ANNUAL RAINFALL ANDHRA PRADESH KARNATAKA HARMAPURI 1000 - 1500 2 750 – 1000 KERALA AGRO-ECOLOGICAL ANDHRA PRADESH SUB-REGIONS SHEET INDEX SHEET 2 KARNATAKA Western Ghat, Hot perhumid with 210 + days LGP Government of India Copyright 1996 Cartographed, typeset and printed by Based upon Survey of India map with the permission of the Surveyor General of India. Tamil Nadu uplands, Hot The responsibility for the correctness of internal details rests with the publisher. TTK PHARMA LIMITED - PRINTING DIVISION OCEAN INDIAN Semi arid with 90-150 The territorial waters of India extend into the sea to a distance of twelve nautical miles days LGP 328, GST Road, Chromepet measured from the appropriate base line. Chennai-600 044. INDIA The topographical detail within India is based upon Survey of India map with the permission of Surveyor General of India. Scale 1:30,00,000 1Cm = 30 Kms. Source: Basic Resource Atlas of Tamil Nadu (1983) INDIAN OCEAN SOILS OF SOUTH DECCAN PLATEAU O Loamy-skeletal, mixed, Typic 80.27 Shallow, somewhat excessively drained, gravelly Very deep, well drained, clayey soils on gently O Fine, mixed, Typic Ustropepts Clayey-skeletal, mixed, Typic O Very-fine, kaolinitic, Kandic 10.35 loam soils on undulating lands, severely eroded sloping lands, slightly eroded; associated with; gravelly clay soils on moderately steeply sloping, associated with; moderately shallow, well sloping lands, slightly eroded; associated with; very deep, well drained, loamy soils low hills, severely eroded; associated with; deep, well drained, clayey soils. drained, gravelly loam soils. O Fine, mixed, Rhodic Paleustalfs moderately shallow, somewhat excessively drained, gravelly clay soils. Moderately deep, well drained, calcareous, O Loamy-skeletal, mixed Typic Moderately deep, well drained, clayey soils on O Fine, mixed, Typic Ustropepts O Fine-loamy, mixed, Typic gravelly loam soils on gently sloping lowlands, Moderately deep, well drained, stratified, loamy undulating summits, severely eroded; associated Deep, somewhat excessively drained, gravelly Clayey-skeletal, mixed, Typic soils on nearly level, tank-irrigated lowlands moderately eroded; associated with; shallow, with; deep, well drained, loamy soils on gently Loamy-skeletal, mixed, Typic clay soils on moderately steeply sloping, low Fine-loamy, slightly eroded; associated with; deep, well well drained, gravelly loam soils. O Fine, mixed, Typic Ustropepts ills, severely eroded; associated with; drained, clayey soils. moderately shallow, well drained, gravelly clay Loamy-skeletal, mixed, Typic soils on undulating, low hills with moderate Deep, moderately well drained, clayey soils on O Fine, mixed, Typic Ustropepts SOILS OF PLAINS gravelly loam soils on undulating, low hills, nearly level lowlands, slightly eroded severely eroded; associated with; moderately O Fine, mixed, Typic Haplustalfs deep, somewhat excessively drained, gravelly Deep well drained, clayey soils on moderately Clayey, kaolinitic, Isothermic, 35.81 O Clayey-skeletal, kaolinitic, Kandic Very deep, well drained, gravelly clay soils on steeply sloping hill ranges, moderately eroded; gently sloping lands, slightly eroded; associated clay soils on moderately steeply sloping, low hills associated with; shallow, well drained, gravelly with; very deep, well drained, clayey soils. Clayey-skeletal, O Fine, kaolinitic, Kandic Paleustalfs Very deep, moderately well drained, clayey soils O Fine mixed, Typic Ustropepts O Loamy-skeletal, mixed, Typic 114.72 clay soils isothermic, Oxic Humitropepts on gently sloping valleys, moderately drained, calcareous, gravelly loam soils on eroded; associated with; very deep, imperfectly O Fine mixed, Typic Haplustalfs nearly level lands, moderately eroded; O Fine, mixed, Typic Haplustalfs Deep, well drained, clayey soils on steeply O Clayey, kaolinitic, isothermic, 11.25 Moderately shallow, well drained, gravelly clay O Clayey-skeletal, kaolinitic, Kandic 