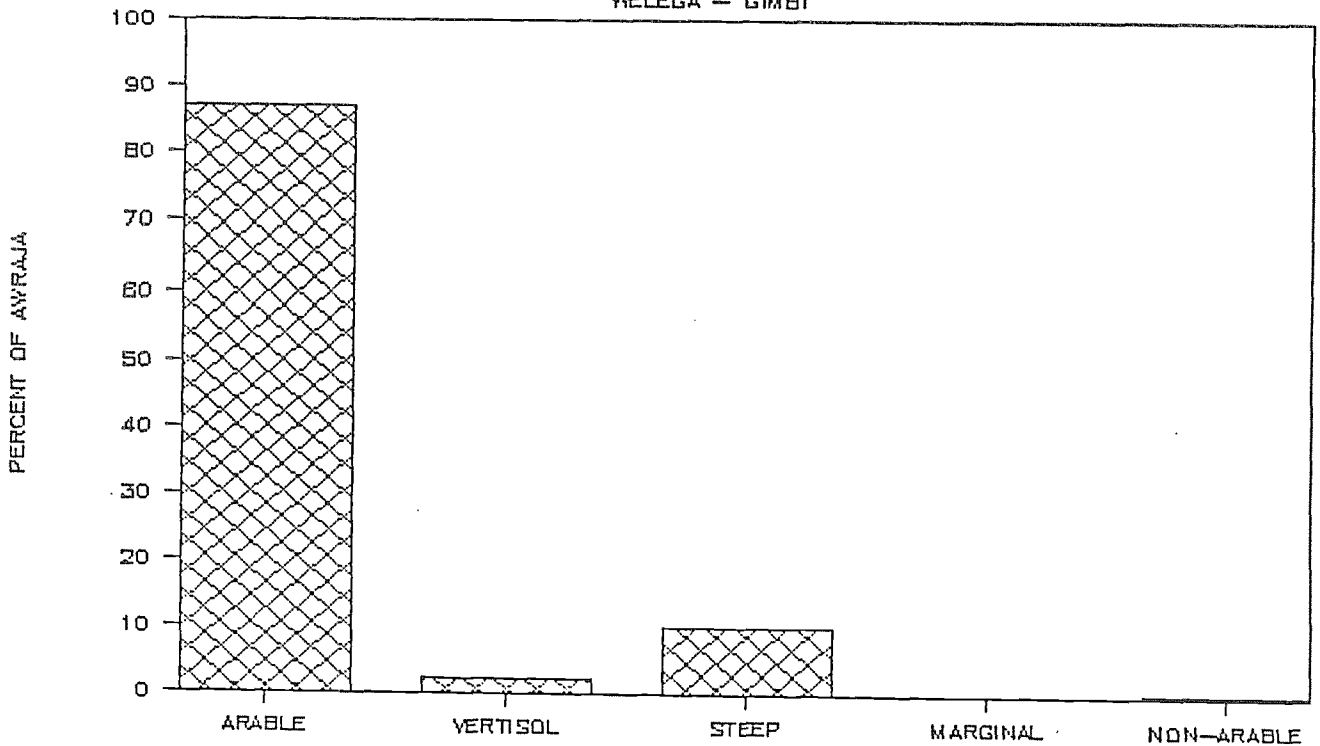
LAND MANAGEMENT CLASSES

WELEGA - NEKENTE



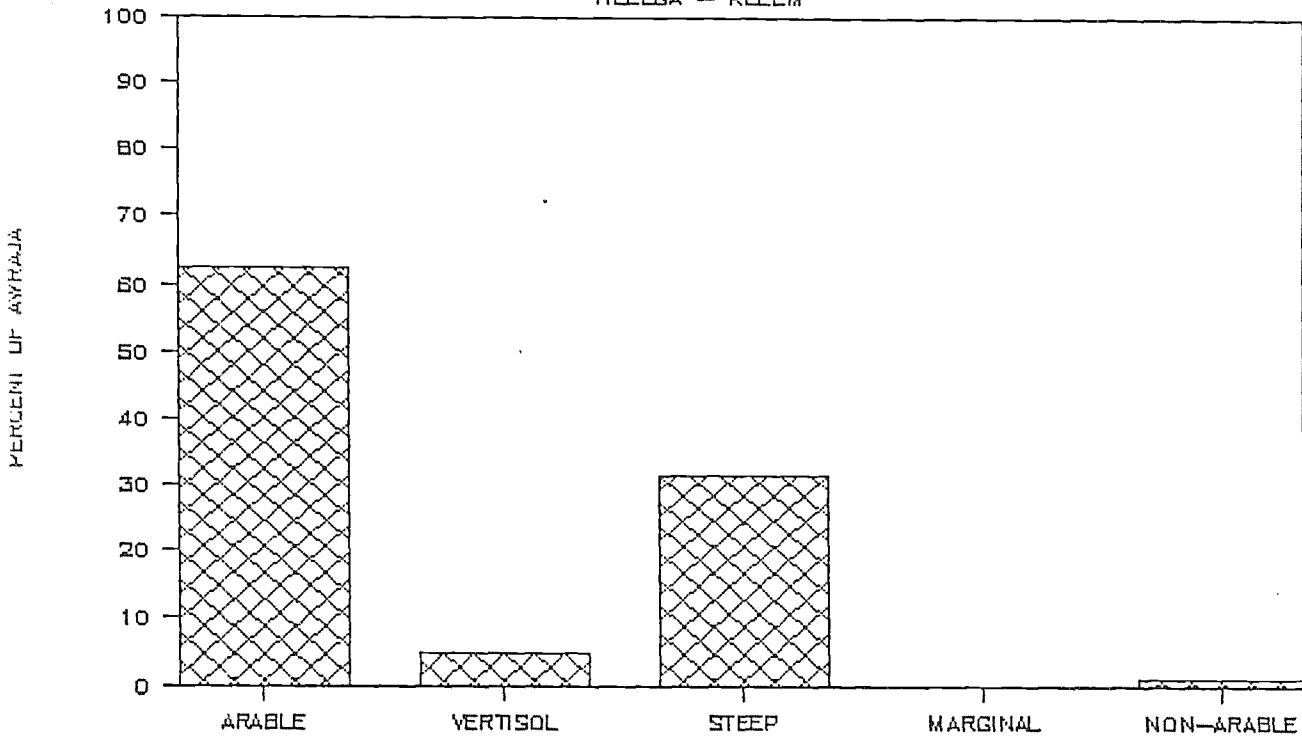
LAND MANAGEMENT CLASSES

WELEGA - GIMBI



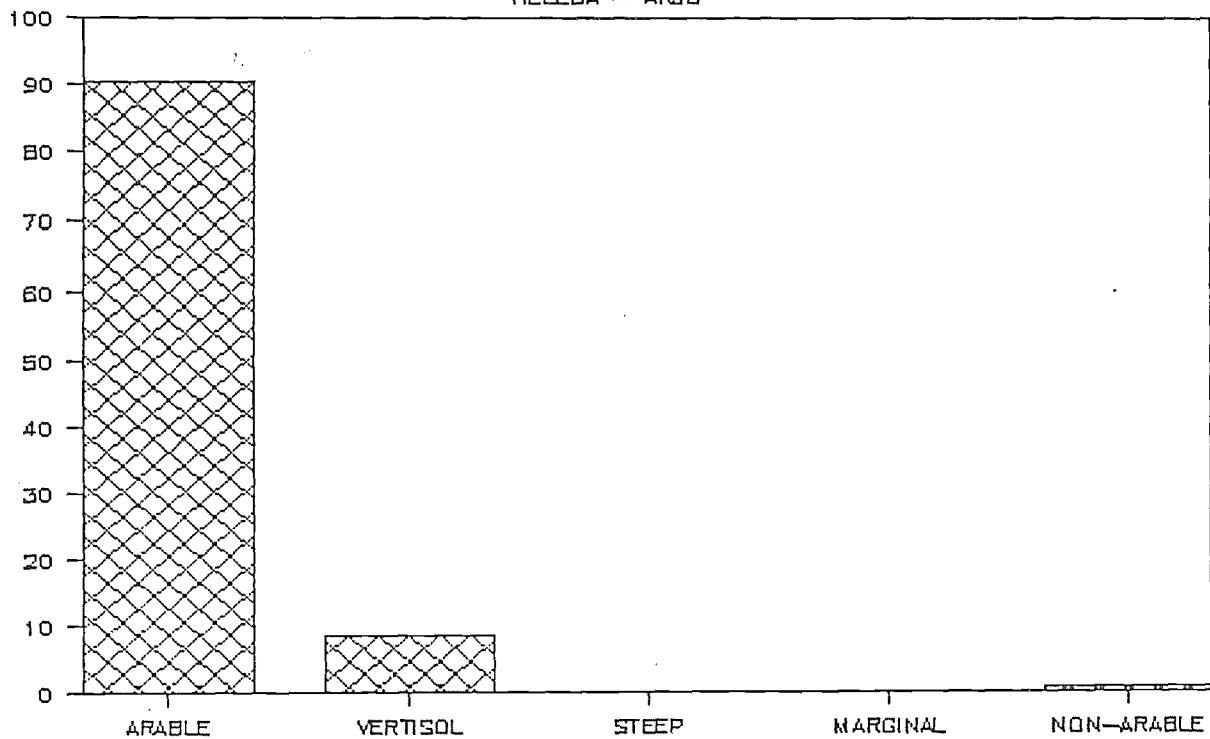
LAND MANAGEMENT CLASSES

WELEGA - KELEM



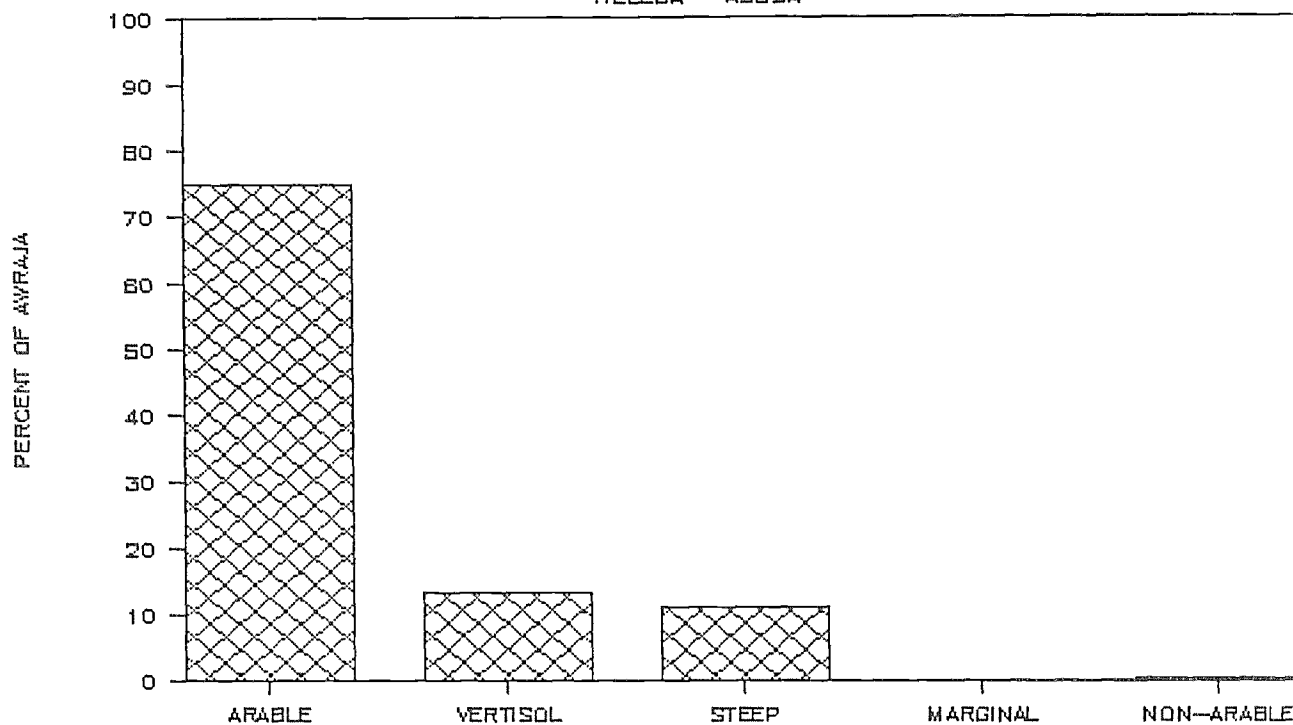
LAND MANAGEMENT CLASSES

WELEGA - ARJO



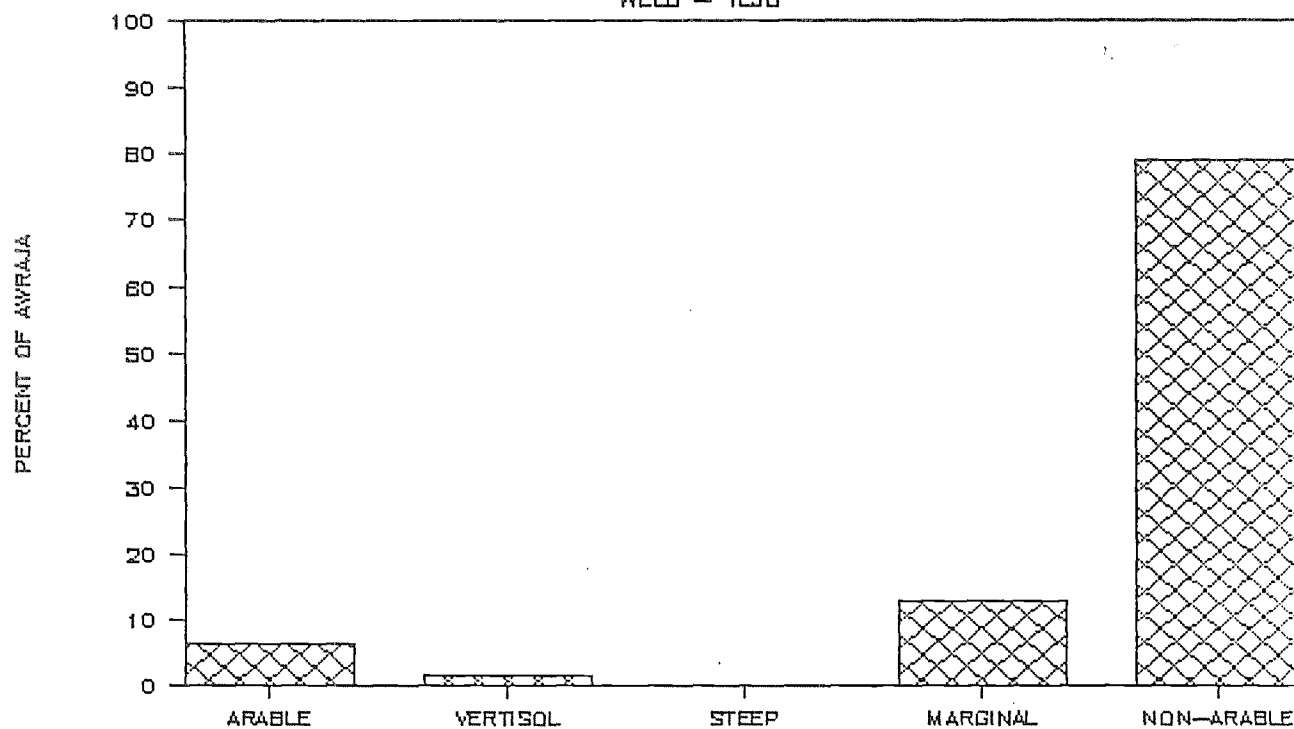
LAND MANAGEMENT CLASSES

WELEGA - ASOSA



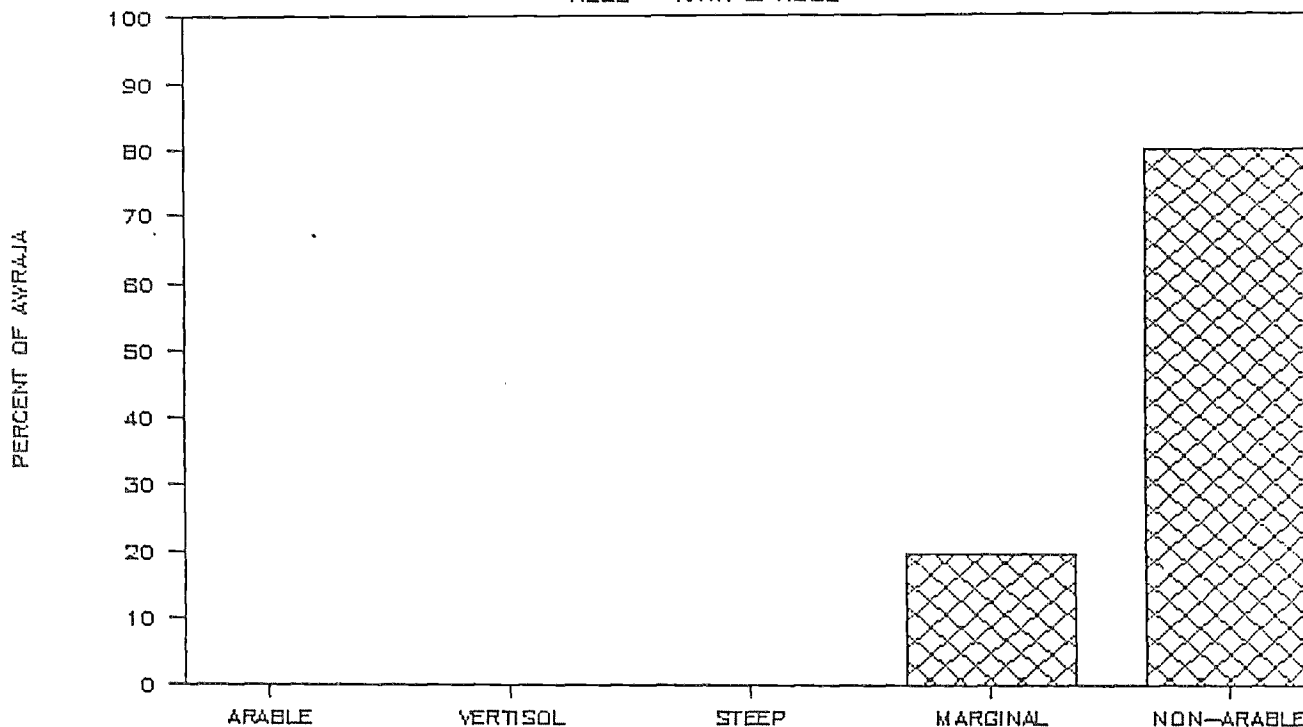
