



GEOTERRA
IMAGE

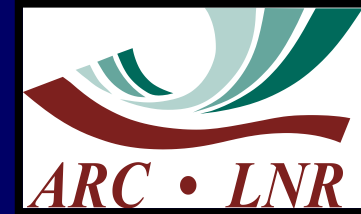
Unleashing
the **power of imagery**
improving your
business intelligence

Grain Silo Industry Mini Symposium 18 August 2014

Fanie Ferreira

National Crop Statistics Consortium

- **Agricultural Research Council**
 - Institute Soil Climate & Water:
 - Agro-metereology / Climatic conditoins
 - Summer Grain Institute: objective yield – maize
 - Field measurements:
 - Small Grain Institute: objective yield – wheat
 - Field measurements
- **SiQ**
 - PICES aerial surveys & interviews
 - Statistical processing
- **GeoTerraImage**
 - Satellite image processing
 - Crop type classifications



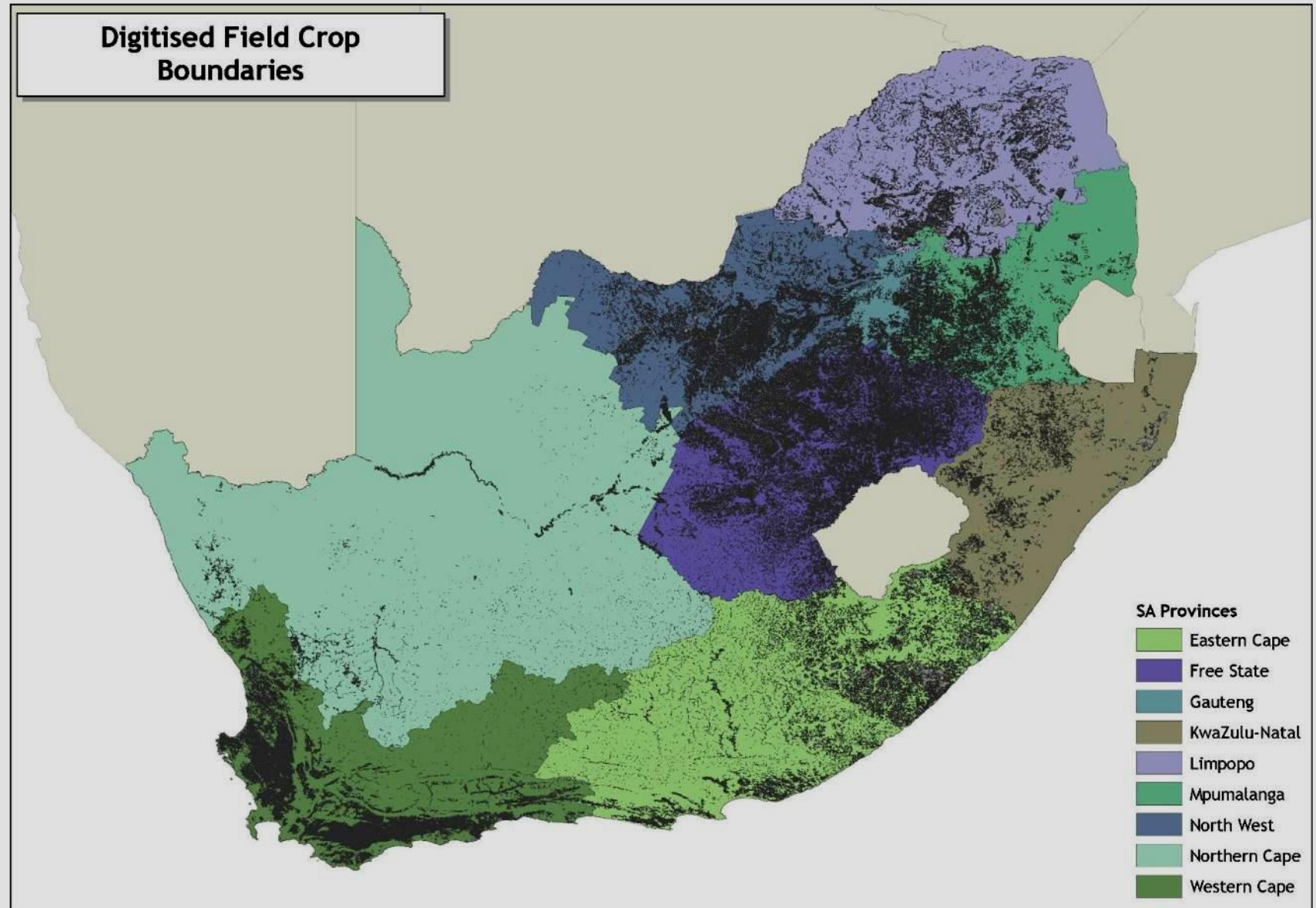
Summer Maize Sequence

- Area planted x Yield = Production
 - Maize: 3 M ha x 4 ton/ha = 12 M tons.....14 M tons
- Mapping update of Field Boundaries
 - Before November: Satellite imagery: Spot 5
- PICES Survey
 - February & March – Aerial Survey
- Intentions to plant & Actual Harvested
 - Oct / Nov – Telephonic survey
- Objective Yield Measurement
 - May – Field Visits
- Crop Type Classification: July 2013 –May 2014