13.37 drained, clayey soils. associated with; moderately deep, calcareous, sloping high hills and hill ranges, severely Typic Haplohumults soils on undulating lands, moderately eroded; clayey soils on gently sloping lands associated with; deep, moderately well drained, O Fine, mixed, Typic Ustropepts eroded; associated with; deep, somewhat Fine, kaolinitic, isothermic, Oxic Deep, somewhat excessively drained, clayey O Fine, mixed, Typic Ustropepts excessively drained, clayey soils calcareous, clayey soils on gently sloping lands soils on moderately steeply sloping, high hill Shallow, somewhat excessively drained, gravelly O Loamy-skeletal, mixed, Typic 75.37 with slight erosion. loam soils on moderately sloping footslopes, ranges, severely eroded. O Fine, mixed, Typic Haplustalfs severally eroded; associated with; moderately O Fine, mixed, Typic Haplustalfs Moderately shallow, well drained, clayey soils on Clayey, mixed, isothermic, Typic 96.51 Very deep, moderately well drained, loamy soils O Fine-loamy, mixed, Kandic 66.41 moderately steeply sloping, high hill ranges, deep, well drained, clayey soils on undulating on gently sloping lands, moderately eroded; Paleustalfs moderately eroded; associated with; moderately associated with; very deep, moderately well O Fine, kaolinitic, Kandic Paleustalfs Fine-loamy, mixed, isothermic, Moderately shallow, well drained, calcareous, shallow, well drained, loamy soils Typic Dystropepts clayey soils of gently sloping, interhill basins, O Fine, mixed, Typic Ustropepts O Loamy-skeletal, mixed, Typic 51.90 Shallow, moderately well drained, calcareous, slightly eroded; associated with; very deep, well gravelly loam soils on gently sloping low-lands, Deep, moderately well drained, cracking clay O Fine, montmorillonitic, Typic 3.62 drained, stratified, loamy soils. Very deep, well drained, clayey soils on very O Fine, kaolinitic, Kandic Paleustalfs 13.89 O Fine-loamy, mixed, Typic slightly eroded; associated with; very deep, well soils of gently sloping valleys, slightly eroded Coarse-loamy over sandy, mixed. gently sloping lands, moderately eroded; associated with; moderately well drained, clayey O Fine, mixed, Typic Ustropepts drained, calcareous, stratified loamy soils associated with; moderately deep, well drained, O Fine-loamy, mixed, Kandic Shallow, well drained, calcareous, clayey soils O Fine, mixed, Typic Ustropepts Moderately shallow, well drained, gravelly loam O Loamy-skeletal, mixed, Typic 10.29 f gently sloping valleys, slightly eroded; associated with; moderately deep, well drained, soils on undulating hills, severely eroded; Deep, moderately well drained, calcareous, O Fine, montmorillonitic, Entic 83.55 Fine-loamy, mixed, Typic associated with; shallow, well drained, gravelly Very deep, well drained, clayey soils on gently O Fine, kaolinitic, Kandic Paleustalfs 117.79 calcareous, stratified, loamy soils. Loamy-skeletal, mixed, Typic cracking clay soils on nearly level lands, slightl sloping lands, moderately and severely eroded eroded; associated with; very deep, imperfectly O Fine, montmorillonitic, Udic Very deep, moderately well drained, calcareous, O Fine, mixed, Typic Ustropepts associated with; moderately deep, well drained, drained, calcareous, cracking clay soils with O Fine-loamy, mixed, Kanhaplic clayey soils on gently sloping lowlands, slightly loamy soils on nearly level lands with slight moderate erosion. O Loamy-skeletal, mixed, Typic Moderately deep, somewhat excessively eroded; associated with; deep, well drained, Fine-loamy, mixed, Typic stratified, loamy soils. moderately eroded; associated with; rock O Rock outcrops Ustifluvents Moderately deep, moderately well drained, O Fine montmorillonitic, Udic Very deep, well drained, clayey soils on nearly O Fine, kaolinitic, Kandic Paleustalfs 39.46 calcareous, cracking clay soils on nearly level level lands, slightly eroded; associated with; very Fine-loamy, mixed, Fluventic 