LAND MANAGEMENT CLASSES

WELD - YEJU



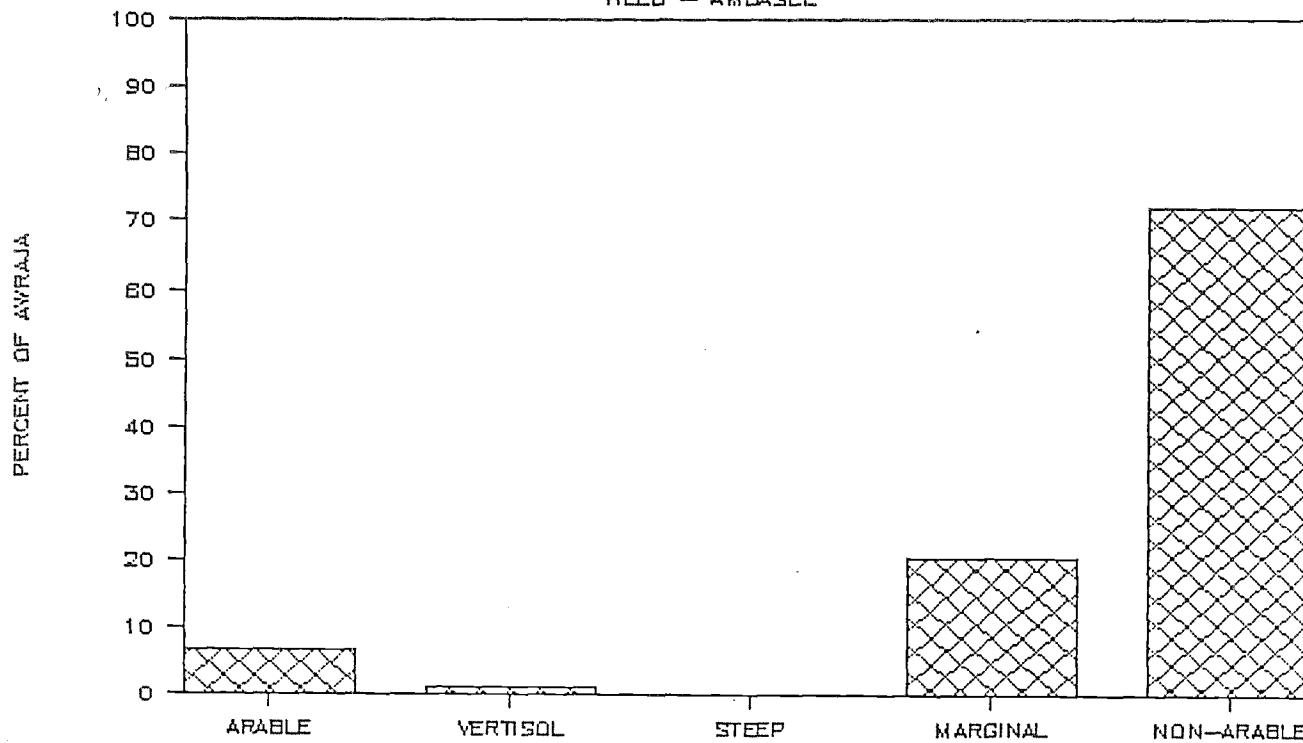
LAND MANAGEMENT CLASSES

WELD - RAYA & KOBQ



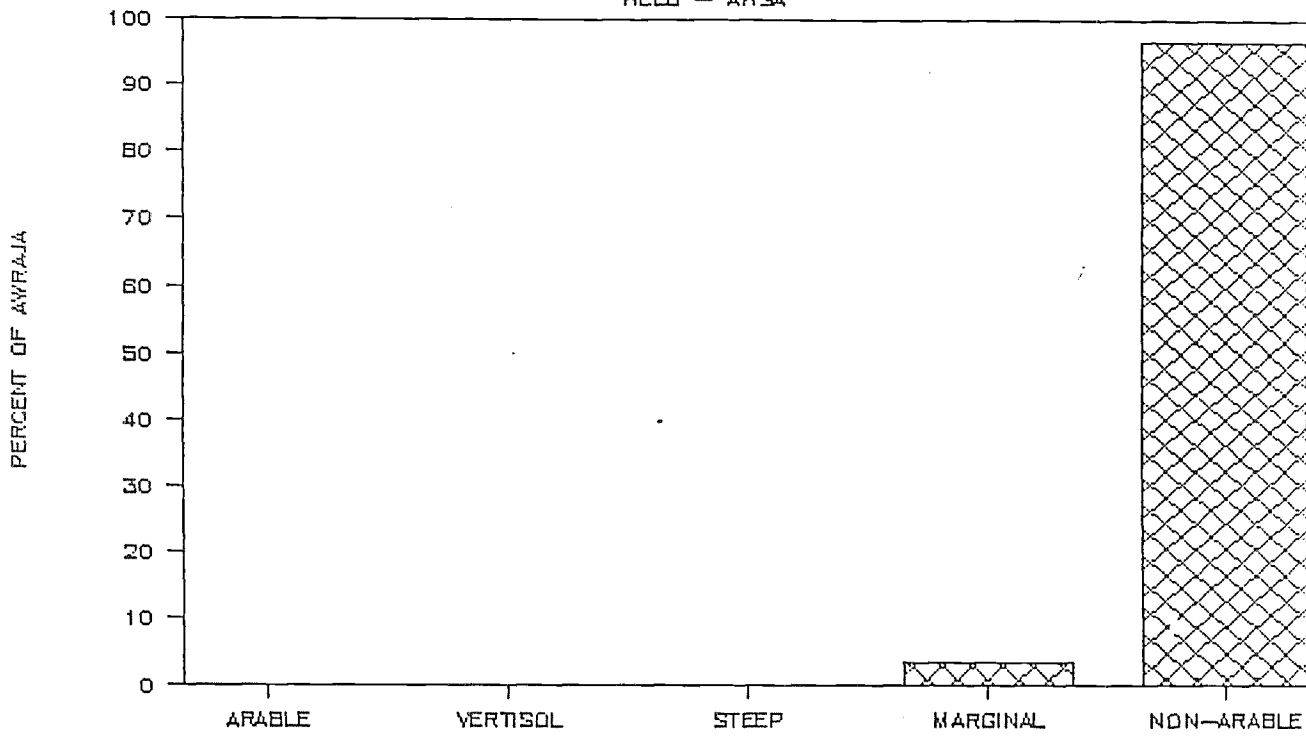
LAND MANAGEMENT CLASSES

WELD - AMBASEL



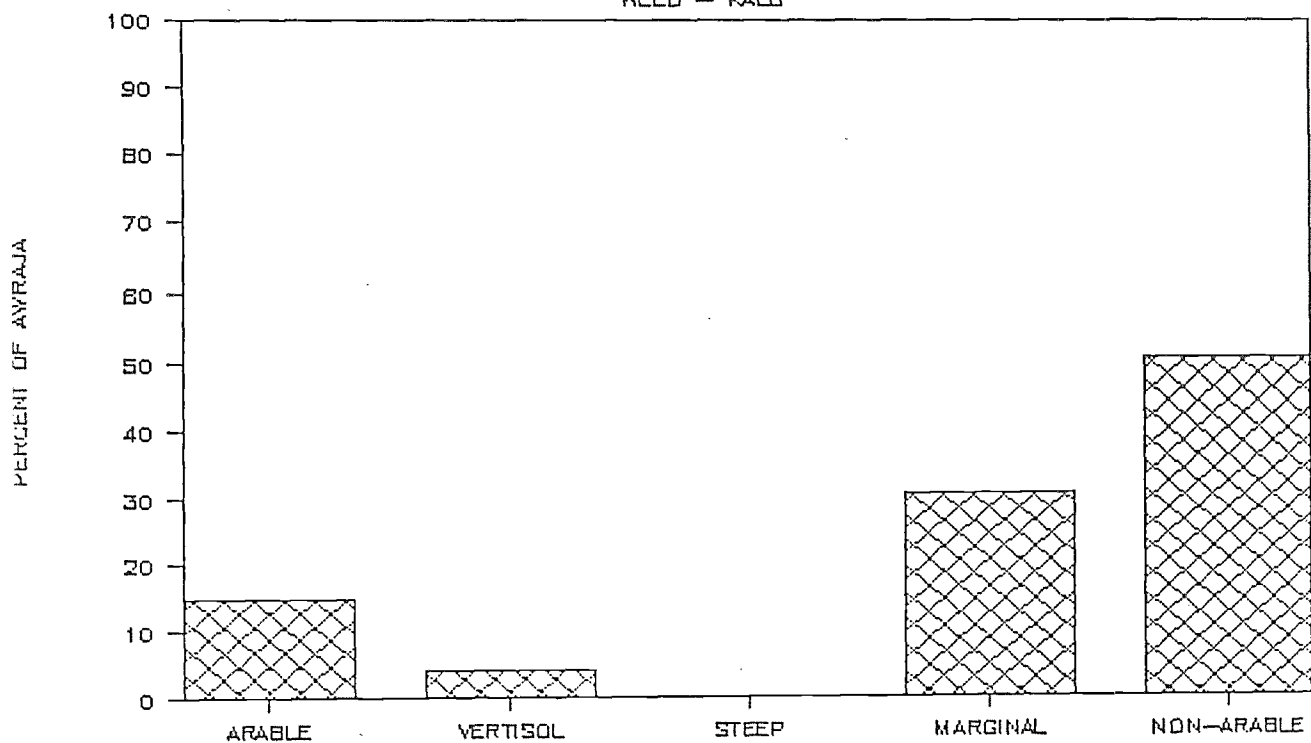
LAND MANAGEMENT CLASSES

WELD - AWSA



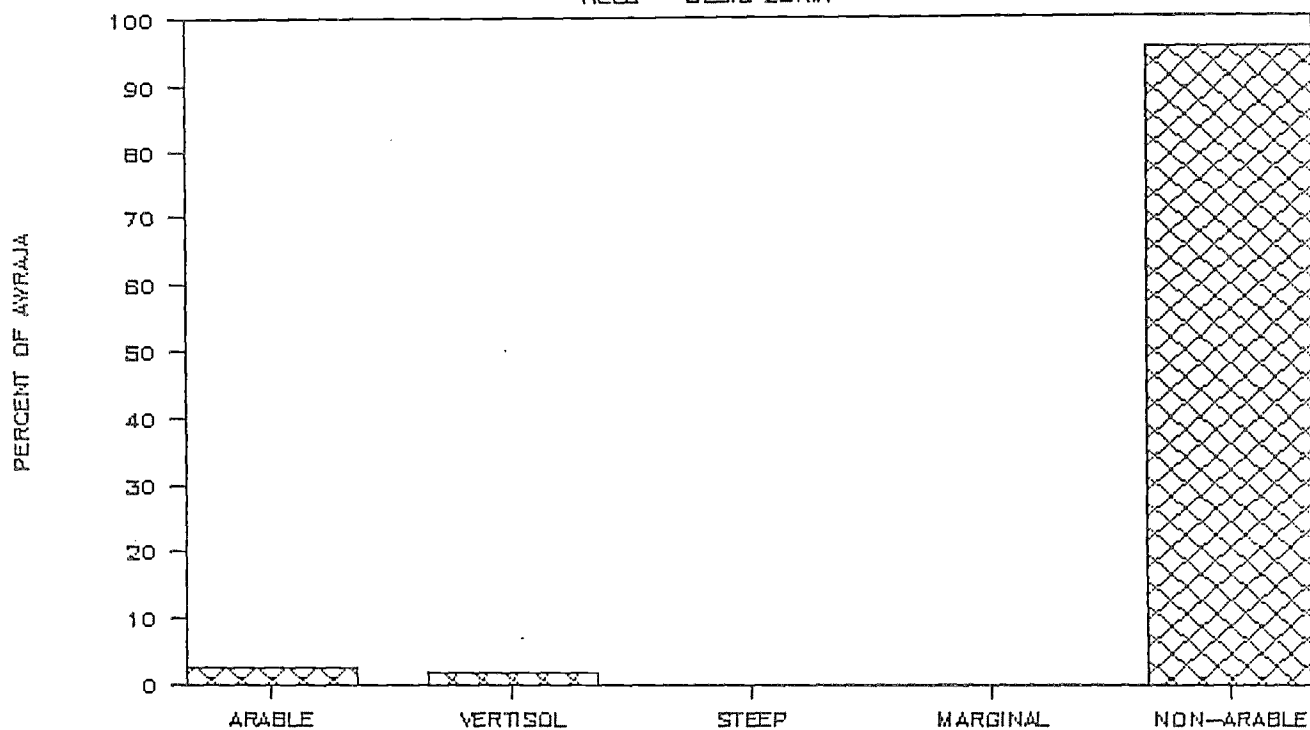
LAND MANAGEMENT CLASSES

WELD - KALLI



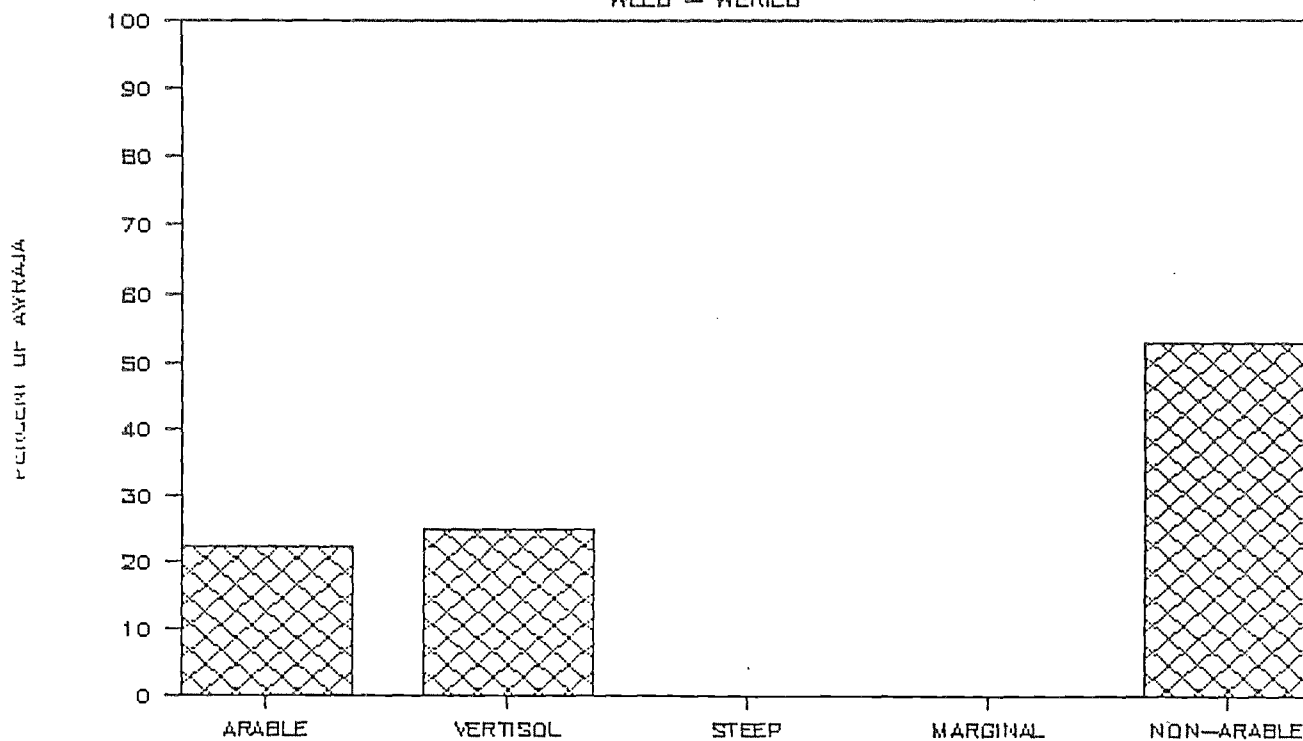
LAND MANAGEMENT CLASSES