Stratification: Mapped Fields

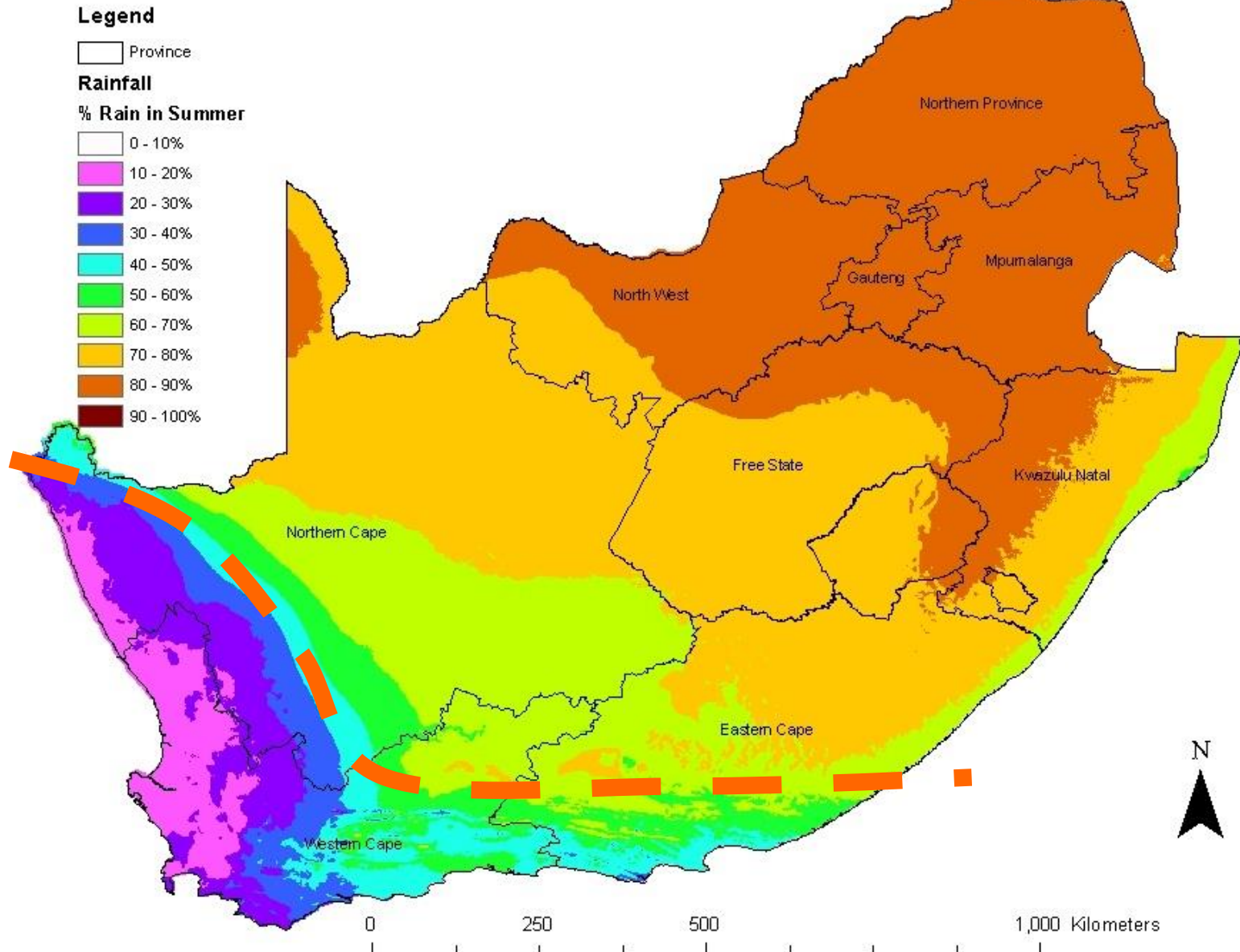


SA coverage: 14 million ha



Rainfall

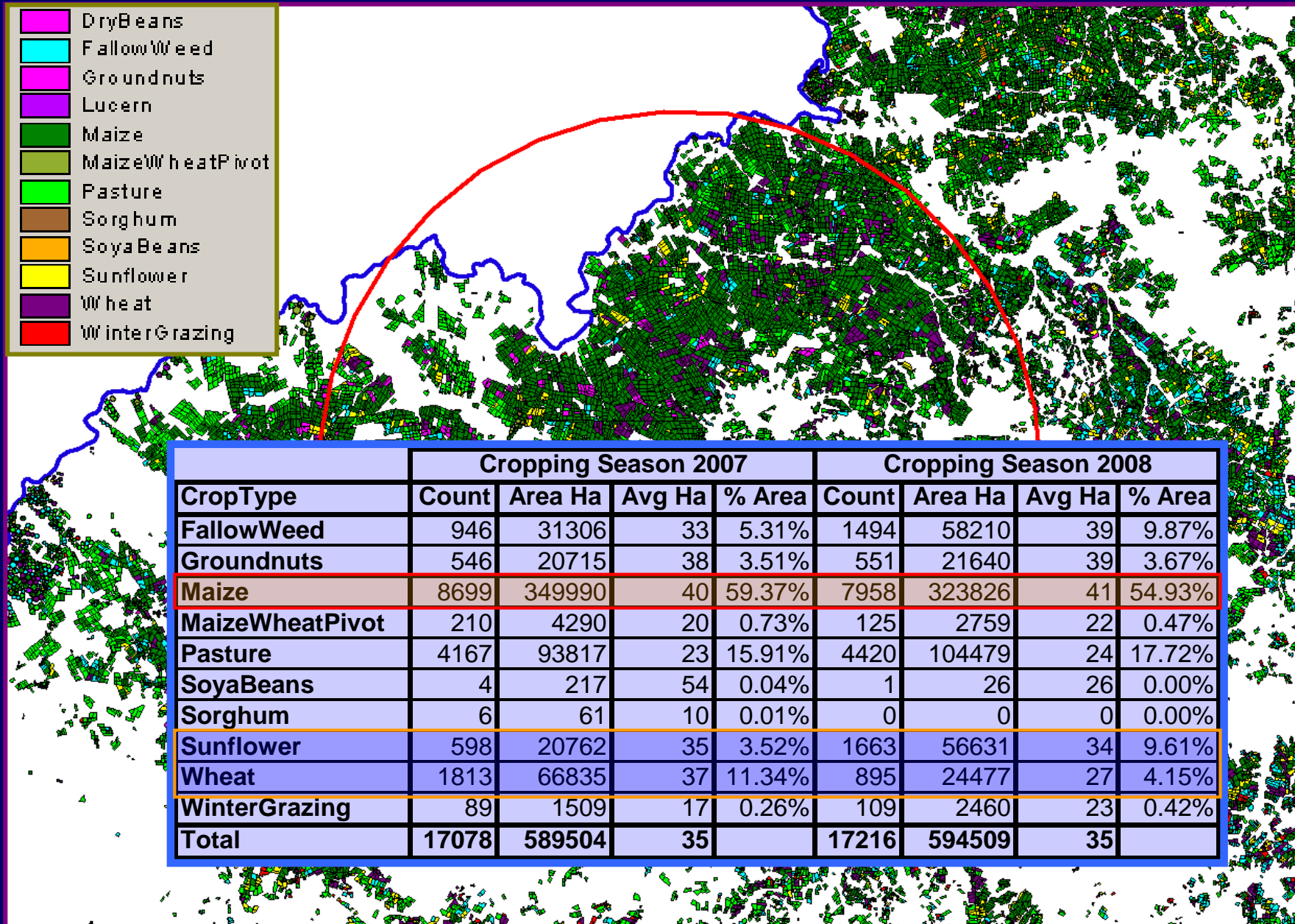
Rainfall Seasonality



Crop Calendar

Crop Calendar	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Maize: Early & Long	Senescence	Senescence	Senescence	Senescence	Growth	Growth	Growth	Growth	Growth	Growth	Dry Matter	Dry Matter
Maize: Late & Short	Senescence	Senescence	Senescence	Senescence	Senescence	Growth	Growth	Growth	Growth	Growth	Dry Matter	Dry Matter
Sunflower: Early	Senescence	Senescence	Senescence	Senescence	Growth	Growth	Growth	Senescence	Senescence	Senescence	Senescence	Senescence
Sunflower: Late	Senescence	Senescence	Senescence	Senescence	Senescence	Senescence	Growth	Growth	Growth	Senescence	Senescence	Senescence
Soya/Dry Beans	Senescence	Senescence	Senescence	Senescence	Growth	Growth	Growth	Growth	Senescence	Senescence	Senescence	Senescence
Pasture: Natural Grass	Fallow	Fallow	Fallow	Growth	Growth	Growth	Growth	Growth	Growth	Fallow	Fallow	Fallow
Wheat	Growth	Growth	Growth	Growth	Growth	Growth	Senescence	Senescence	Senescence	Senescence	Senescence	Senescence
Growth Stage Legend	Senescence		Fallow	Fallow		Dry Matter	Dry Matter		Growth	Growth		Growth