94.73 Very deep, moderately well drained, loamy soils O lands, slightly eroded; associated with; O Fine, mixed, Typic Ustropepts deep, well drained, loamy soils with moderate nearly level valleys, slightly eroded; O Fine-loamy, moderately shallow, well drained, calcareous, Deep, well drained, gravelly clay soils on O Clayey-skeletal, mixed, Typic 75.64 associated with; deep, moderately well drained, O Fine, mixed, Typic Ustropepts. clayey soils on gently sloping lands moderately sloping, low hills, severely eroded; associated with; moderately shallow, well O Loamy-skeletal, mixed, Typic Deep, well drained, clayey soils on nearly level O Fine, kaolinitic, Kandic Paleustalfs drained, gravelly loam soils on undulating, O Rock land Rock outcrops lands, slightly eroded; associated with; deep, Deep, moderately well drained, calcareous, O Fine-loamy mixed, Fluventic 40.13 well drained, clayey soils on gently sloping lands. O Fine, kaolinitic, Oxic Ustropepts loamy soils on gently sloping lowlands, slightly eroded; associated with; deep, moderately well O Fine, mixed, Typic Ustropepts Moderately shallow, somewhat excessively O Clayey-skeletal, mixed, Typic drained, calcareous clayey soils. drained, gravelly clay soils on undulating, Very deep, excessively drained, sandy soils on O Sandy, mixed, Psammentic 25.54 isolated hills/hillocks, severely eroded; O Clayey-skeletal, mixed, Lithic gently sloping lands, severely eroded; associated associated with; shallow, somewhat excessively Very deep, moderately well drained, calcareous Rock outcrops; associated with; moderately O Rock land with; very deep, well drained, loamy soils on very drained, gravelly clay soils. loamy soils on gently sloping lowlands, slightly O Fine-loamy, mixed, Fluventic 81.02 O Fine-loamy, mixed, Rhodic shallow, well drained, clayey soils on undulating gently sloping lands with moderate erosion. eroded; associated with; very deep, moderately lands, moderately eroded. O Fine, mixed, Rhodic Paleustalfs Moderately deep, well drained, gravelly clay soils O Clayey-skeletal, mixed, Typic 61.28 well drained, cracking clay soils. O Fine, montmorillonitic, Vertic on gently sloping lands, severely eroded; Deep, moderately well drained, clayey soils on O Clayey-skeletal, mixed, Rhodic 17.90 associated with; moderately shallow, well O Fine, mixed, Rhodic Paleustalfs gently sloping lands, slightly eroded; associated Rock outcrops; associated with; moderately O Rock land Paleustalfs drained, clayey soils. with; very deep, well drained, clayey soils on O Fine, mixed, Rhodic Paleustalfs shallow, well drained, gravelly clay soils on Very deep, well drained, clayey soils on nearly O Fine, mixed, Fluventic Ustropepts gently sloping lands, slightly eroded level lowlands, slightly eroded; associated with; O Clayey-skeletal, mixed, Typic Deep, somewhat excessively drained, gravelly Clayey-skeletal, mixed, Typic very deep, moderately well drained, calcareous, O Fine, mixed, Typic Ustropepts clay soils on undulating, low hills, severely Shallow, well drained, gravelly clay soils on O Clayey-skeletal, mixed, Rhodic 30.10 eroded; associated with; very deep, somewhat Clayey-skeletal, mixed, Typic gently sloping lands, moderately eroded; Rock outcrops; associated with; moderately O Rock land excessively drained, gravelly clay soils. associated with; moderately shallow, well shallow, somewhat excessively drained, gravelly O Clayey-skeletal, mixed, Typic Deep, poorly drained, clayey soils on gently O Fine, mixed, Fluventic Ustropepts loam soils on moderaely steeply sloping hills, O Loamy-skeletal, mixed, Typic drained, gravelly clay soils. sloping lowlands, slightly eroded; associated Deep, well drained, loamy soils on gently sloping Coarse-loamy, mixed, Typic severely eroded. with; very deep, moderately well drained, loamy Fine-loamy over sandy, mixed, lowlands, moderately eroded. O Clayey-skeletal, mixed, Rhodic 51.98 Moderately deep, somewhat excessively