WELD - DESIE ZURIA



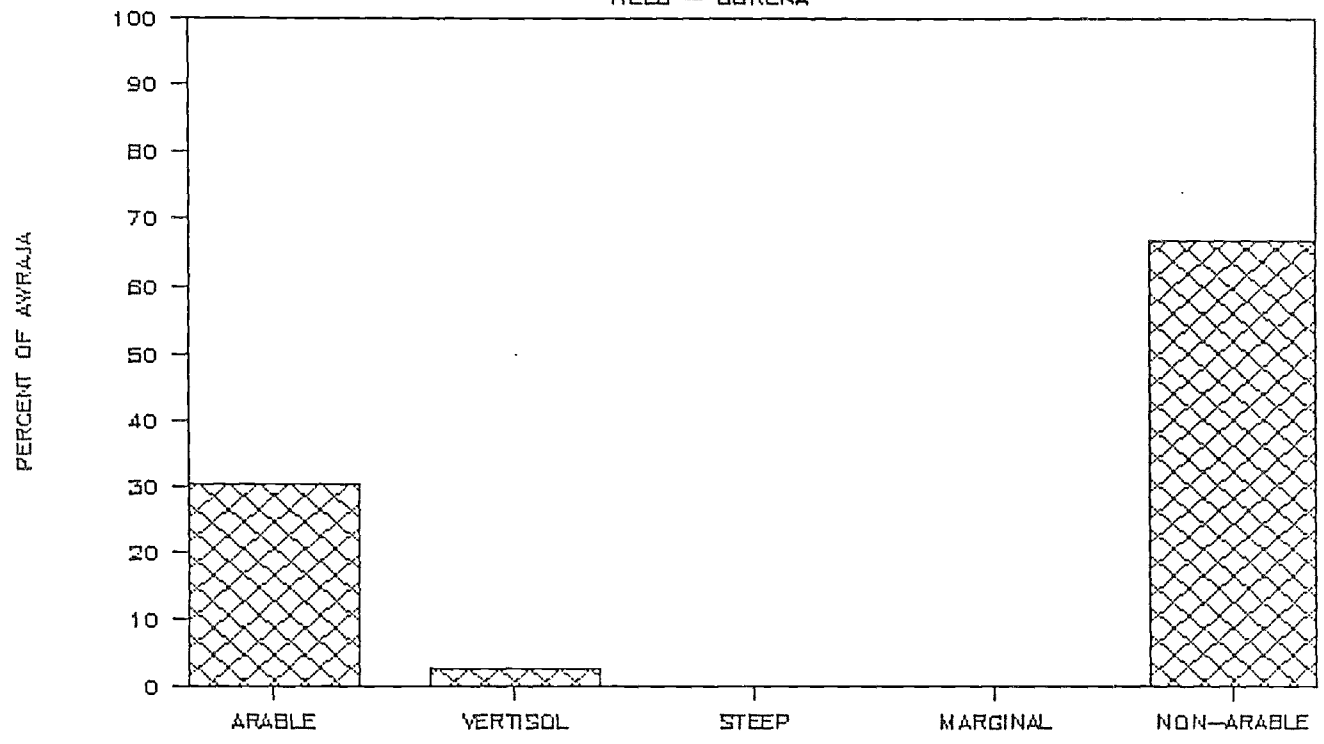
LAND MANAGEMENT CLASSES

WELD - WERILLI



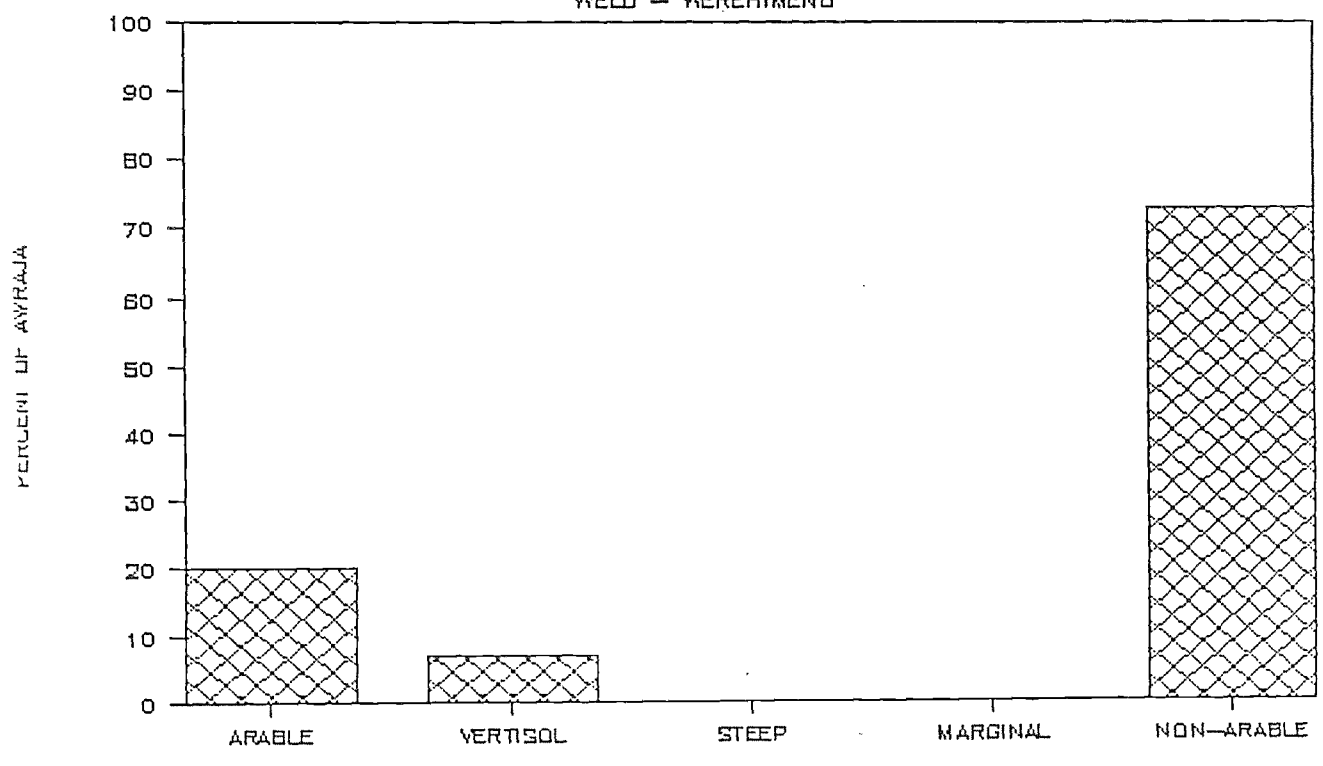
LAND MANAGEMENT CLASSES

WELD - BORENA



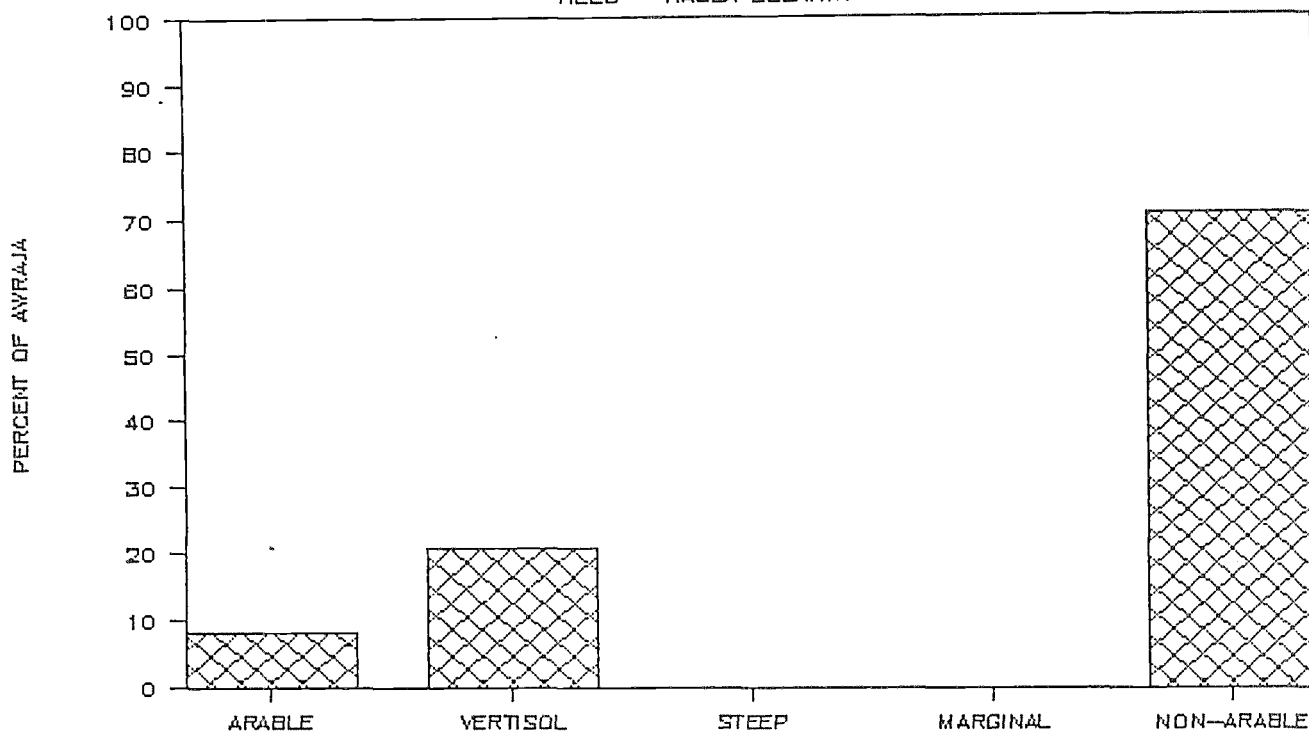
LAND MANAGEMENT CLASSES

WELD - WEREHIMEND



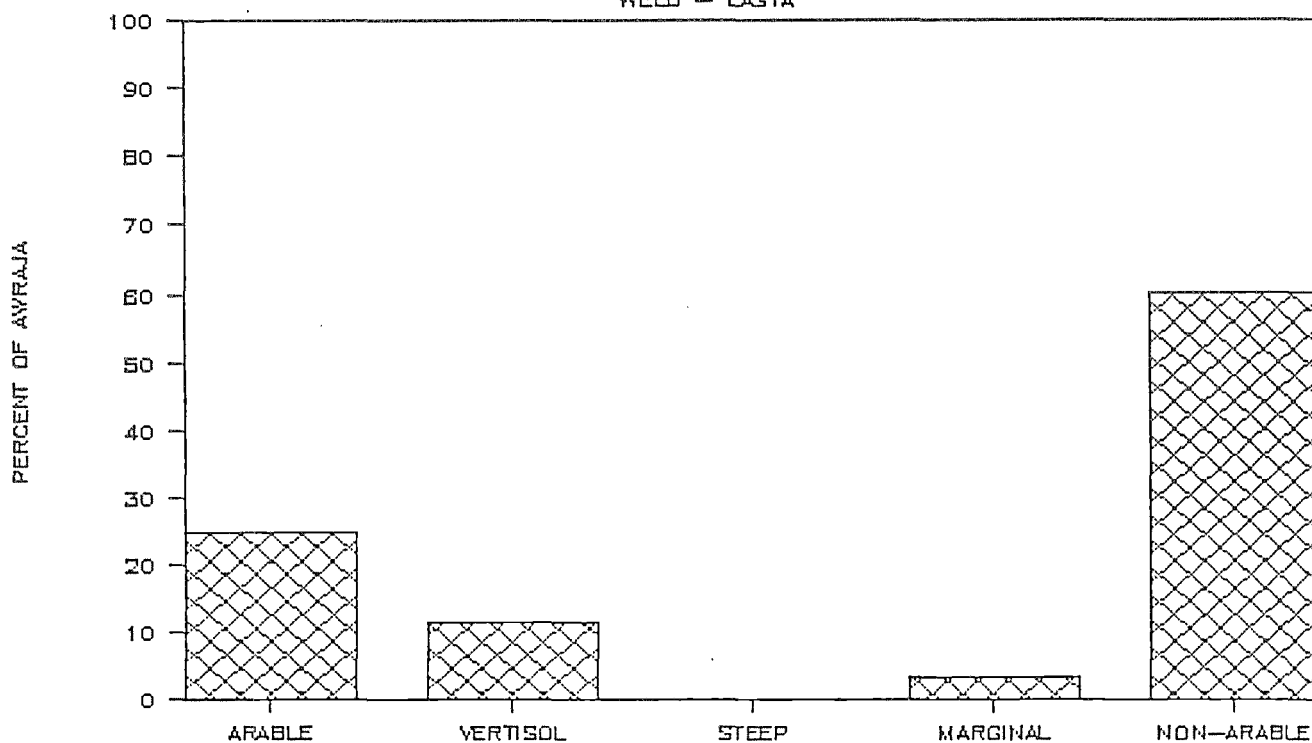
LAND MANAGEMENT CLASSES

WELO - WADLA DELANTA



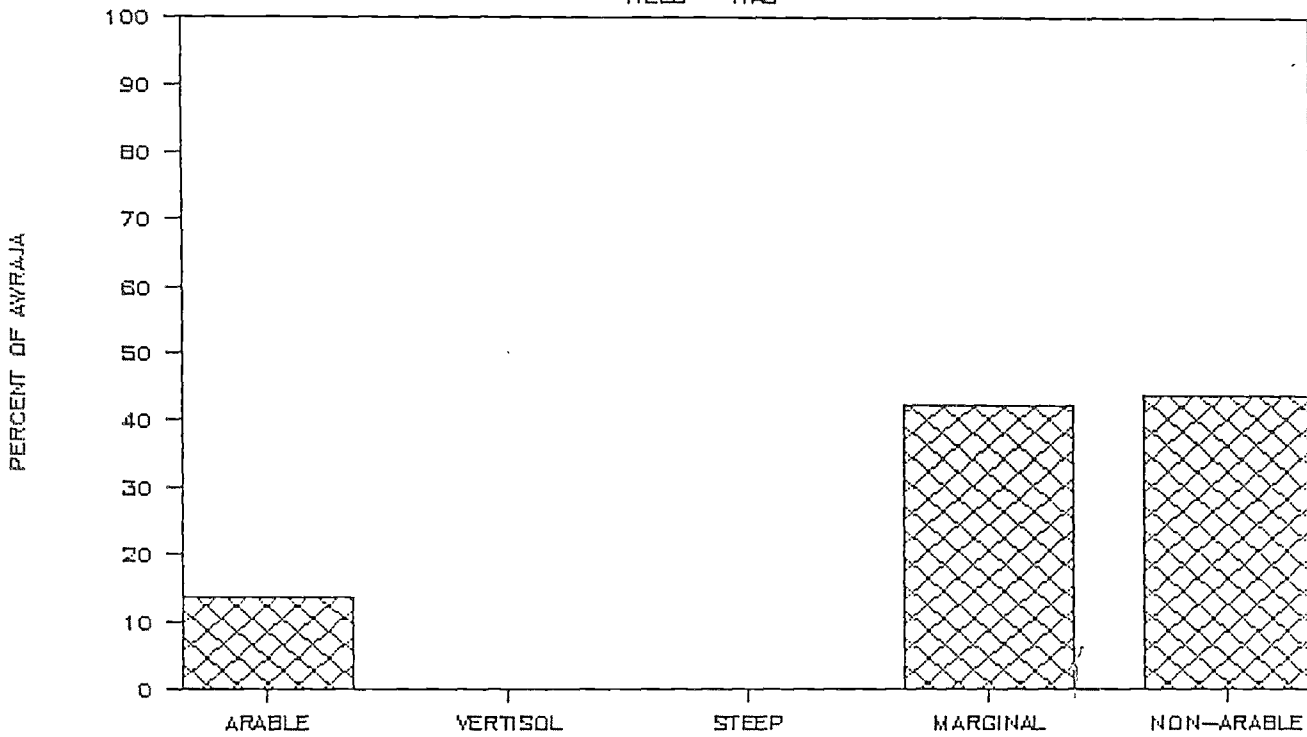
LAND MANAGEMENT CLASSES

WELO - LASTA