Western Freestate

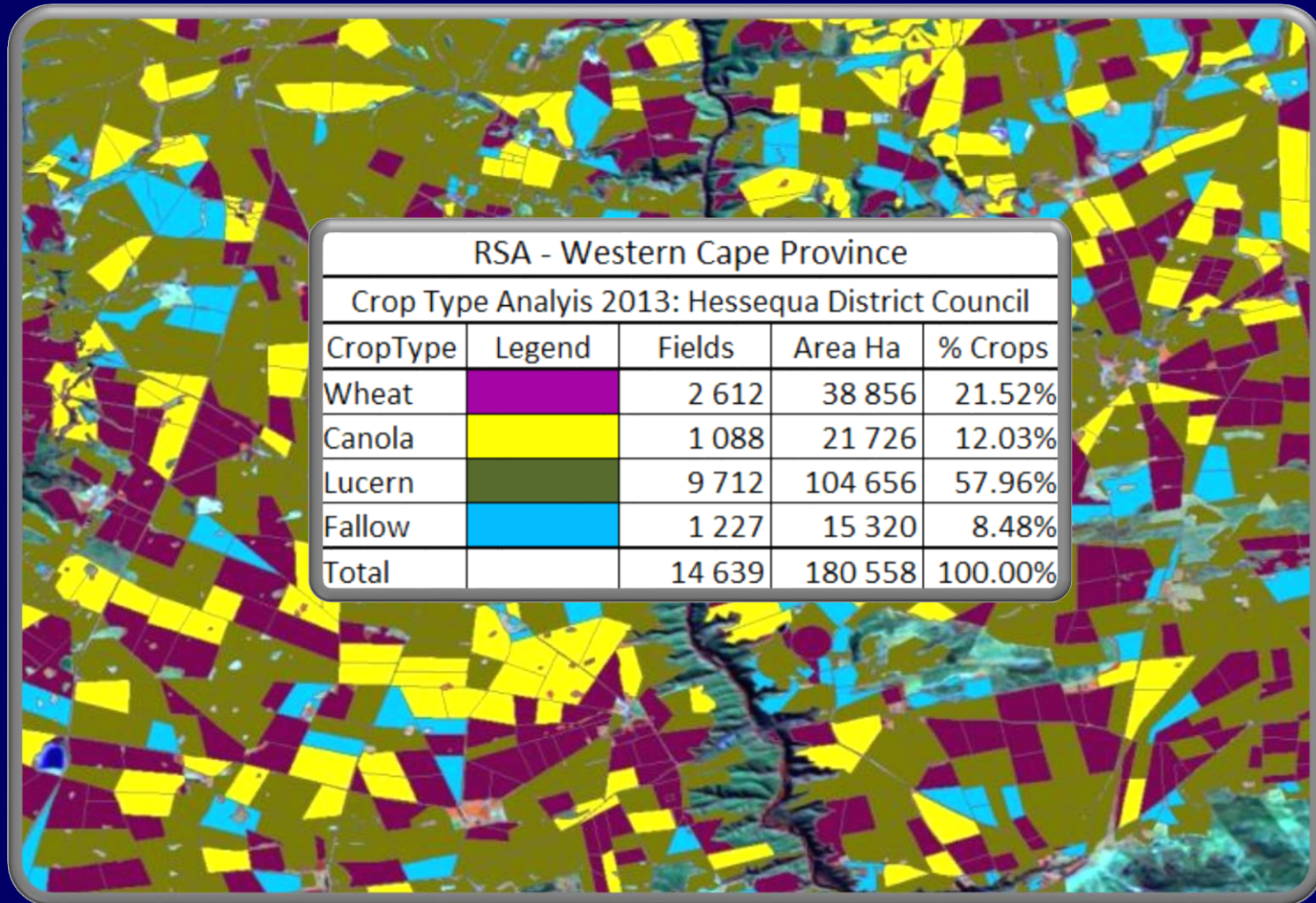


Crop Type Summary

FreeState District CropType Breakdown Summer 2007: Area Planted (Hectares)										
District	Fallow	Groundnuts	Maize	Pasture	Sorghum	SoyaBeans	Sunflower	Wheat06	Oats06	MaizeWheat
Bethlehem	21281	0	50459	23068	0	4965	1884	29990	2236	0
Bethulie	0	0	30	419	0	0	0	53	66	258
Bloemfontein	19773	4	19269	35342	76	0	7857	37320	3758	1678
Boshof	16396	629	42740	53036	0	0	9560	10728	3920	1412
Bothaville	5717	1776	107436	49582	618	423	6921	10034	407	466
Botshabelo	0	0	0	49	0	0	0	0	0	0
Brandfort	9254	0	13327	50403	235	0	6351	9393	3507	357
Bultfontein	9020	3977	66462	15834	17	99	4051	18626	627	1352
Clocolan	7067	0	17358	10663	0	67	934	13336	2230	0
Dewetsdorp	5161	0	789	18808	60	0	751	3627	5110	155
Edenburg	10	0	74	136	0	0	18	64	398	128
Excelsior	12845	0	14326	23972	232	0	2486	8017	3430	48
Fauresmith	253	0	4026	3069	0	0	272	1122	789	3338