O Fine-loamy, Rock outcrops; associated with; shallow, well O Rock land drained, gravelly clay soils on gently sloping Paleustalfs Rhodustalfs lands, slightly eroded; associated with; drained, gravelly loam soils on undulating lands, O Fine, mixed, Typic Haplustalfs Very shallow, somewhat excessively drained, Loamy-skeletal, mixed, Lithic moderately deep, well drained, clayey soils. gravelly loam soils on moderately sloping, O Loamy-skeletal, mixed, Typic Deep, moderately well drained, calcareous, isolated hillocks, severely eroded; associated O Loamy-skeletal, mixed, Typic loamy soils of nearly level valleys, slightly Ustropepts with; moderately shallow, somewhat excessively O Fine-loamy, mixed, Rhodic 24.92 eroded; associated with; deep, imperfectly O Fine, mixed, Typic Ustropepts loamy soils on gently sloping ridges, moderately and severely eroded; associated with, very deep, drained, gravelly loam soils. Paleustalfs drained, calcareous, clayey soils. Rock outcrops; associated with; shallow, well O Rock land Very shallow, somewhat excessively drained, O Loamy-skeletal, mixed, Lithic 22.79 Sandy, mixed, Psammentic drained, loamy soils on moderately steeply excessively drained, sandy soils. gravelly loam soils on moderately steeply Deep, well drained, loamy soils on gently sloping sloping, isolated hills/hillocks, severely eroded; O Loamy-skeletal, mixed, Typic sloping, low hills, severely eroded. O Loamy, mixed, Lithic Ustorthents lands, severely eroded; associated with; deep, associated with; moderately shallow, somewhat Coarse-loamy, mixed, Rhodic Very deep, somewhat excessively drained, well drained, gravelly loam soils. O Loamy-skeletal, mixed, Typic excessively drained, gravelly loam soils. loamy soils on very gently sloping lands, severely Paleustalfs Rock outcrops; associated with; moderately O Rock land eroded; associated with; very deep, excessively Sandy over loamy, mixed, Typic Loamy-skeletal, mixed, Lithic Shallow, excessively drained, gravelly loam soils O shallow, somewhat excessively drained, gravelly drained, sandy soils. on rolling lands, severely eroded; associated Moderately deep, well drained, loamy soils of O Fine-loamy, loam soils on steeply sloping, isolated hills, O Loamy-skeletal, mixed, Typic with; shallow, somewhat excessively drained, gently sloping, interhill basins/valleys, Clayey-skeletal, mixed, Lithic O Fine, mixed, Rhodic Paleustalfs Very deep, well drained, clayey soils on gently gravelly clay soils moderately eroded; associated with; moderately O Fine, mixed, Typic Rhodustalfs sloping lands, severely eroded; associated with shallow, well drained, clayey soils. very deep, well drained, gravelly clay soils. Rock outcrops; associated with; shallow, Clayey-skeletal, mixed, Rhodic Shallow, well drained, gravelly loam soils on O Loamy-skeletal, mixed, Lithic 204.31 somewhat excessively drained, gravelly loam steep hillslopes, severely eroded; associated Moderately shallow, well drained, loamy soils on O Fine-loamy, soils on undulating, isolated hillocks, severely Loamy-skeletal, mixed, Typic with; very shallow, well drained, loamy soils nearly level lands, moderately eroded; O Loamy, mixed, Lithic Ustorthents Moderately shallow, well drained, clayey soils on O Fine, mixed, Rhodic Paleustalfs 78.53 associated with; moderately shallow, well O Fine, mixed, Typic Haplustalfs Ustropepts gently sloping lands, severely eroded; associated drained, clayey soils with slight erosion. with; moderately deep, well drained, loamy soils. O Coarse-loamy, mixed, Typic Rock outcrops; associated with; shallow, well O Rock land 55.17 Shallow, well drained, gravelly clay soils on very O Clayey-skeletal, mixed, Lithic 10.33 drained, gravelly loam soils on moderately steeply sloping hillslopes, severely eroded; Moderately deep, poorly drained, clayey soils on O Fine, mixed, Typic Ustropepts sloping lands, moderately eroded. O Loamy-skeletal, mixed, Typic associated with; very