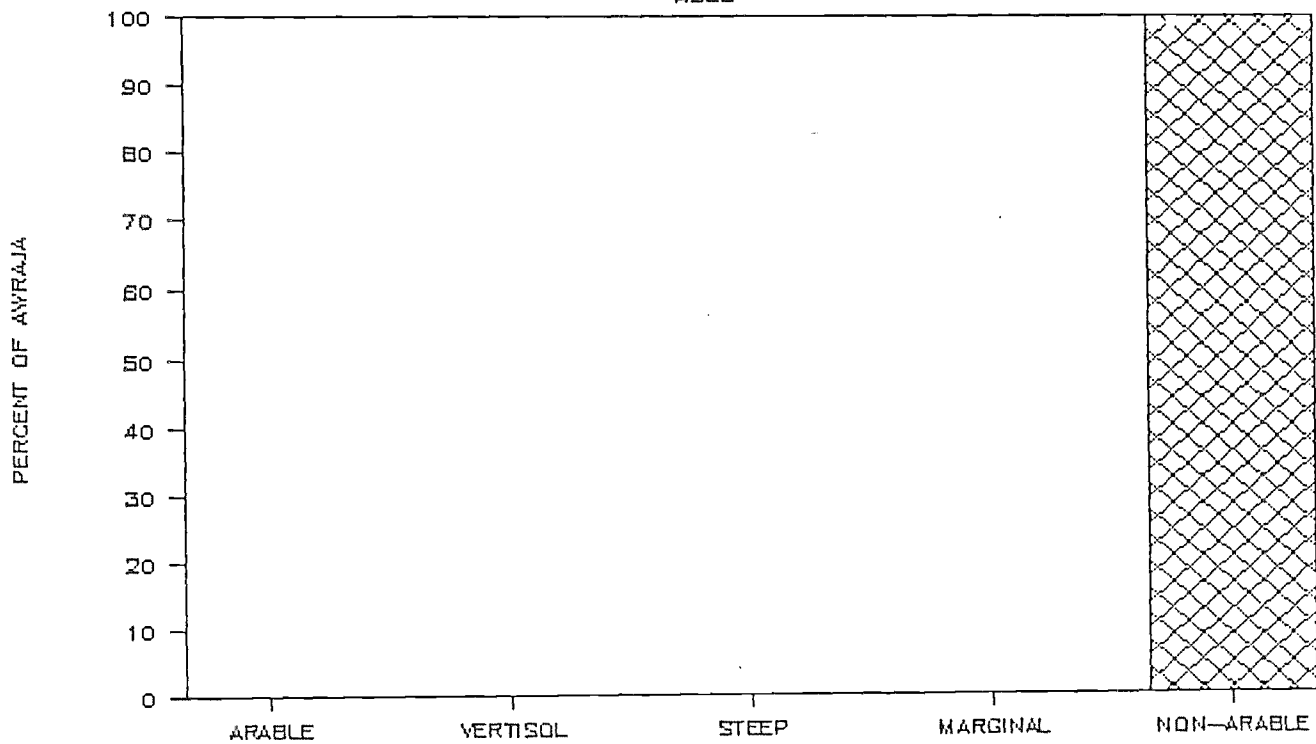
LAND MANAGEMENT CLASSES

WELD - WAG



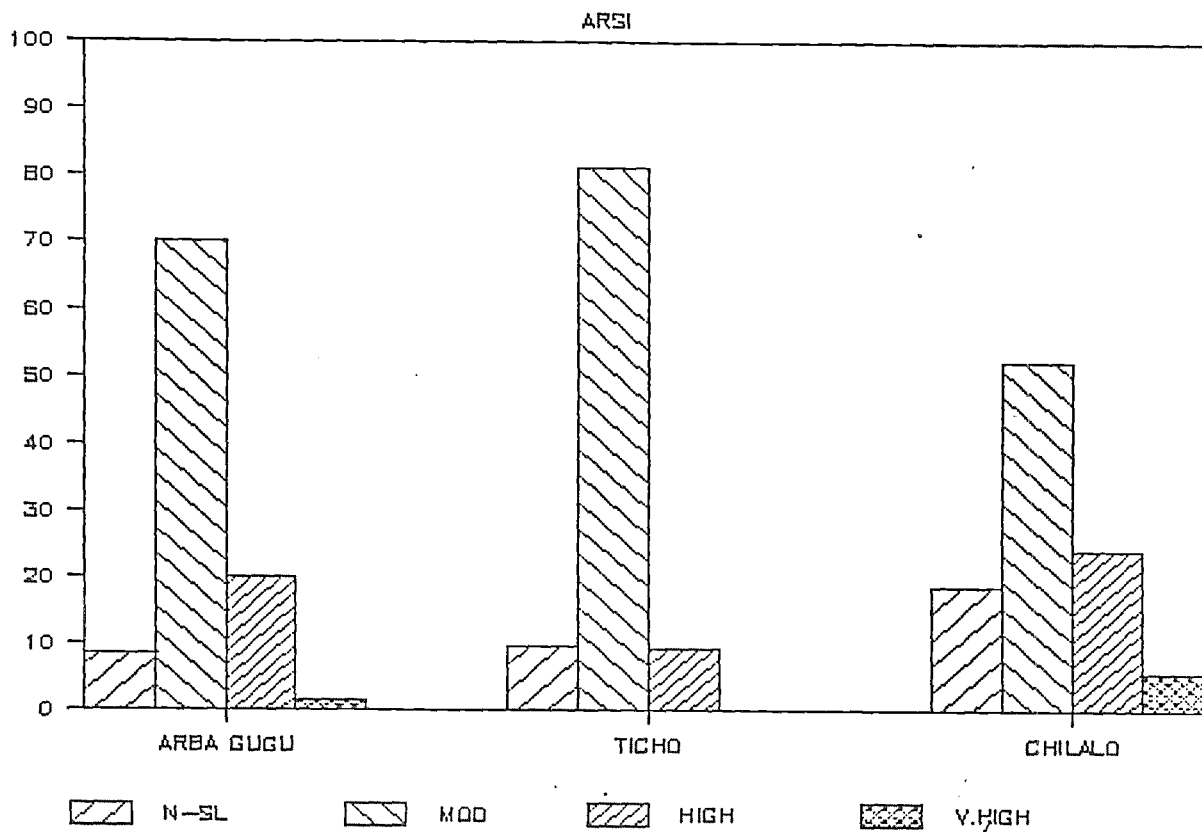
LAND MANAGEMENT CLASSES

ASEB

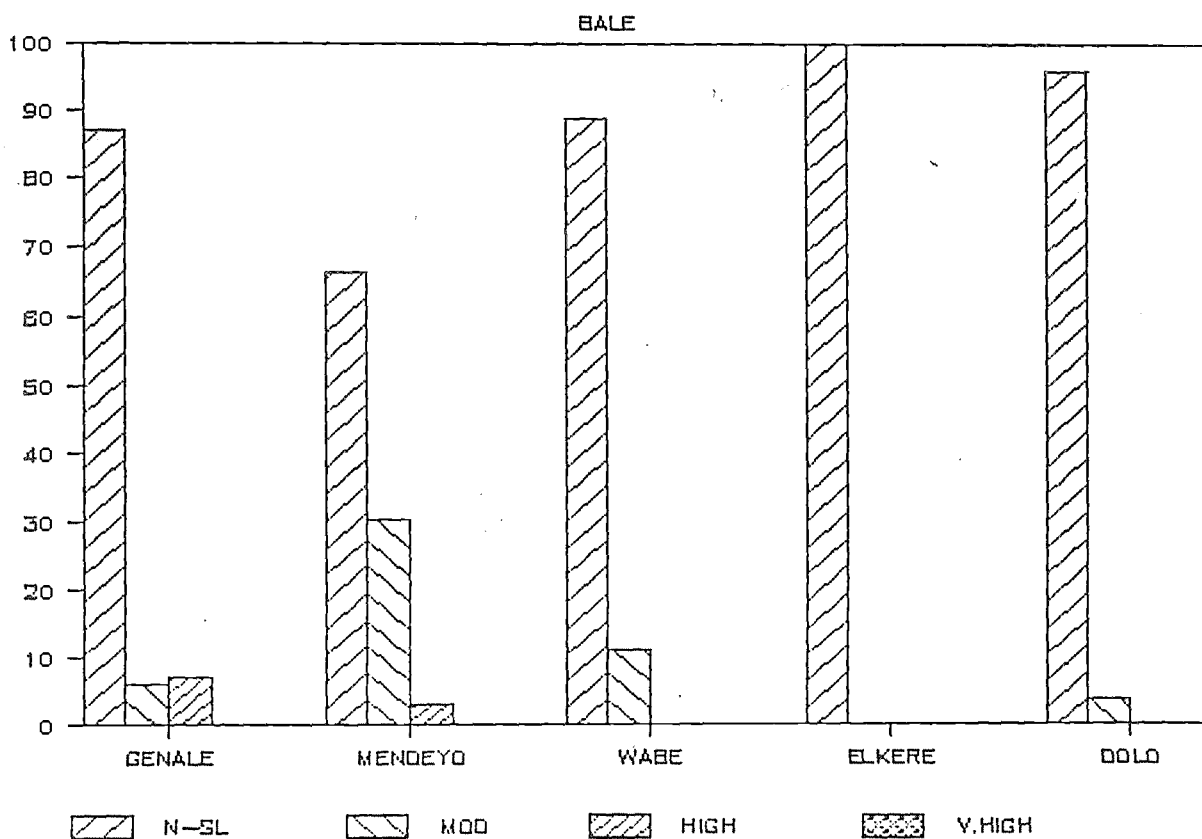


ESTIMATED SOIL LOSS RATE

ESTIMATED SOIL LOSS RATE

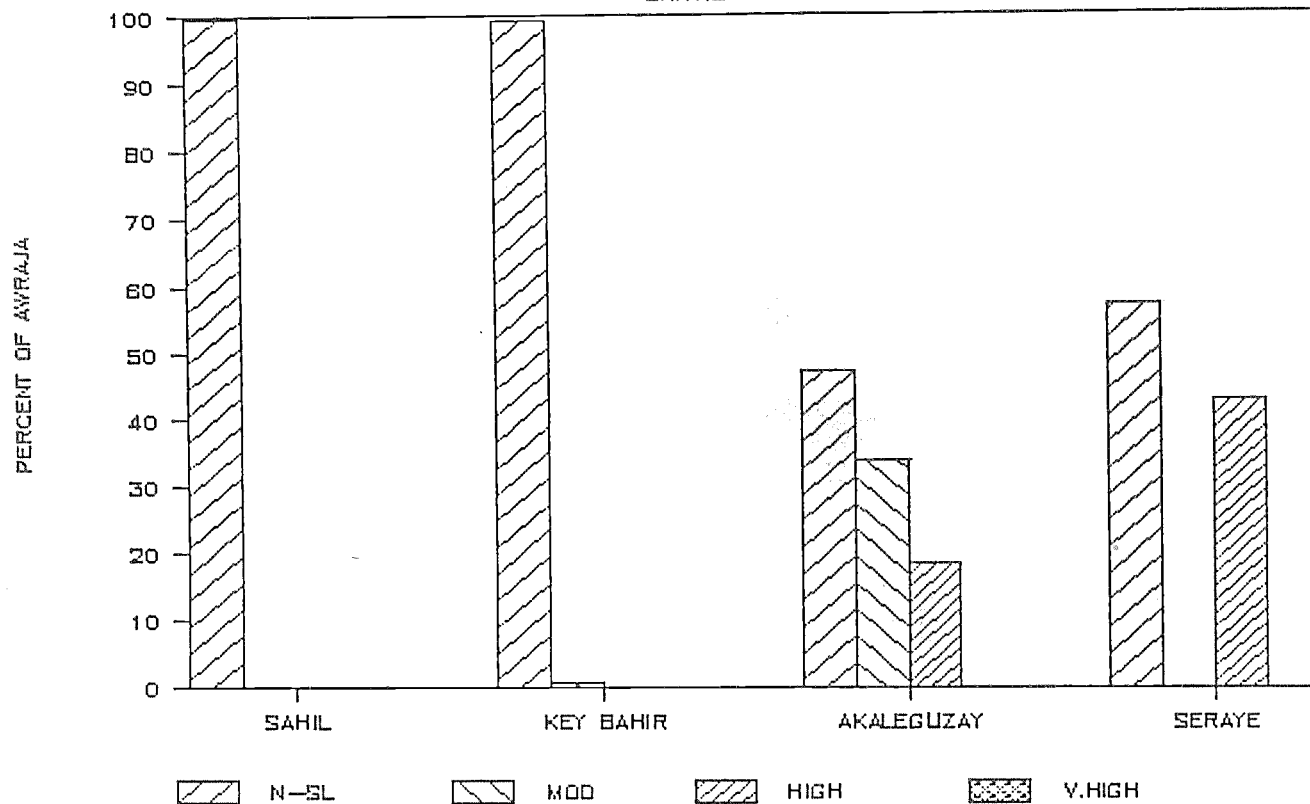


ESTIMATED SOIL LOSS RATE



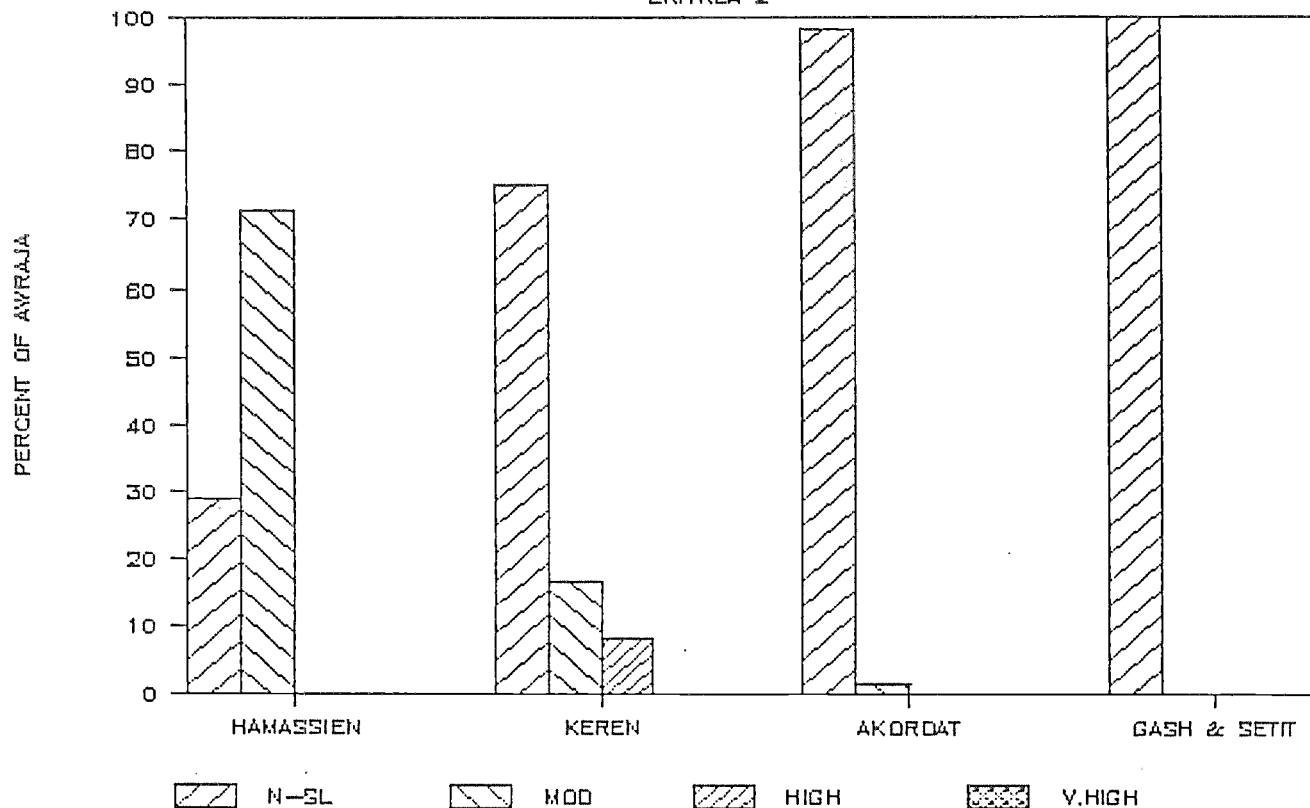
ESTIMATED SOIL LOSS RATE

ERITREA 1



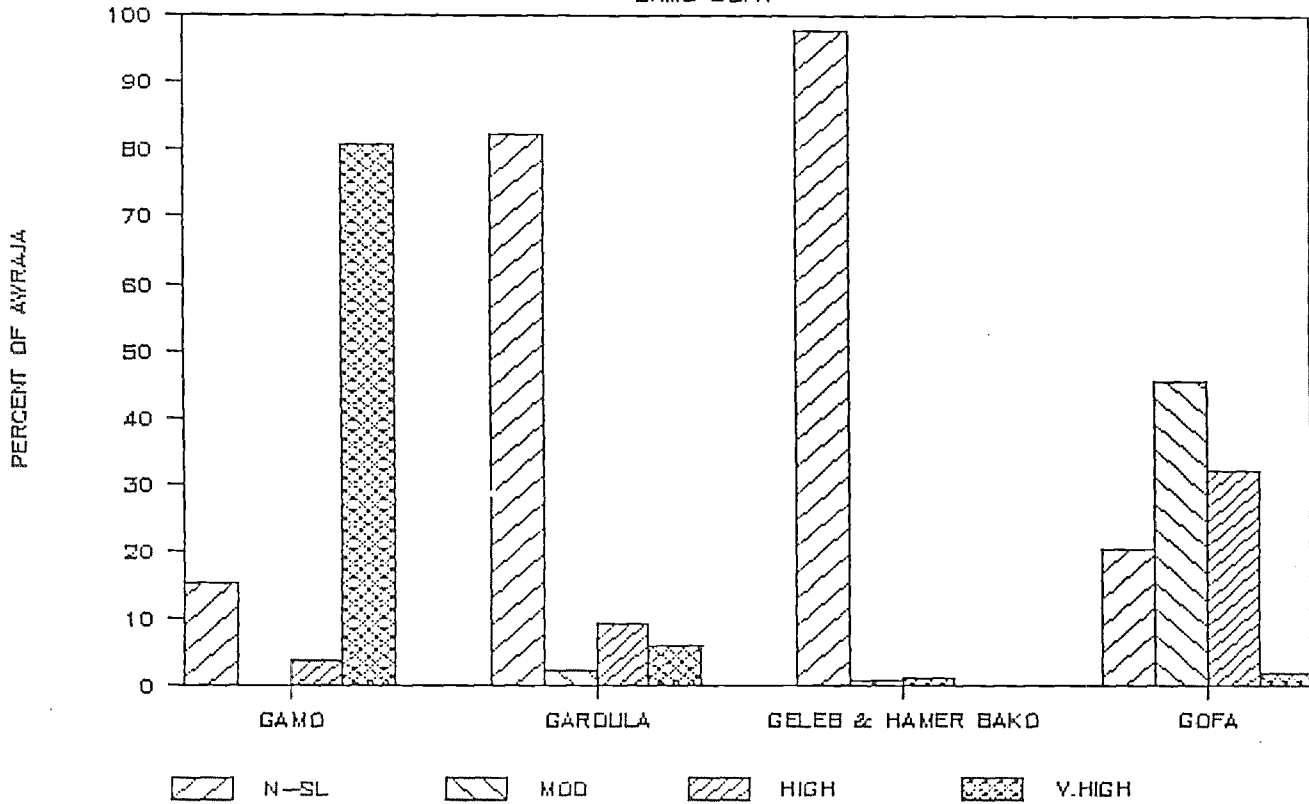