Ficksburg	5244	0	14025	13204	0	307	636	7980	2334	59
Fouriesburg	1938	0	8243	3884	3	167	102	6753	832	2
Frankfort	13065	20	44757	52252	1538	7363	547	7496	1953	1065
Harrismith	23194	0	51139	38887	0	18410	1577	24794	6029	0
Heilbron	15698	0	27036	69916	17583	357	3691	3569	1622	106
Hennenman	6657	67	16945	12584	19	21	3544	4188	398	14
Hoopstad	12984	12160	127158	42469	0	23	7280	18703	191	1590
Jacobsdal	837	0	4312	5431	0	0	188	1458	67	5021
Jagersfontein	0	0	25	136	0	0	34	51	57	59
Koffiefontein	873	0	1789	6394	0	0	133	2742	985	1495
Koppies	10964	279	25943	21425	9582	201	4740	417	532	46
Kroonstad	21060	470	56164	64359	605	194	11774	8205	779	48
Ladybrand	11376	0	11642	18816	13	17	795	10184	2504	0
Lindley	18657	0	22095	38599	167	327	3566	15265	1555	0
Marquard	8386	21	21880	13314	0	0	3019	7306	1533	0
Odendaalsrus	1812	375	24255	9508	2	49	1175	4939	207	0

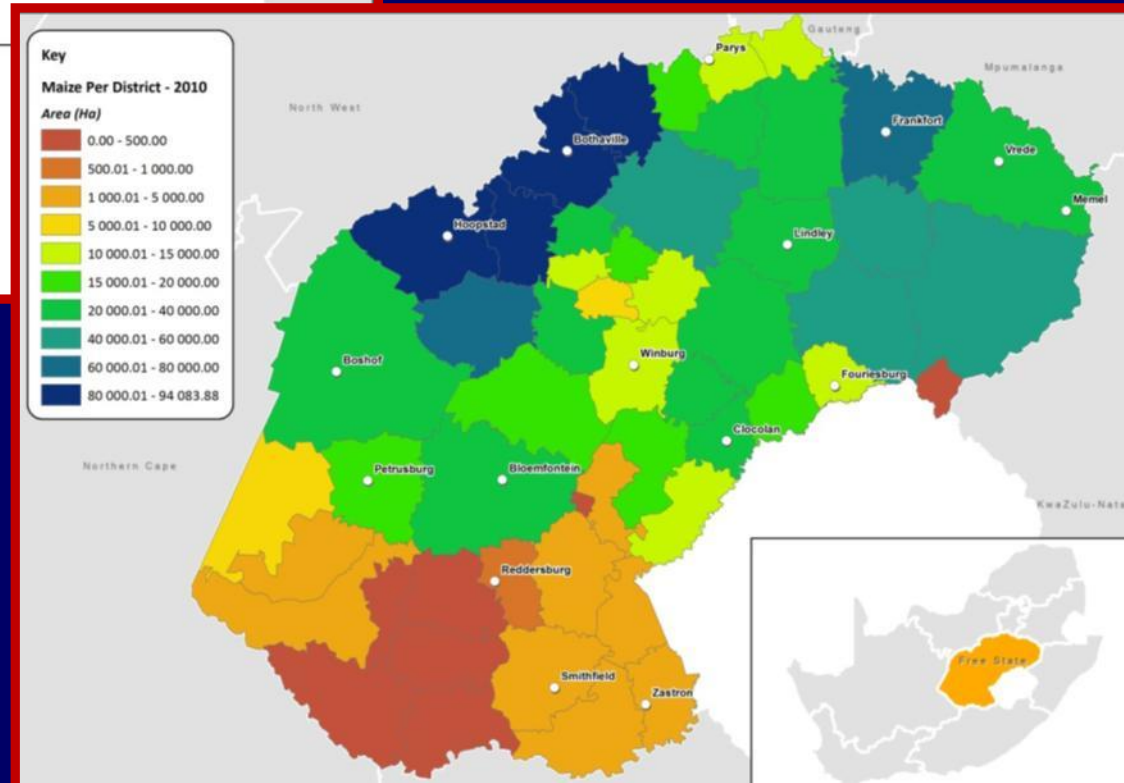
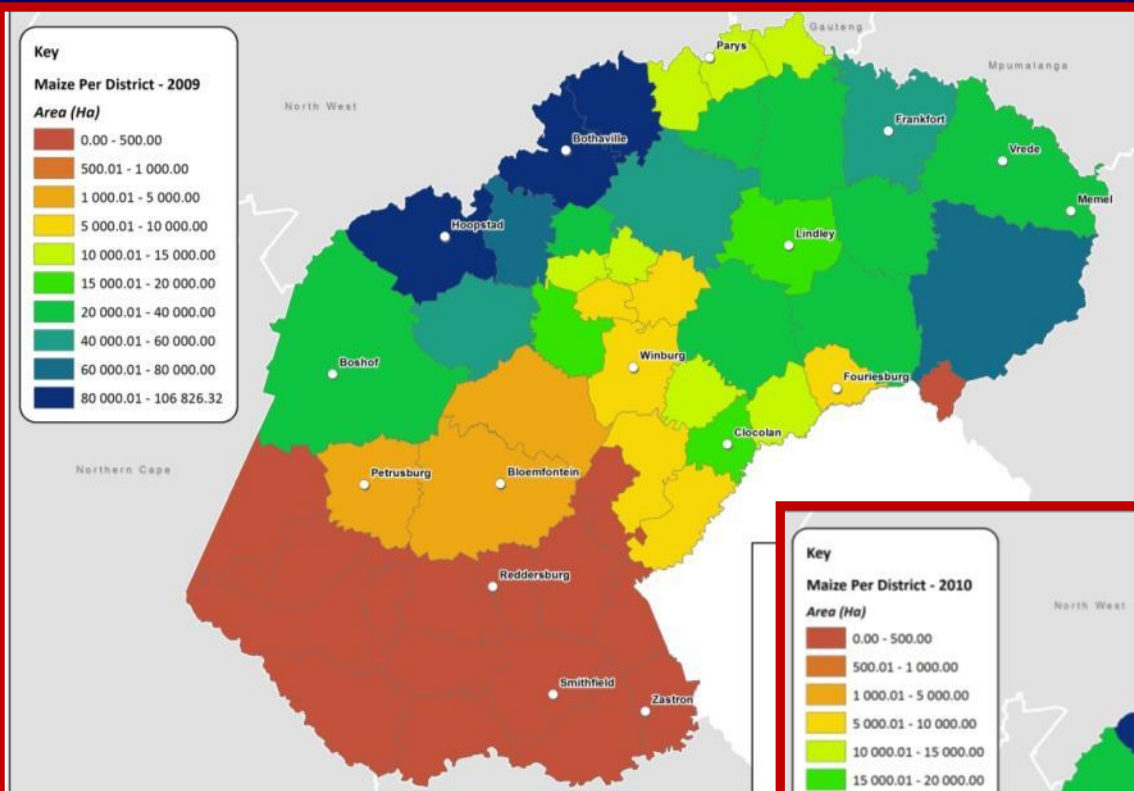
Canola: Hessequa District