shallow, well drained, nearly level lowlands, slightly eroded. Clayey-skeletal, mixed, Lithic Moderately deep, well drained, clayey soils on O Fine, mixed, Rhodic Paleustalfs 42.62 undulating lands, moderately eroded; associated with; rock outcrops. Rock outcrops; associated with; moderately O Rock outcrops Shallow, well drained, loamy soils on gently O Loamy, mixed, Lithic Ustropepts shallow, well drained, gravelly clay soils on Very deep, well drained, calcareous, clayey soils O Fine, mixed, Typic Ustropepts sloping lands, severely eroded; associated with, moderately sloping, isolated hillocks, moderately on nearly level lowlands, slightly eroded; Clayey-skeletal, mixed, Typic shallow, well drained, gravelly loam soils O Loamy-skeletal, mixed, Lithic Moderately deep, well drained, gravelly loam associated with; deep, well drained, calcareous, O Loamy-skeletal, mixed, Typic 29.97 O Clayey-skeletal, mixed, Typic soils on gently sloping lands, moderately eroded; gravelly clay soils. Rhodustalfs associated with; deep, well drained, clayey soils. O Fine, mixed, Typic Rhodustalfs Rock outcrops; associated with; shallow. Clayey, mixed, Lithic Ustropepts Shallow, excessively drained, clayey soils on O somewhat excessively drained, loamy soils on Deep, moderately well drained, calcareous, O Fine, mixed, Typic Ustropepts steeply sloping hills, severely eroded; associated moderately sloping hill ranges, very severely with; very shallow, somewhat excessively clayey soils on gently sloping lowlands, slightly Fine-loamy, Loamy-skeletal, mixed, Lithic Deep, well drained, gravelly clay soils on gently eroded; associated with; deep, well drained, O Clayey-skeletal, mixed, Typic 17.15 drained, gravelly loam soils Ustropepts O Fine-loamy, sloping lands, slightly eroded; associated with, calcareous, loamy soils. deep, well drained, gravelly soils on moderately Rock outcrops; associated with; moderately O Rock land Fine, montmorillonitic, Vertic Deep, moderately well drained, calcareous, deep, well drained, loamy soils on gently sloping sloping lands with moderate erosion. Deep, moderately well drained, clayey soils on O Fine, mixed, Typic Ustropepts clayey soils on gently sloping lowlands, slightly hills, moderately eroded. eroded; associated with; deep, well drained, O Fine-loamy, gently sloping lowlands, slightly eroded; mixed, Typic Clayey-skeletal, mixed, Typic Moderately shallow, well drained, gravelly clay O Clayey-skeletal, mixed, Typic 41.68 associated with; very deep, moderately well Ustropepts calcareous, gravelly clay soils. soils on gently sloping lands, slightly eroded: drained, calcareous, loamy soils associated with; deep, somewhat excessively Rock outcrops; associated with; very deep, well O Clayey-skeletal, mixed, Rhodic Deep, moderately well drained, calcareous O Fine, montmorillonitic, Vertic 41.17 drained, gravelly clay soils drained, loamy soils on moderately steeply Moderately shallow, well drained, calcareous, O Fine-loamy, cracking clay soils on nearly level lands, slightly sloping, high hills and escarpments, severely loamy soils on gently sloping lowlands, O Fine, montmorillonitic, Entic moderately eroded; associated with; shallow, Moderately deep, well drained, gravelly clay soils Clayey-skeletal, mixed, Typic 10.15 on gently sloping lands, severely eroded; well drained, calcareous, loamy soils associated with; moderately deep, well drained. Rock outcrops; associated with; shallow, O Fine, montmorillonitic, Vertic Loamy-skeletal, mixed, Typic Very deep, imperfectly drained, cracking clay somewhat excessively drained, loamy soils on gravelly loam soils. soils on gently sloping lowlands, slightly eroded; gently sloping hills, moderately eroded. Fine-loamy, Deep, moderately well drained, calcareous, O Fine, mixed, Typic ustropepts associated with; very deep, moderately well Clayey-skeletal, mixed, Typic O Clayey-skeletal, mixed, Typic 53.56 Moderately deep, well drained, gravelly