ESTIMATED SOIL LOSS RATE

ERITREA 2



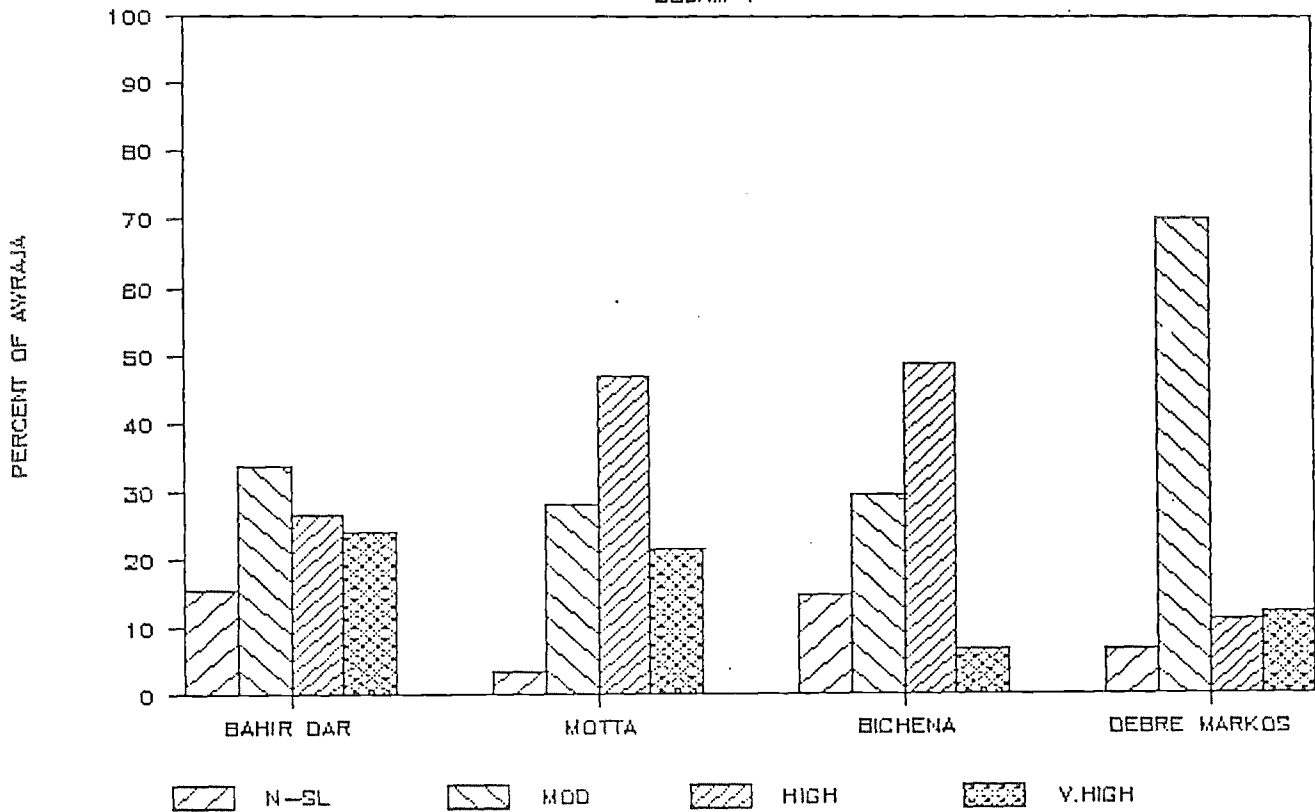
ESTIMATED SOIL LOSS RATE

GAMD GOFA



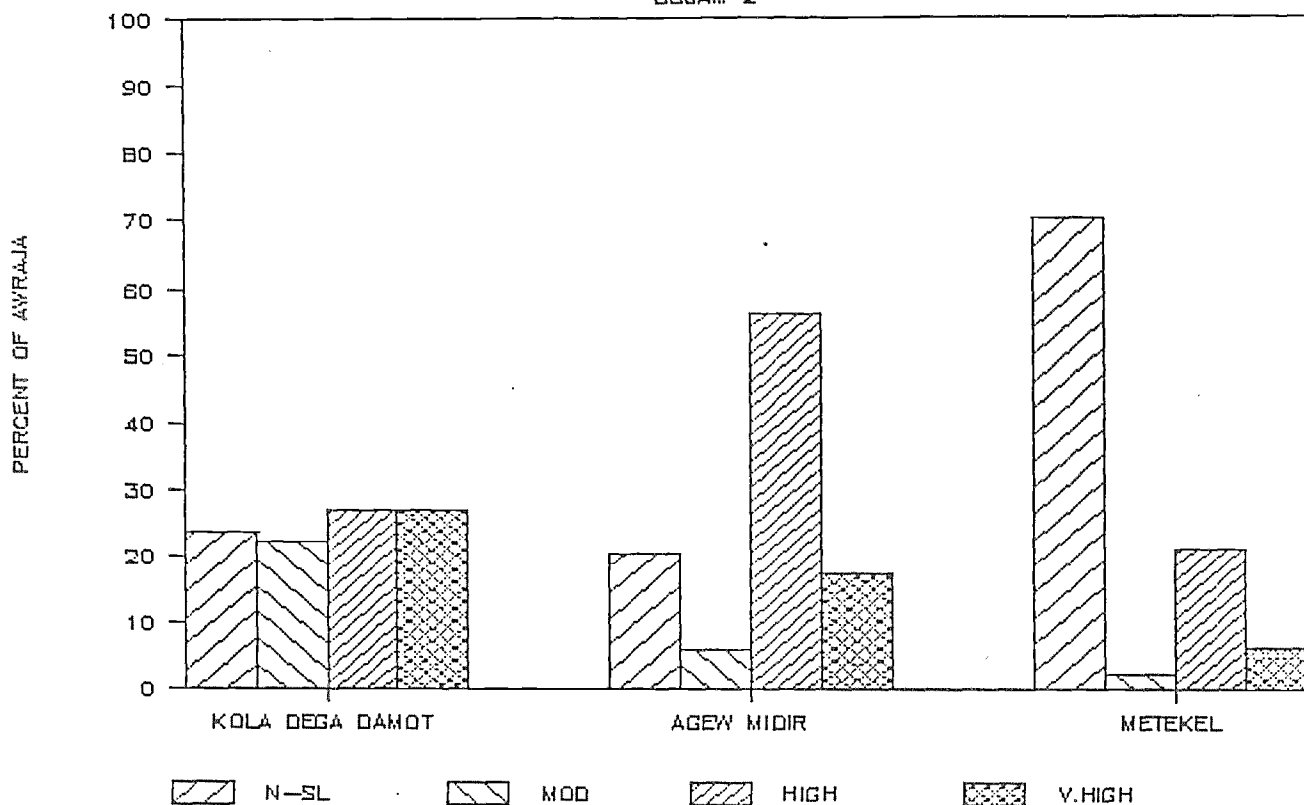
ESTIMATED SOIL LOSS RATE

GOJAM 1



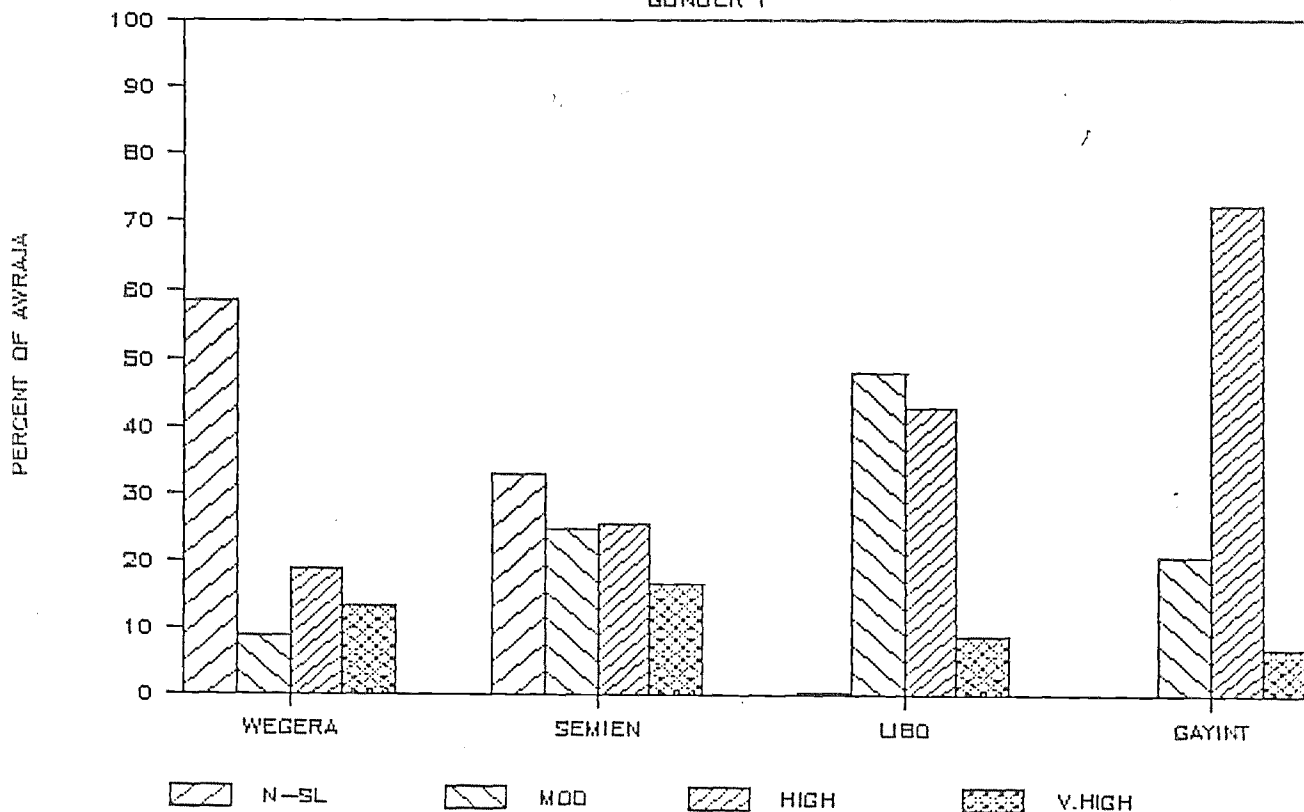
ESTIMATED SOIL LOSS RATE

GOJAH 2



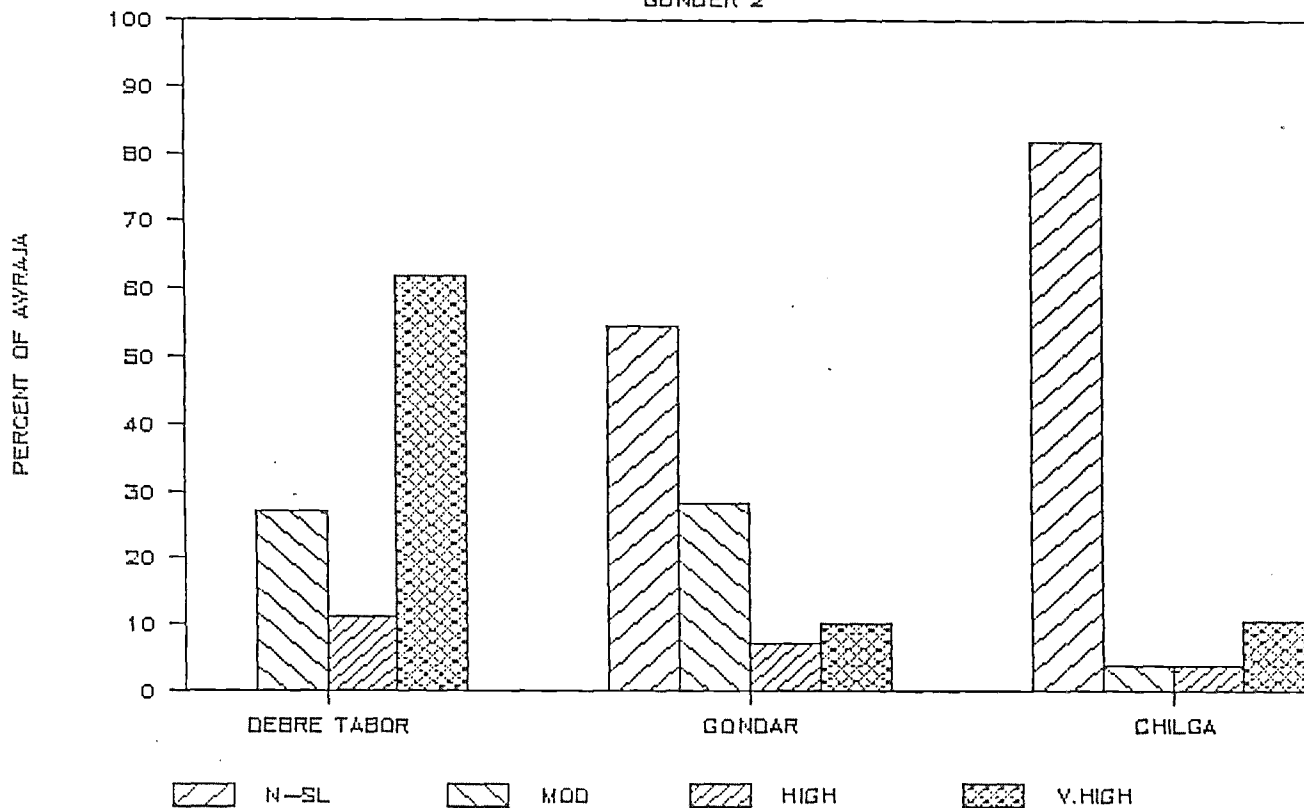
ESTIMATED SOIL LOSS RATE

GONDER 1



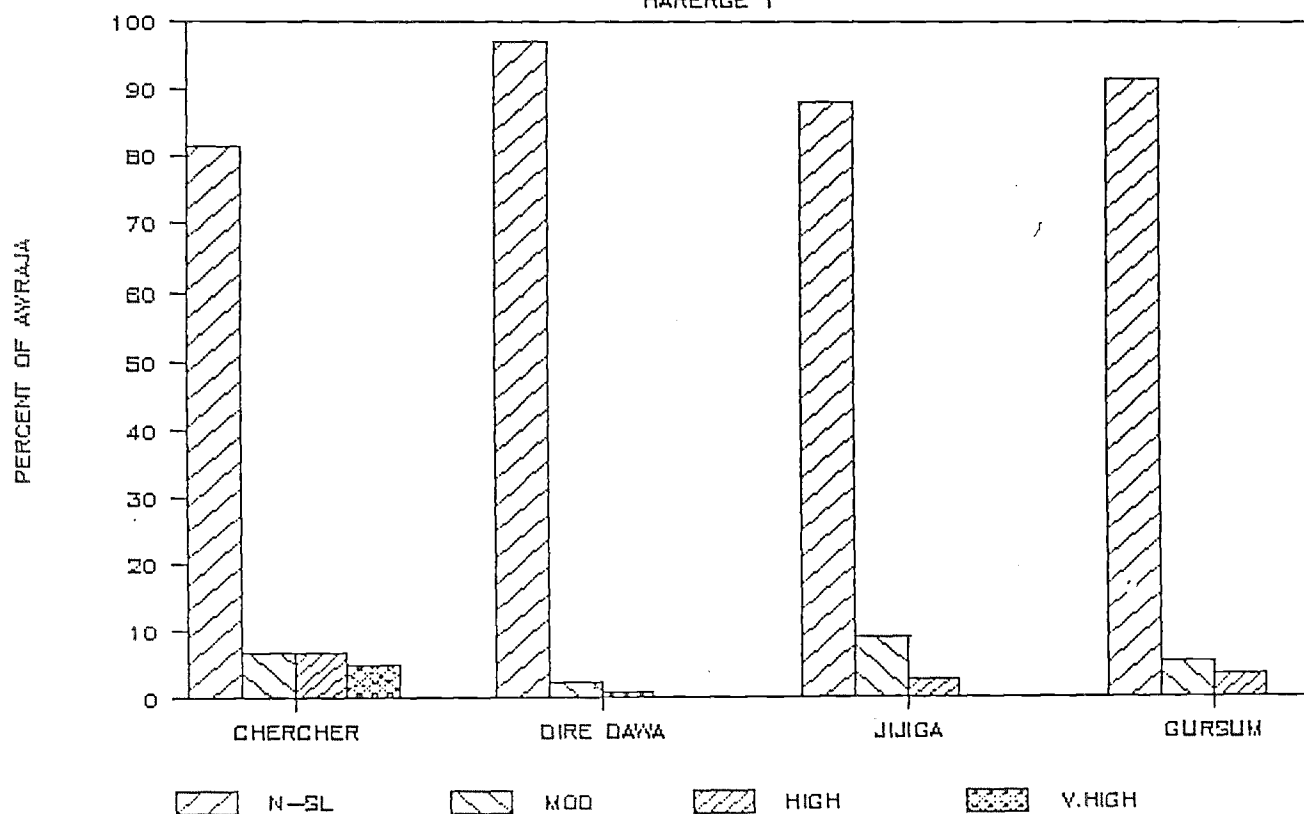
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GONDER 2