Field mapping and Crop typing



Maize Comparison: 2009 vs 2010

- Spatial Distribution
- Cultivated area
- Crop types



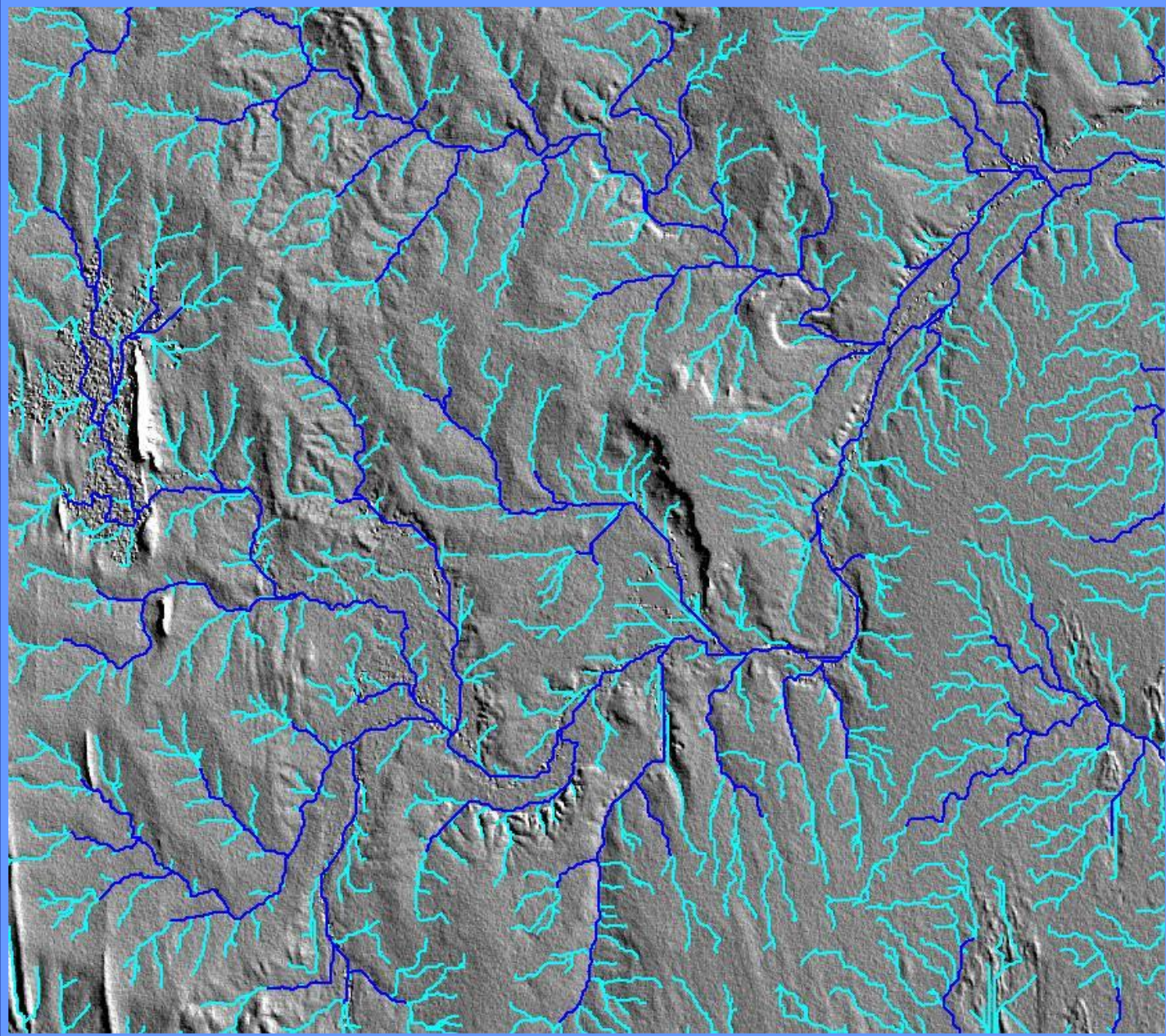
District level comparison:
✓ Maize area / district