clay soils drained, gravelly clay soils with moderate Ustropepts clayey soils on nearly level lowlands, slightly on gently sloping lands, moderately eroded; eroded; associated with; deep, moderately well O Fine-loamy, mixed, Typic Rhodustalfs associated with; moderately shallow, well Rock outcrops; associated with; shallow, well O Rock land 45.21 drained, calcareous, loamy soils Loamy-skeletal, mixed, Typic drained, loamy soils on undulating lands, Very deep, imperfectly drained, calcareous, O Fine, montmorillonitic, Vertic drained gravelly loam soils. cracking clay soils on gently sloping lands, moderately eroded. O Fine-loamy, Moderately deep, moderately well drained, O Fine, mixed, Typic Ustropepts slightly eroded; associated with; very deep, O Clayey-skeletal, mixed, Typic Deep, well drained, clayey soils on undulating O Fine, mixed, Typic Rhodustalfs Ustropepts clayey soils on nearly level lowlands, slightly moderately well drained, gravelly clay soils with eroded; associated with; very deep, moderately O Fine-loamy, mixed, Fluventic ridges, moderately eroded; associated with; rock Rock outcrops; associated with; deep, well O Rock land well drained, loamy soils O Rock outcrops Ustropepts drained, loamy soils on undulating, low hills, O Fine, montmorillonitic, Vertic Deep, imperfectly drained, calcareous, cracking Fine-loamy, Moderately shallow, well drained, clayey soils on O Fine, mixed, Typic Ustropepts clay soils on nearly level lowlands, slight Moderately deep, well drained, gravelly clay soils O Clayey-skeletal, kaolinitic, Kandic 65.99 Ustropepts eroded; associated with; very deep, imperfectly steeply sloping, high hills and escarpments, Very-fine, montmorillonitic, Udic on very gently sloping lands, moderately eroded; Rhodustalfs drained, calcareous, cracking clay soils. severely eroded; associated with; shallow, Loamy-skeletal, mixed, Lithic associated with; deep, well drained, gravelly Rock outcrops; associated with; moderately O Rock land somewhat excessively drained, gravelly loam Loamy-skeletal, mixed, Kandic deep, well drained, clayey soils on moderately Moderately shallow, well drained, gravelly loam Rhodustalfs Loamy-skeletal, mixed, isothersloping hills, severely eroded. O Fine, mixed, Typic Ustropepts soils on moderately sloping, high hill ranges, mic, Typic Dystropepts Moderately deep, well drained, clayey soils on O Fine, mixed, Typic Ustropepts Deep, well drained, gravelly clay soils on very O Clayey-skeletal, kaolinitic, Kandic 61.98 moderately eroded; associated with; shallow Loamy-skeletal, mixed, isothermic moderately sloping, high hills and hill ranges, gently sloping lands, severely eroded; associated well drained, gravelly loam soils. Lithic Dystropepts moderately eroded; associated with; shallow, with; shallow, somewhat excessively drained, Rock outcrops; associated with; moderately O Rock land Clayey-skeletal, mixed, Lithic mixed, well drained, gravelly clay soils shallow, excessively drained, gravelly loam soils loamy soiils Fine, mixed Typic Argiustolls Deep, well drained, clayey soils on steeply on very steeply sloping escarpments and sloping, high hills and hill ranges, severely Loamy-skeletal, mixed, Typic O Fine, mixed, Typic Ustropepts footslopes, severely eroded Shallow, somewhat excessively drained, gravelly O Clayey-skeletal, mixed, Lithic 20.43 eroded; associated with; moderately shallow, Eutropepts Fine-loamy, mixed, Typic drained, clayey soils on moderately steeply clay soils on moderately steeply sloping, isolated Rhodustalfs well drained, loamy soils. Haplustalfs hills, severely eroded; associated with; rock O Rock outcrops sloping hills/hill ranges, severely eroded; O Clayey, mixed, Lithic Ustropepts Rock outcrops; associated with; moderately O Rock land associated with; shallow, somewhat excessively shallow, excessively drained, gravelly loam soils drained, clayey soils on steeply sloping escarpments, severely Loamy-skeletal, mixed, Typic