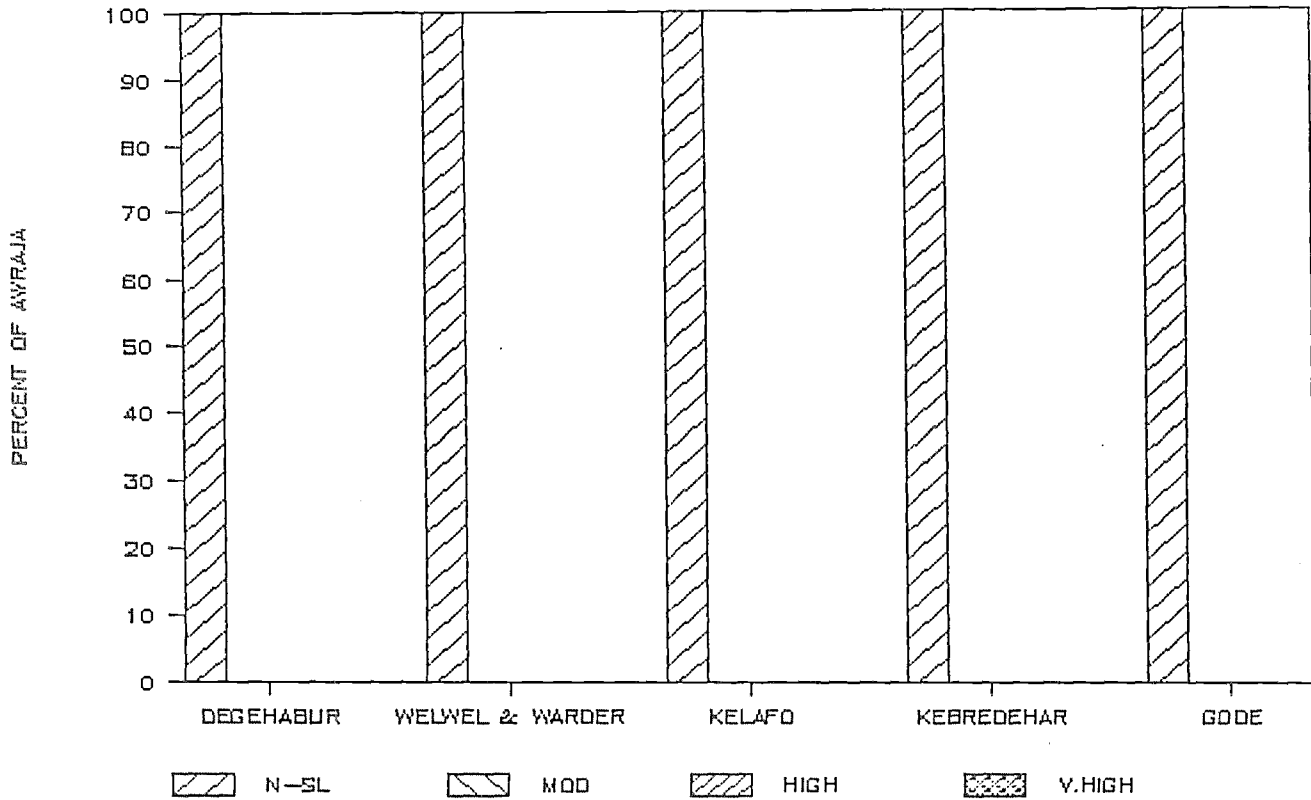
ESTIMATED SOIL LOSS RATE

HARERGE 1



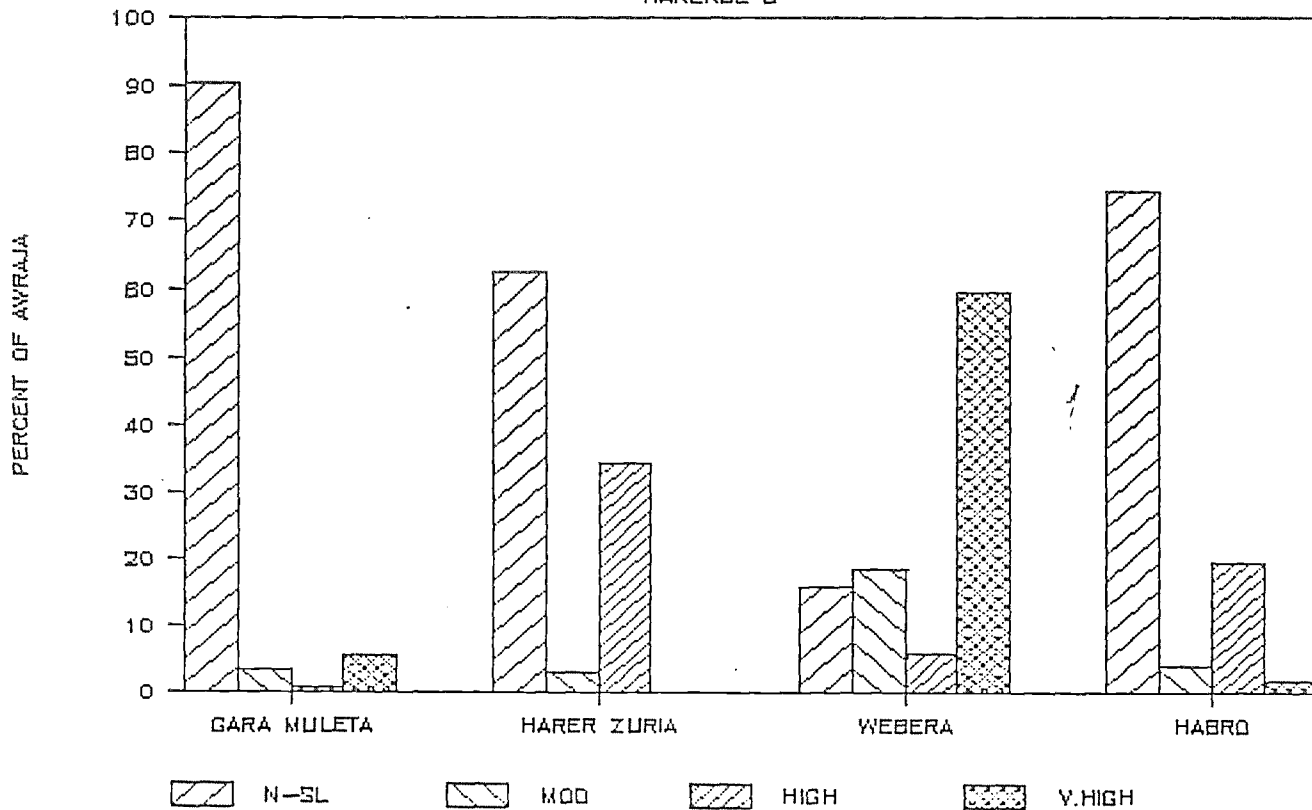
ESTIMATED SOIL LOSS RATE

HARERGE 2



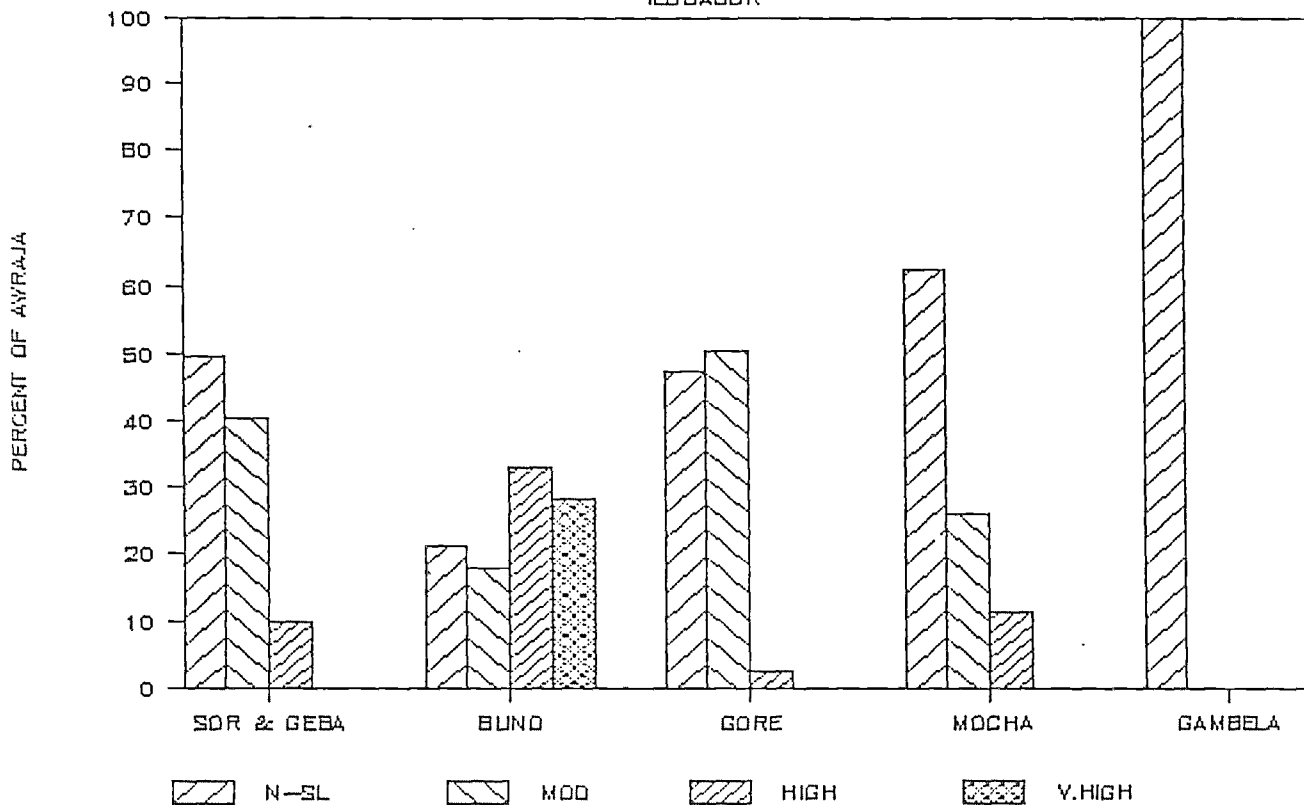
ESTIMATED SOIL LOSS RATE

HARERGE 3



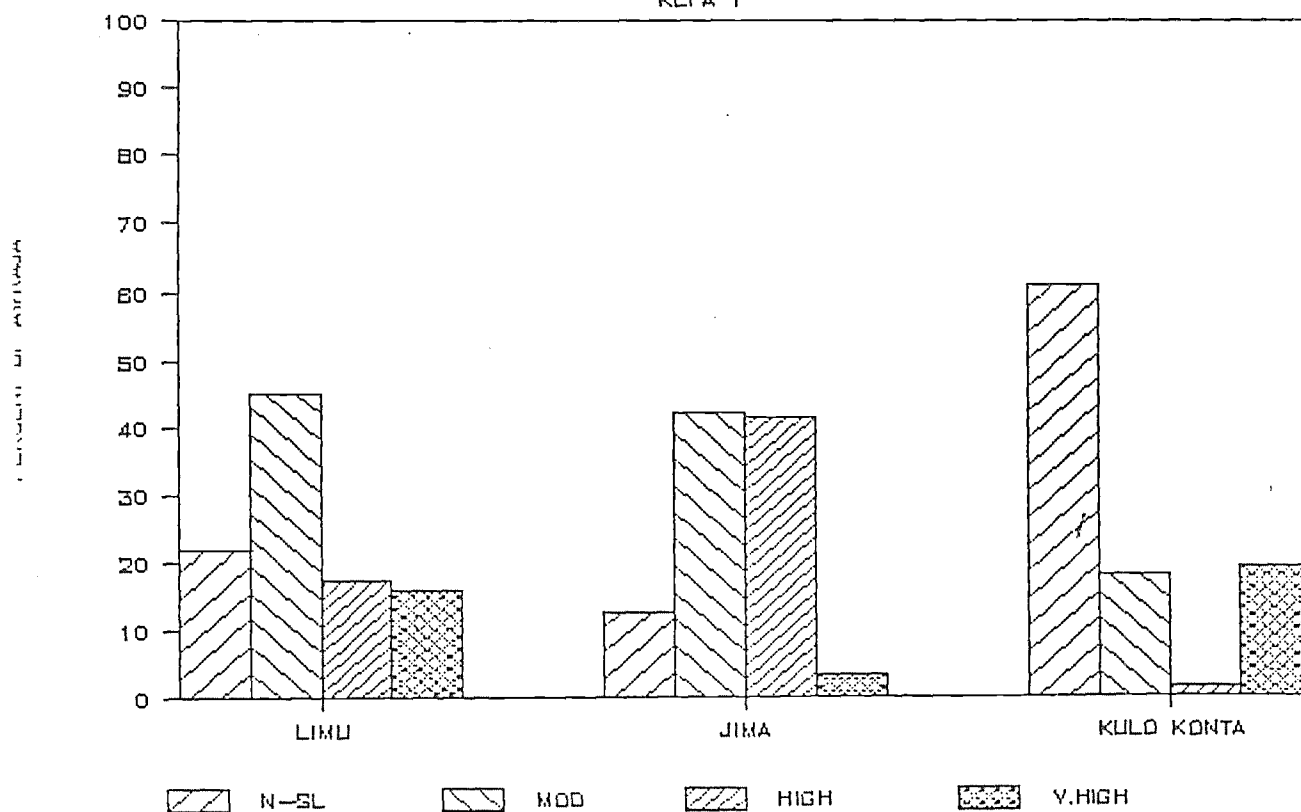
ESTIMATED SOIL LOSS RATE

ILLIBABOR



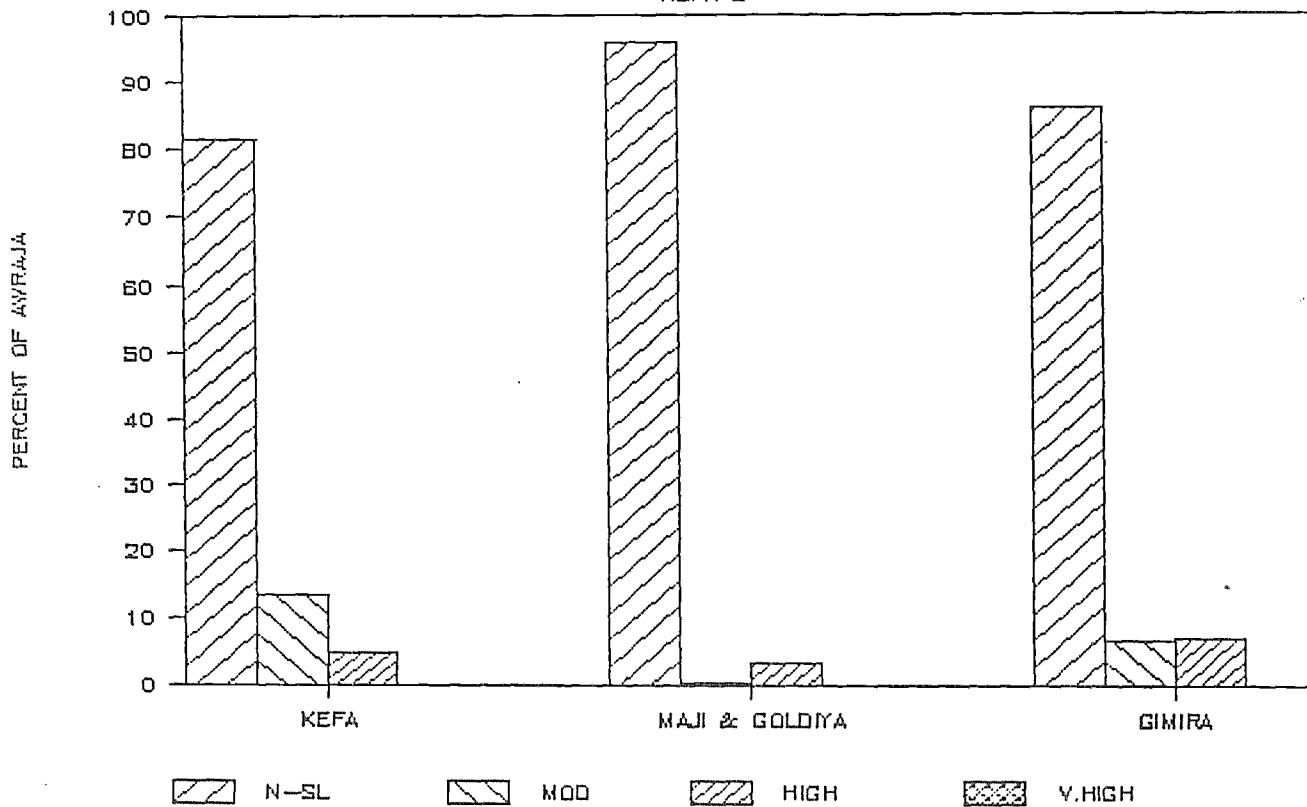
ESTIMATED SOIL LOSS RATE

KEFA 1



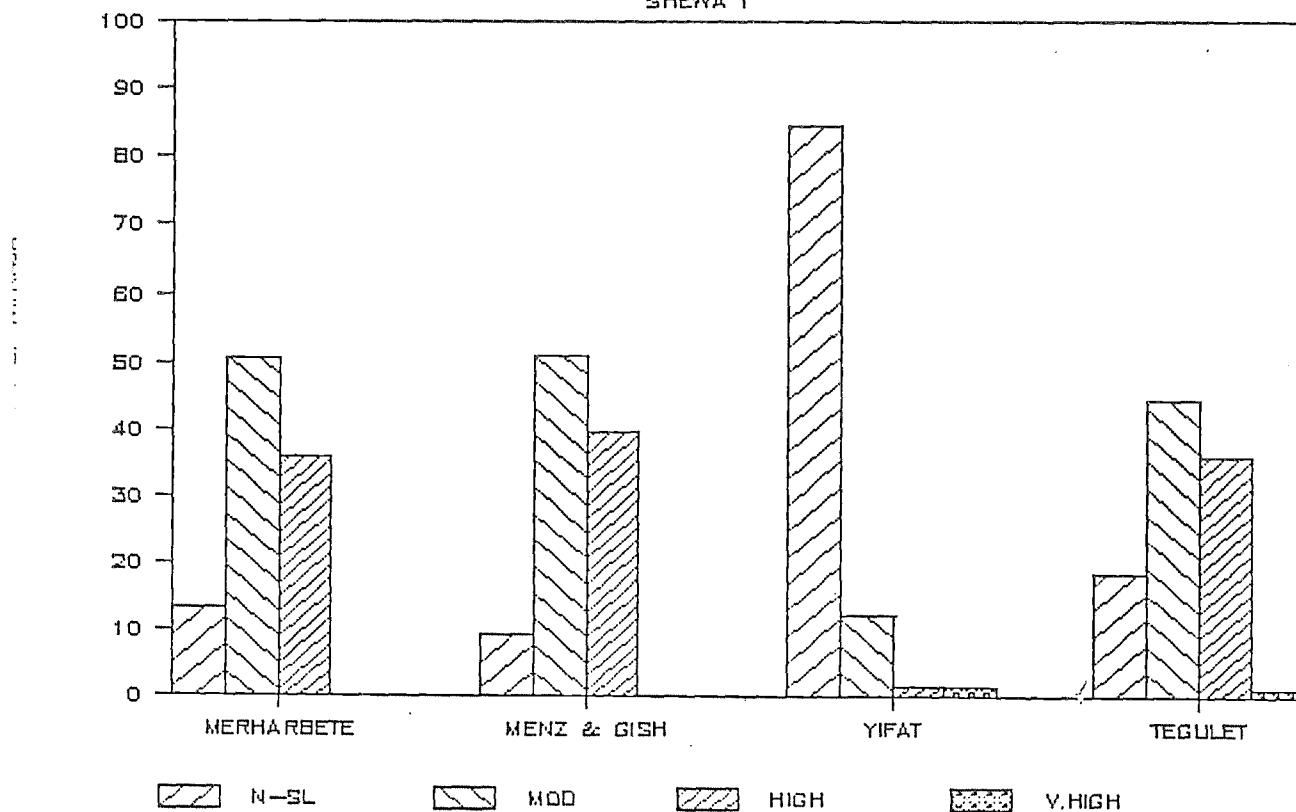