Terrain Analysis

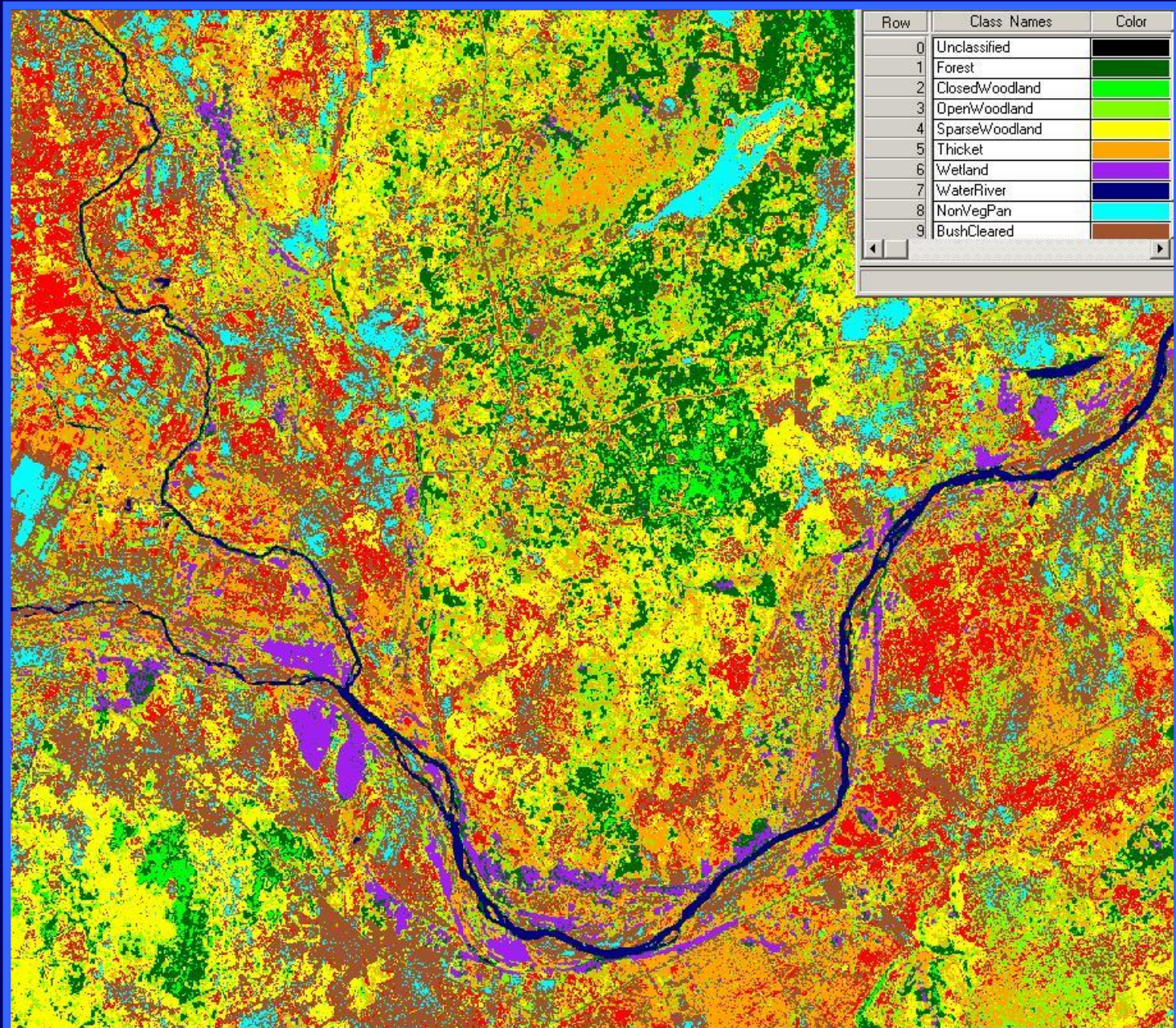
- New Agricultural Developments in Africa

- Planning and Stratification
 - Soil Survey
 - Landscape evaluation
- Eliminate unsuitable terrain & soil types
 - Pans/shallow or steep soils/flooded areas...etc
- Stratify suitable terrain into homogenous potential zones
 - Soil survey target homogenous potential zones
- Select most suitable landscapes
 - Subdivide suitable areas into management zones according to
 - Cultivation practices
 - Harvesting practices & Mechanisation