ESTIMATED SOIL LOSS RATE

KEFA 2



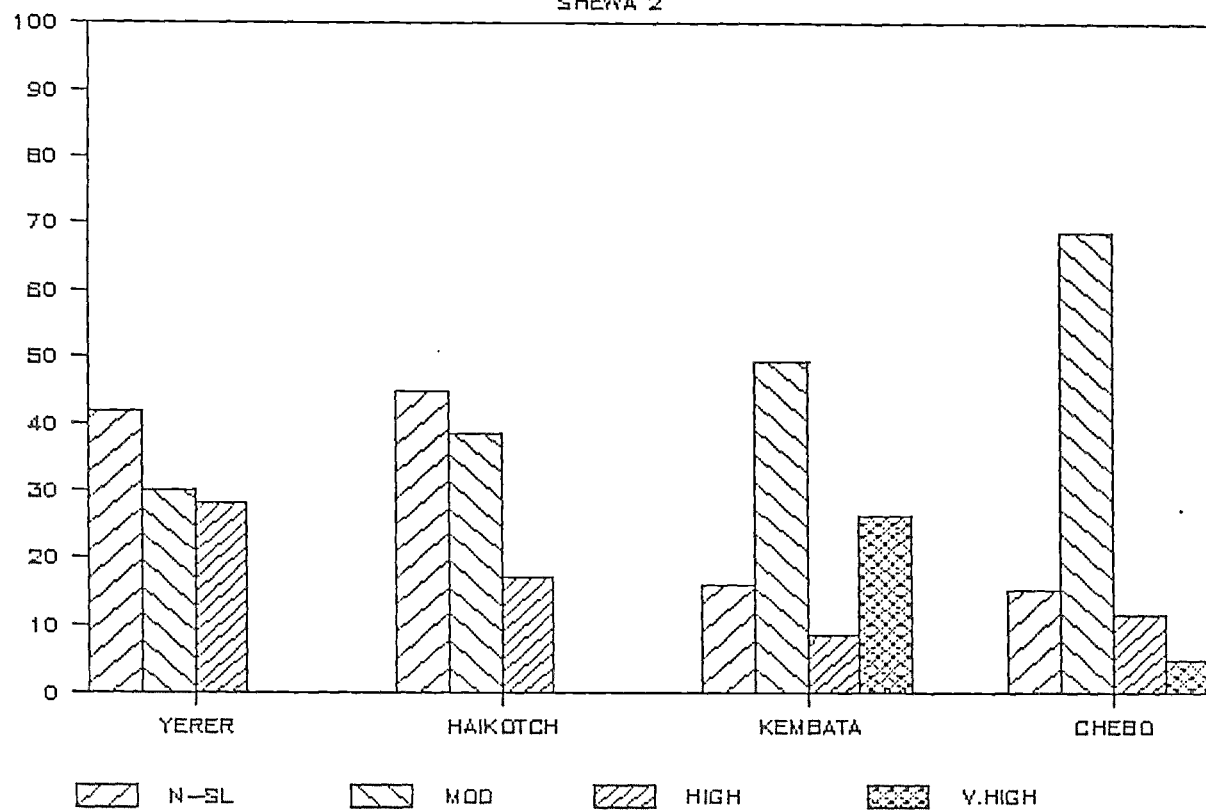
ESTIMATED SOIL LOSS RATE

SHEWA 1



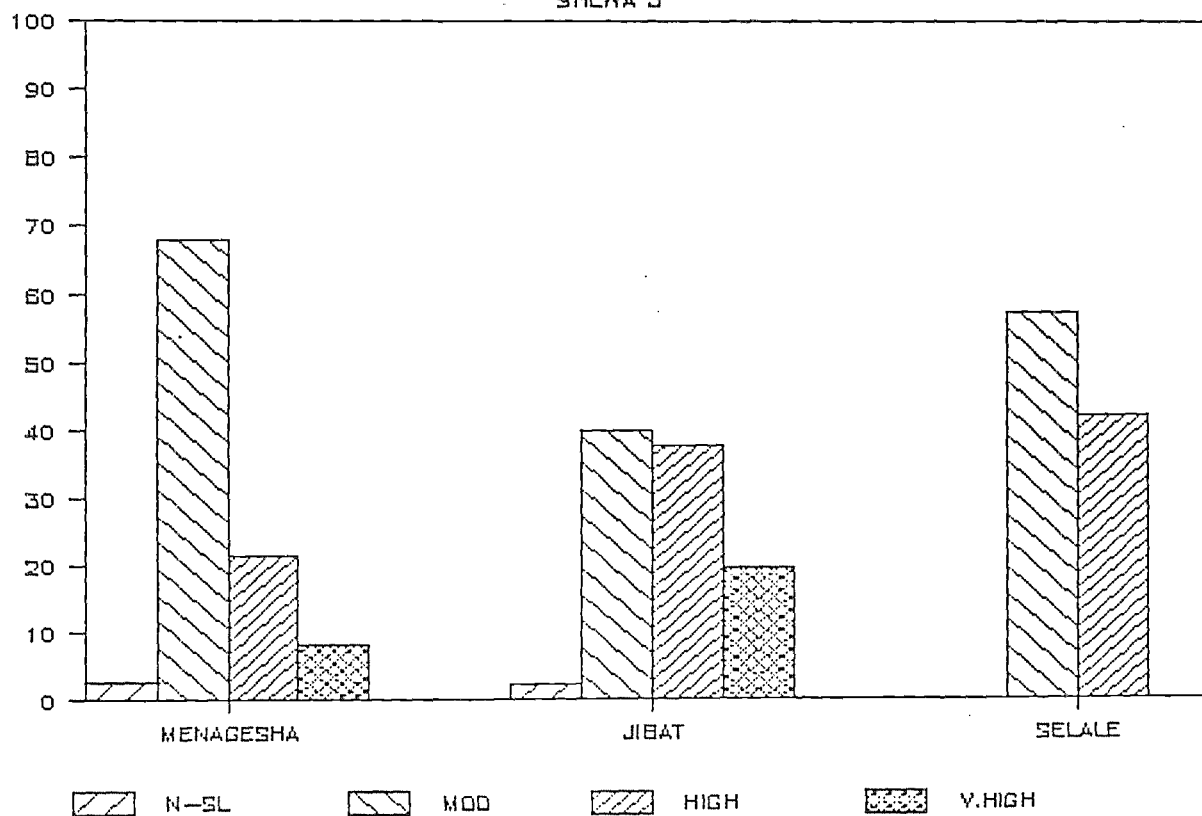
ESTIMATED SOIL LOSS RATE

SHEWA 2



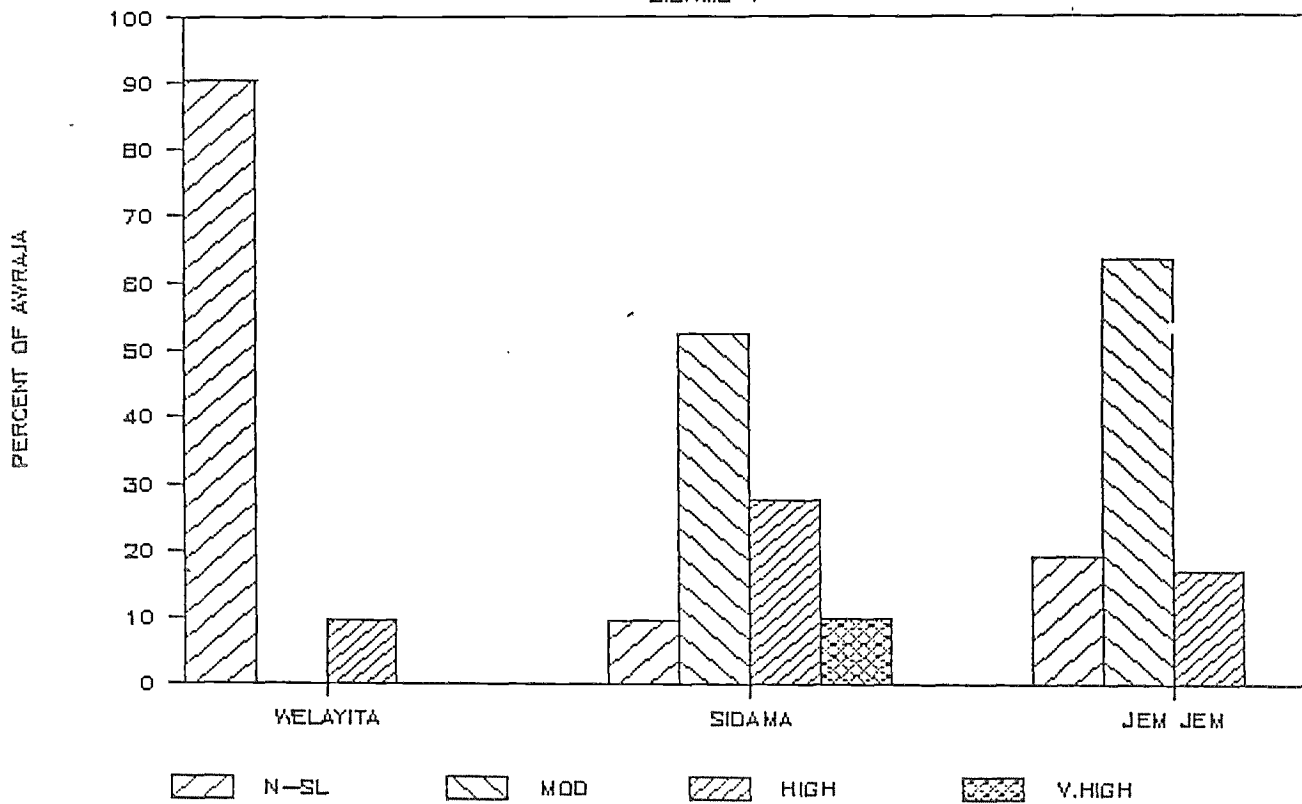
ESTIMATED SOIL LOSS RATE

SHEWA 3



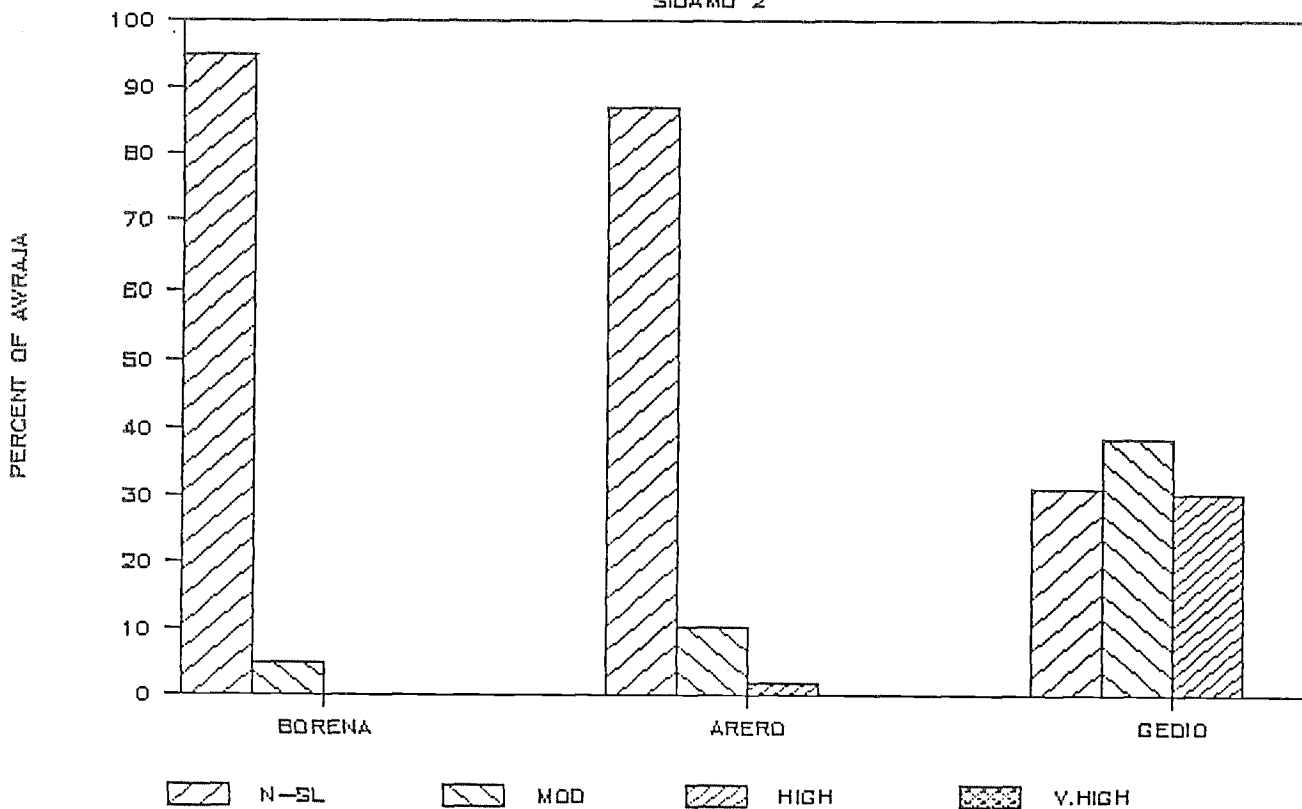
ESTIMATED SOIL LOSS RATE

SIDAMO 1



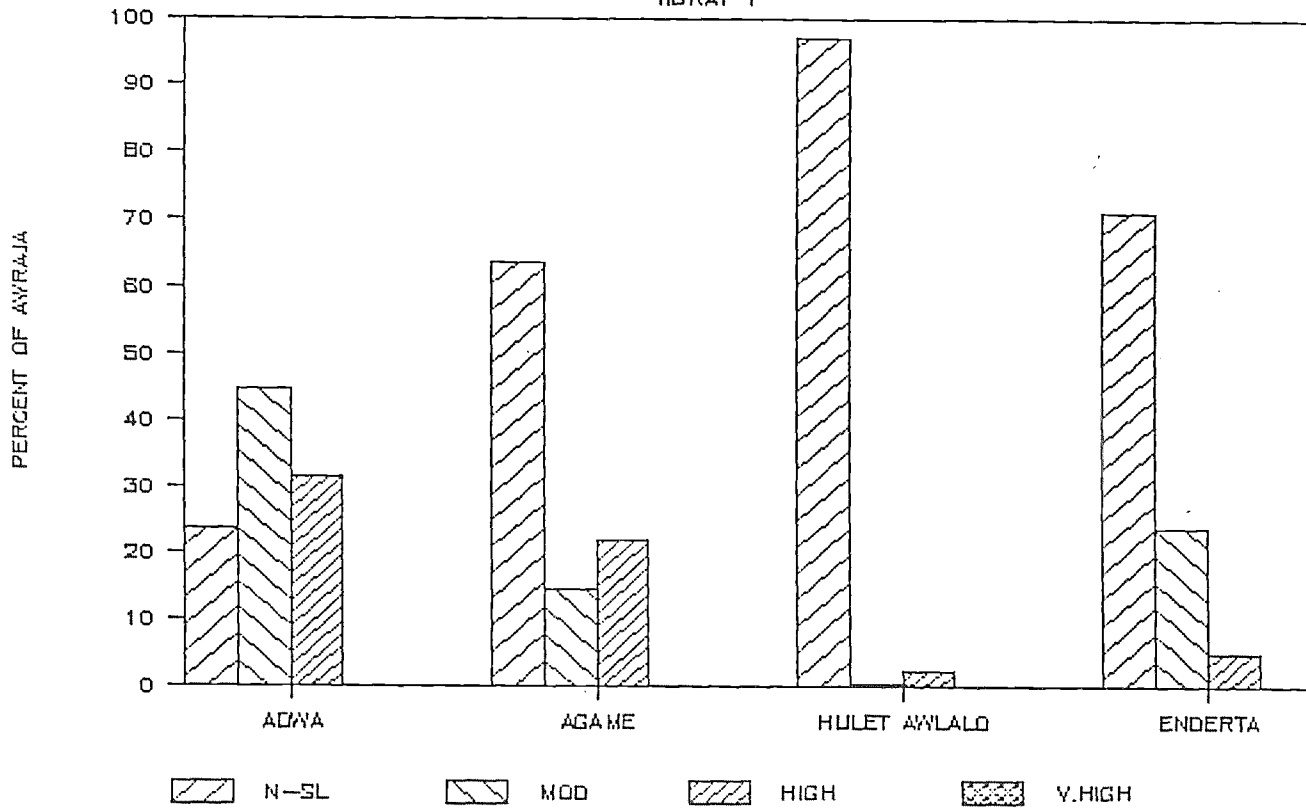
ESTIMATED SOIL LOSS RATE

SIDAMO 2