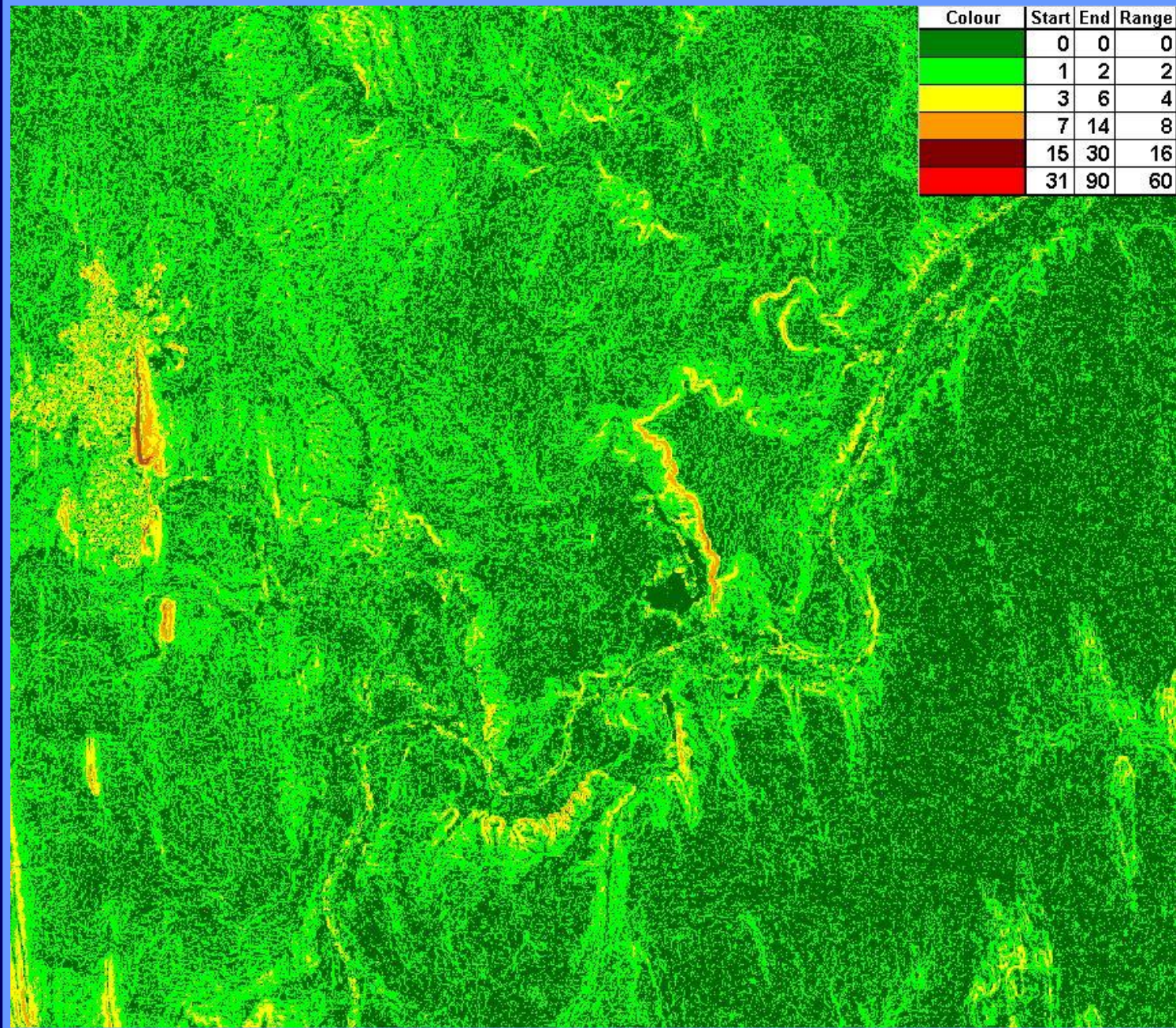
Terrain Analysis: Streamlines



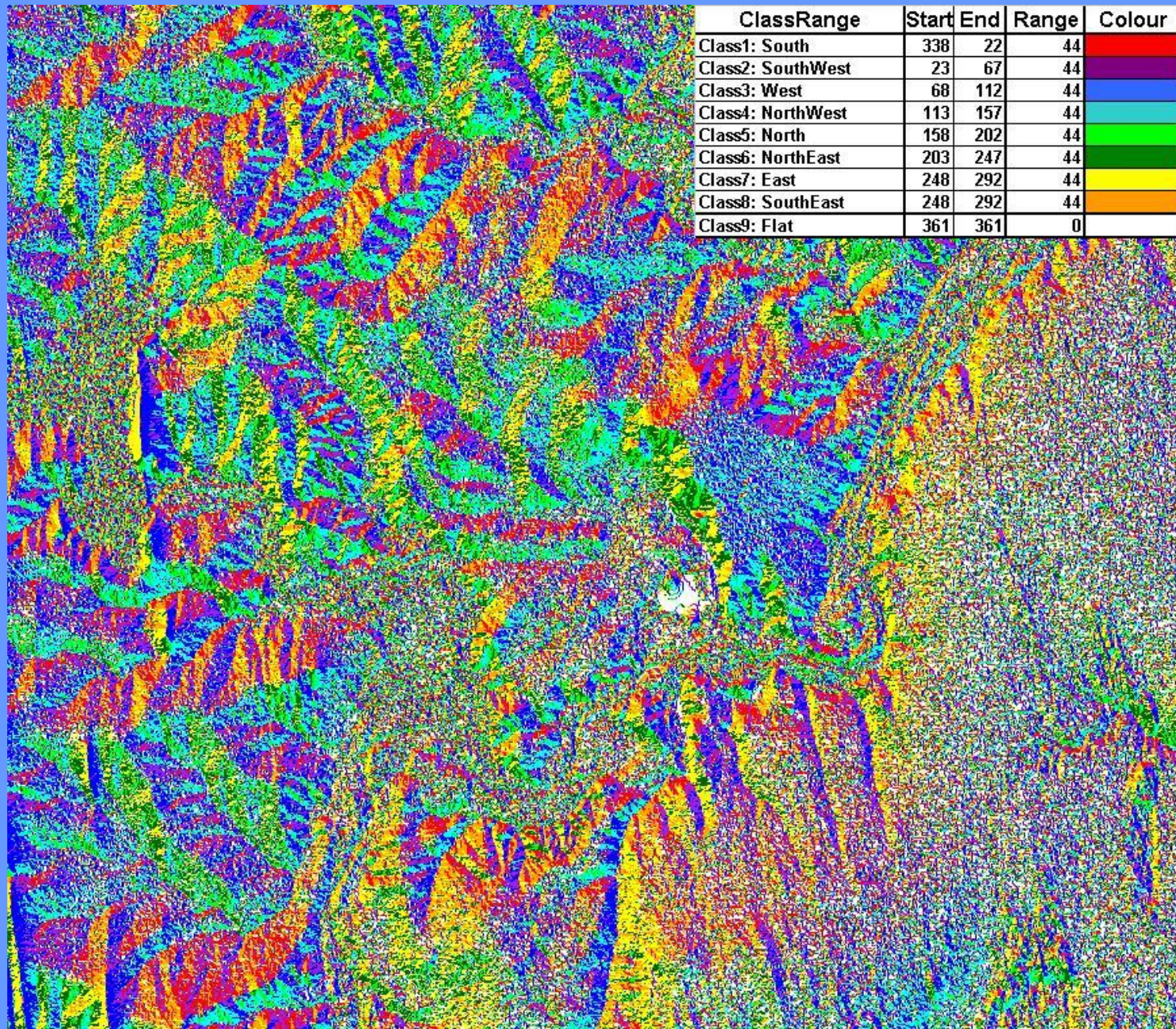
Terrain Analysis: Natural Vegetation



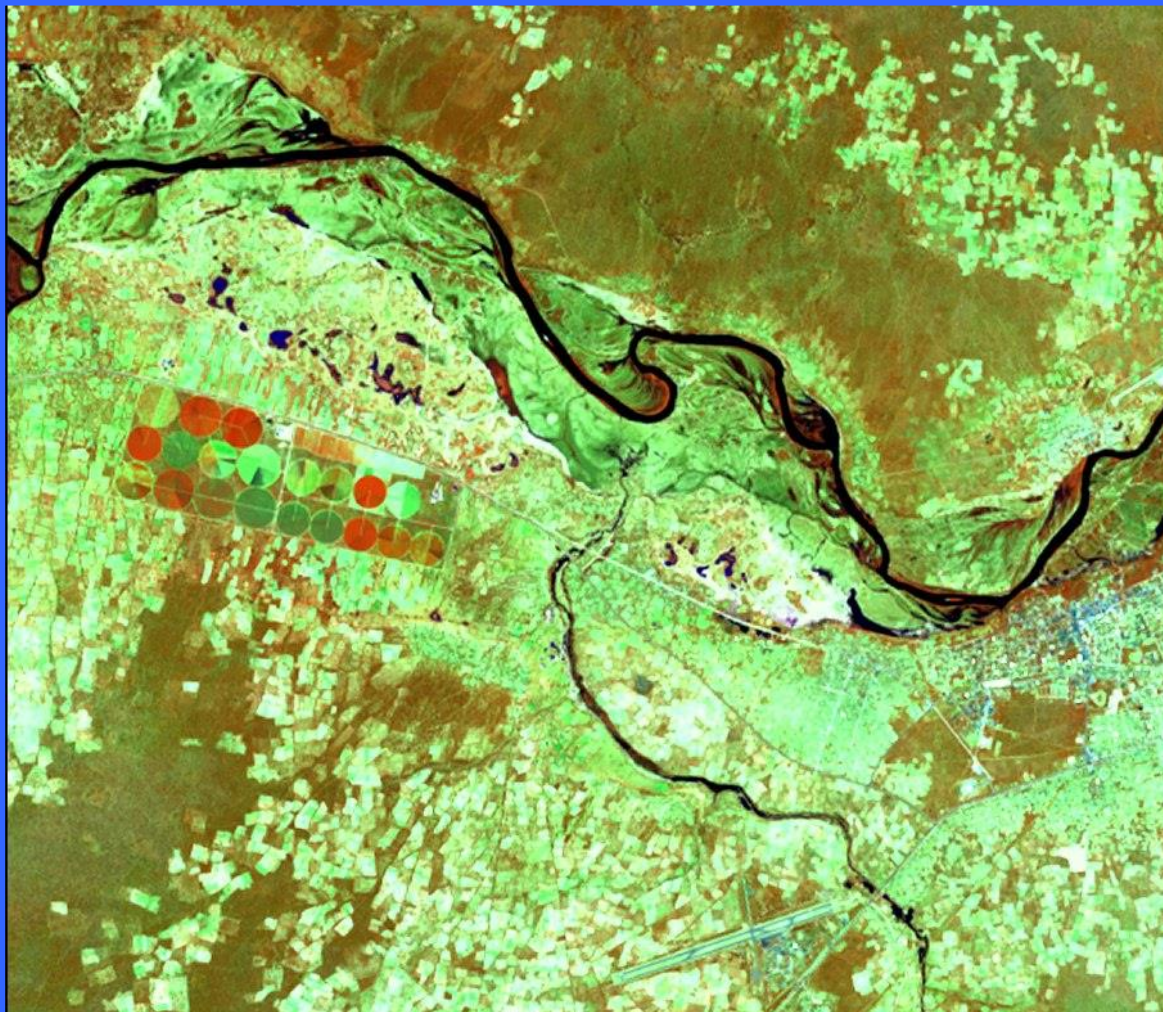
Terrain Analysis: Slope Map



Terrain Analysis: Aspect Ranges



Caprivi: Rundu 15 km radius



FID	Shape	CATNAME	AREAHA
1871	Polygon	Pivot	29.7
1871	Polygon	Pivot	30.62
1872	Polygon	Pivot	32.31
1872	Polygon	Pivot	96.15
1872	Polygon	Pivot	32.71
1872	Polygon	Pivot	32.17
1872	Polygon	Pivot	30.27
1879	Polygon	Pivot	68.85
1891	Polygon	Pivot	39.91
1914	Polygon	Pivot	27.72
1914	Polygon	Pivot	28.62
1914	Polygon	Pivot	26.93
1920	Polygon	Pivot	10.83
1920	Polygon	Pivot	11.11
1921	Polygon	Pivot	11.43
1921	Polygon	Pivot	22.41
1921	Polygon	Pivot	2.75
1921	Polygon	Pivot	2.22
1922	Polygon	Pivot	53.77
1923	Polygon	Pivot	13.03
1923	Polygon	Pivot	30.68
1923	Polygon	Pivot	7.76

27Sept2013 / 17Jan2014 / 20 Feb2014

Enumerator Areas

- **Statistics South Africa**
 - Population Census Framework
 - South Africa completely covered
 - Approximately 200 Households per EA
 - Known reporting framework
 - Demographics
 - Income groups
 - Summary of Additional Information
 - Land Cover and Land Use activity
 - Agricultural activity



Business Decision Making

Demographics

MALE	364.211018
FEMALE	377.21743
BLACK	741.428447
COLOURED	0
ASIAN	0
WHITE	0
OTHER	0
AGE0_4	48.908976
AGE5_9	46.85209
AGE10_14	39.931791
AGE15_19	66.295828
AGE20_24	87.081961
AGE25_29	57.813926
AGE30_34	38.897565
AGE35_39	70.17158
AGE40_44	60.681571
AGE45_49	41.139315
AGE50_54	28.944364
AGE55_59	26.406726
AGE60_64	26.145316
AGE65_69	25.830203
AGE70_74	29.818376
AGE75_79	24.693341
AGE80_84	19.003812
AGE85_	2.811707



AFRIKAANS	4
ENGLISH	45
ISINDEBELE	4
ISIXHOSA	13
ISIZULU	29
SEPEDI	7
SESOTHO	9
SETSWANA	622
SIGN_LANGU	3
SISWATI	0
TSHIVENDA	0
XITSONGA	6
LANG_OTH	0
LANG_UNSP	0
LANG_NOTAP	0



Business Decision Making

LSM (Living standard measure)



EA_CODE	79911356
LSM1	0
LSM2	0
LSM3	0
LSM4	0
LSM5	8.87
LSM6	26.34
LSM7	13.25
LSM8	14.08
LSM9	24.37
LSM10	95.09
TOT_HH11	182
PER_LSM1	0
PER_LSM2	0
PER_LSM3	0
PER_LSM4	0
PER_LSM5	4.88
PER_LSM6	14.47
PER_LSM7	7.28
PER_LSM8	7.74
PER_LSM9	13.39
PER_LSM10	52.25
DOM_LSM	10

Business Decision Making

Agricultural Activity



Summary

- Cultivated fields
 - Individual size
 - Location and extent
- New developments in Africa
 - Terrain analysis
 - Proximity to infra structure
- Population Distribution
 - Demographic Breakdown
 - Customer distribution
 - Client density & segmentation



GEOTERRA
IMAGE

Unleashing
the **power of imagery**
improving your
business intelligence

Thank you

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