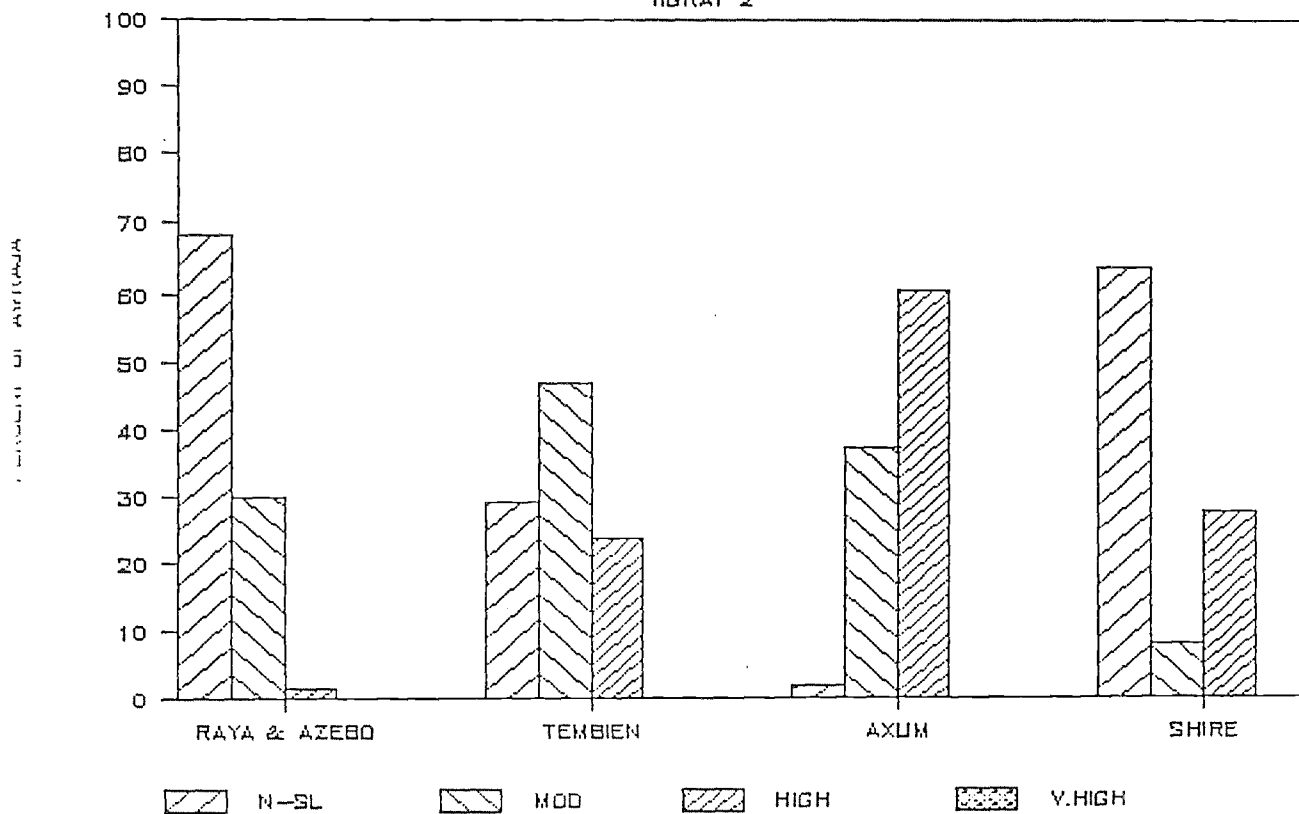
ESTIMATED SOIL LOSS RATE

TIGRAY 1



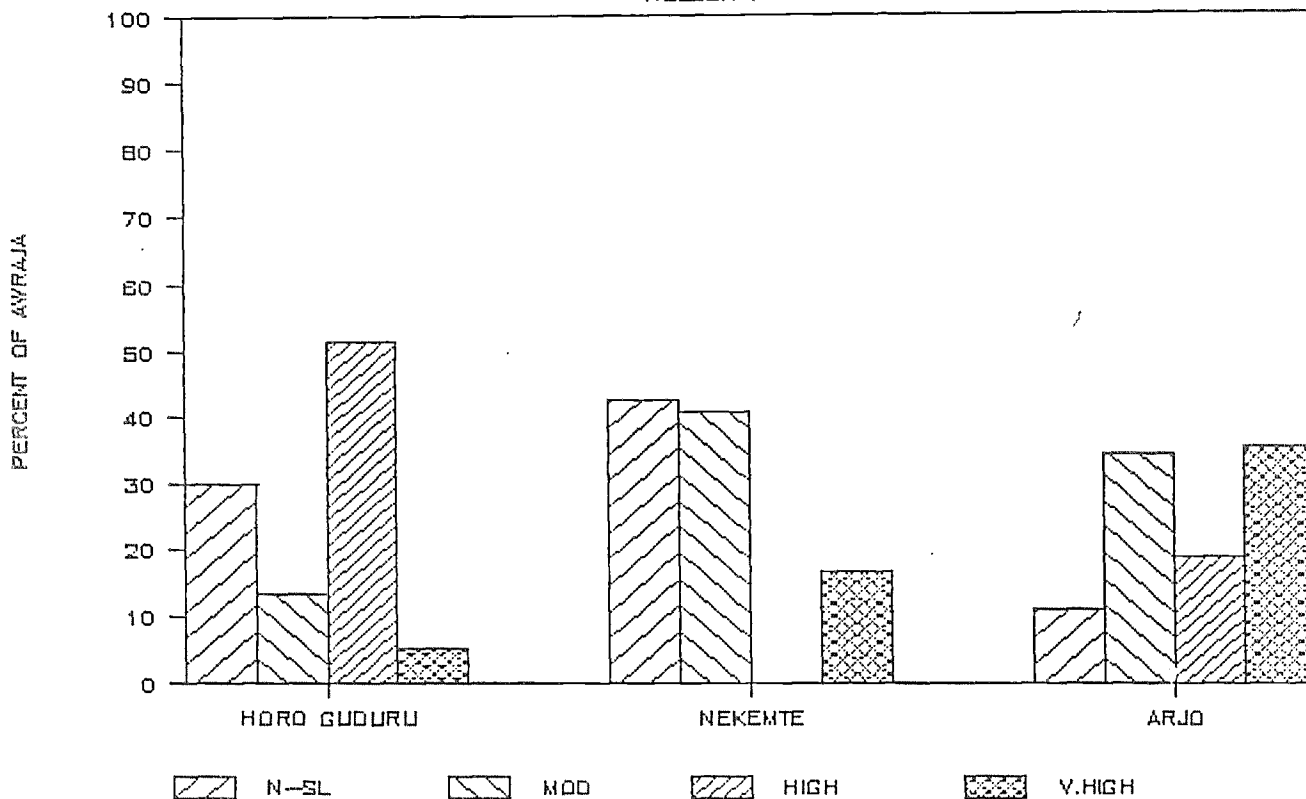
ESTIMATED SOIL LOSS RATE

TIGRAY 2



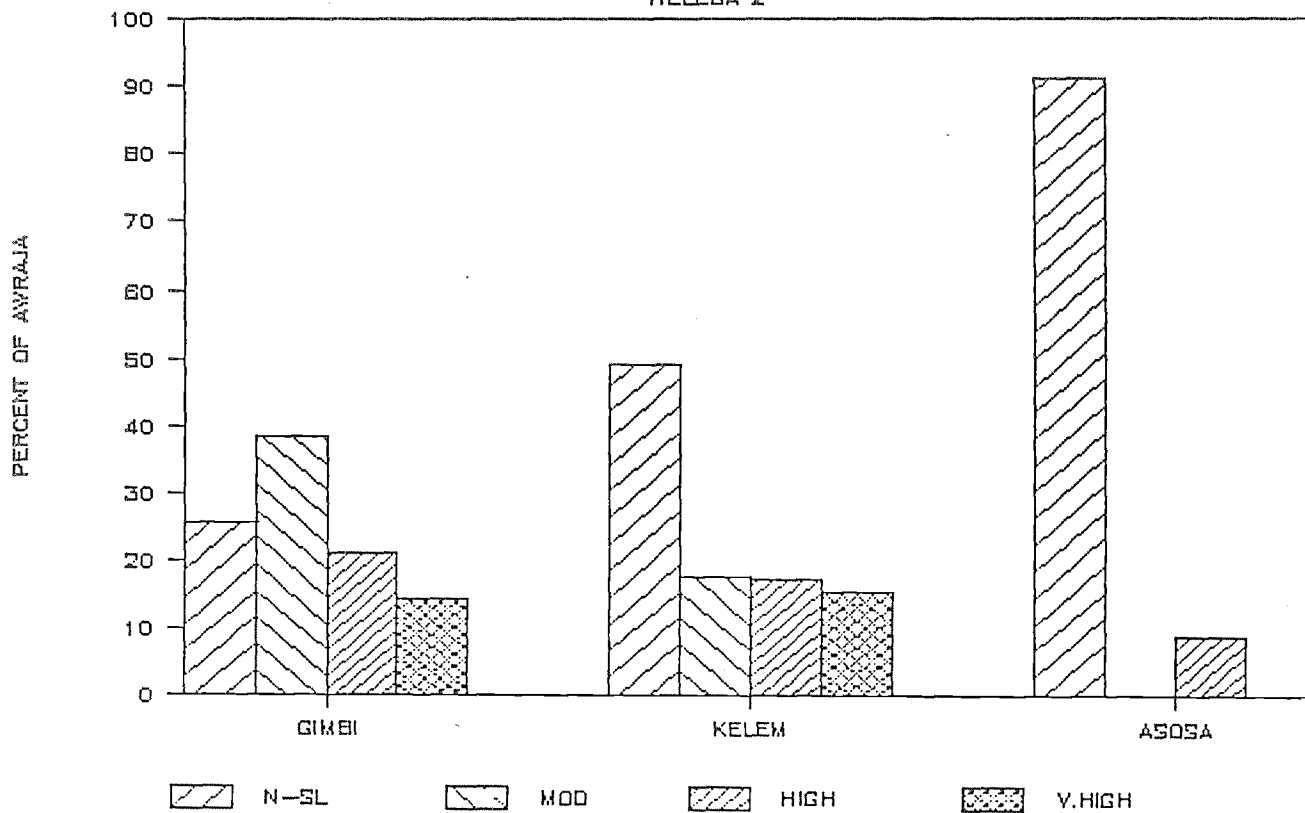
ESTIMATED SOIL LOSS RATE

WELEGA 1



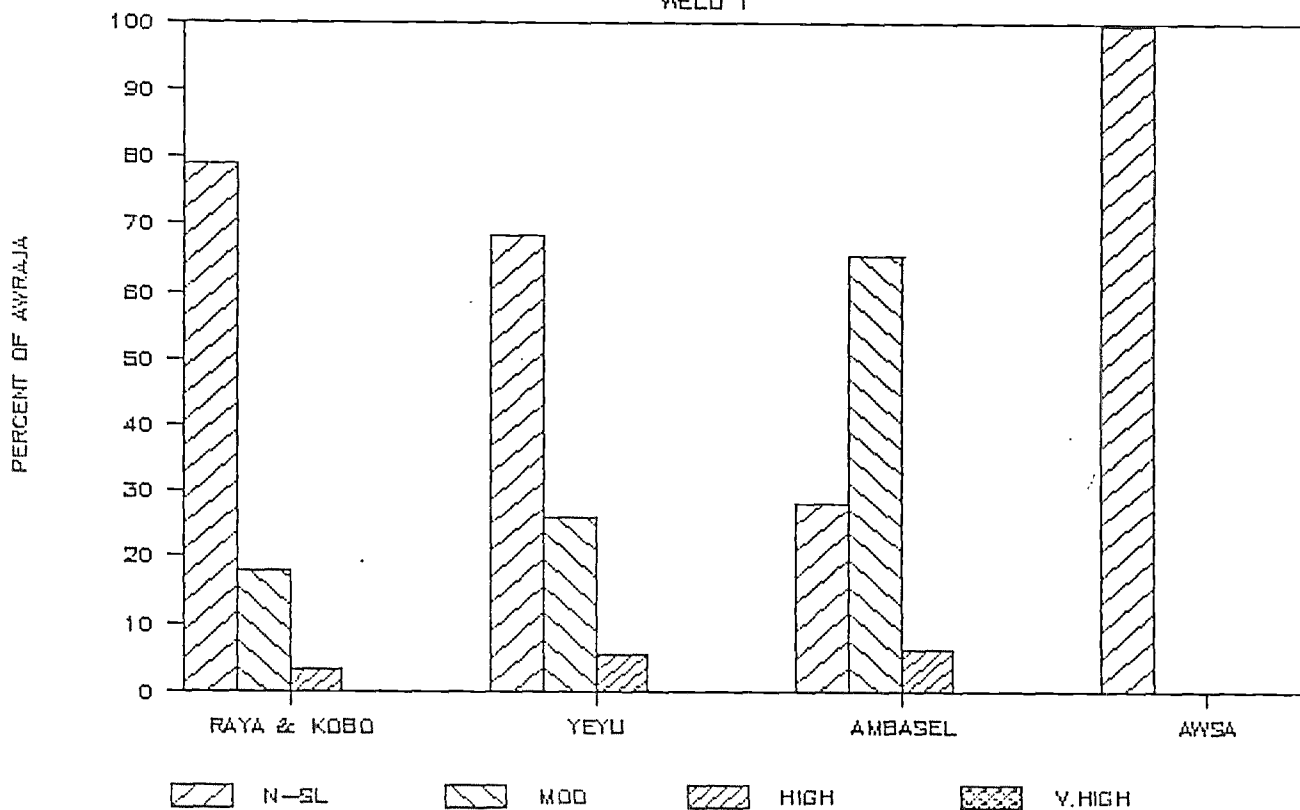
ESTIMATED SOIL LOSS RATE

WELEGA 2



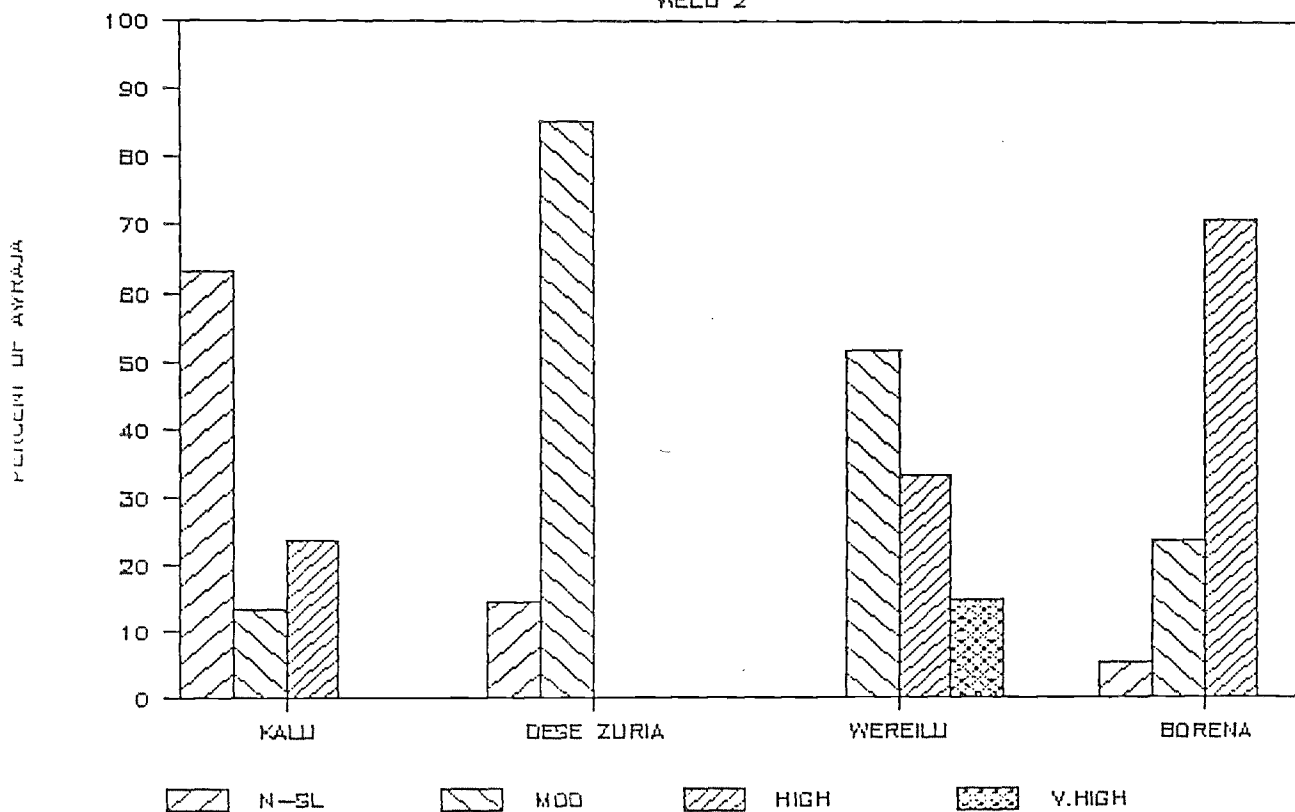
ESTIMATED SOIL LOSS RATE

WELD 1



ESTIMATED SOIL LOSS RATE

WELD 2



ESTIMATED SOIL LOSS RATE

WELD 3

