rural development
& land reform
Department:
Rural Development and Land Reform
REPUBLIC OF SOUTH AFRICA

# *Growth Trends Analysis*

## *National overview on key indicators*

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Gerbrand Mans
Mawande Ngidi
Pierre du Plessis

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# **Why** is it important

- Historically no freedom of choice i.t.o. where to live
- SA did not follow a “conventional” pattern where people settle close to jobs and/or other opportunities

Implication: unique system of people and place dynamics in constant flux for the past 15+ years

- In order to do proper spatial planning (full spectrum) we need to understand this complex system

# **What** are we looking at

- Foundation is:
  - Who is moving
  - Where (spatial)
  - Why
  - When (temporal analysis)

- Shows implications on specific place
  - Growth = pressure on ranges of services (publ. & priv.); as well as land; the latter needs proper planning
  - Decline = shift in resources

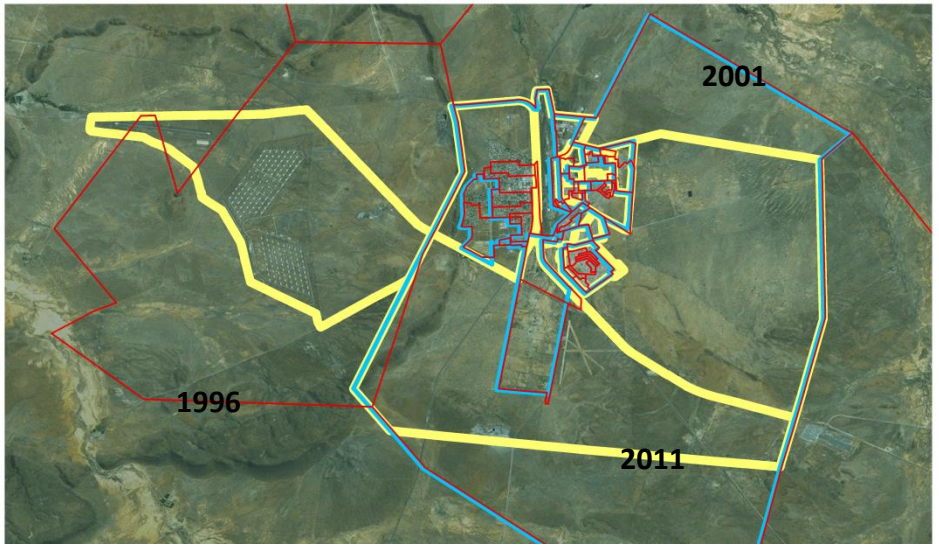
# What (cont.)

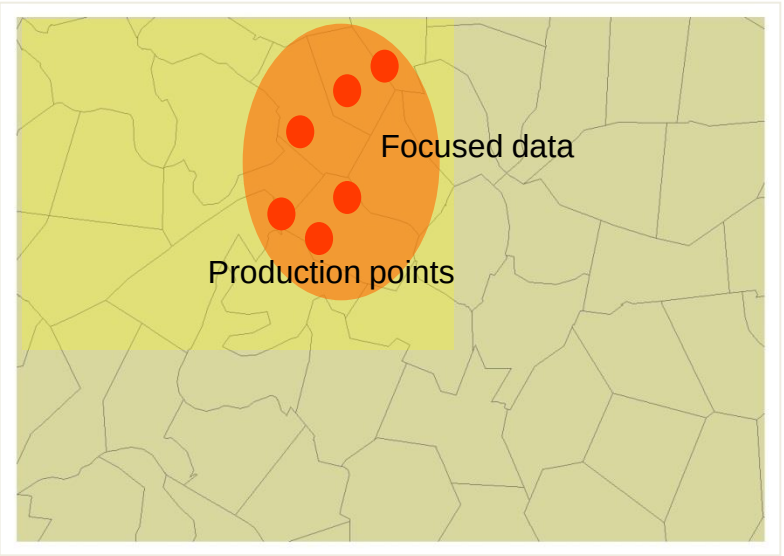
- This study focus on selected variables to demonstrate & evaluate:
  - Capability
  - Data / institutional arrangements
  - Cost
  - To judge viability
- Variables selected (main drivers of spatial change)
  - Total population 1996; 2001; 2011
  - Age cohort analysis: 1996 - 2011
  - Households (poor): 1996 - 2011

[*How do we get the answer from this data?*]

# **How** do we prepare the data

- Data not spatially aligned
- Algorithm developed to align data
  - Dasymetric mapping principles
  - Ancillary data to do re-allocation
    - Spot Building Count (SBC)




**Input**

$m =$ number of wards.
$m' =$ number of mesozones.
$n =$ number of points (houses).
Let $T = \{t_i, \dots, t_m\}$ be the set of population totals per ward.

Let $P = \{p_i, \dots, p_n\}$ be the potential household size of each point.

**Process step 1**

Let $\Lambda = \{W_i\}_{i=1}^{m}$: $\cup_{i=1}^{m} W_i = P$ be a partition of $P$ into $m$ wards. Let $w_{ij}$ refer to the $j^{th}$ point of ward $i$.

$S = \{s_i : s_i = \sum w_{ij} \; \forall \, w_{ij} \, \epsilon \, W_i \}_{i=1}^{m}$.

$\Lambda' = \{W'_i\}_{i=1}^{m}$ with $W'_i = \{w'_{ij} : w'_{ij} = w_{ij}/s_i \; \forall \, w_{ij} \, \epsilon \, W_i\}$.

$\hat{P} = \{ \hat{p}_k : \hat{p}_k = w'_{ij} \times t_j \; \forall \, w'_{ij} \, \epsilon \, W'_i \}_{i=1}^{m}$.

**Process step 2**

Let $\Theta = \{M_i\}_{i=1}^{m'}$: $\cup_{i=1}^{m'} M_i = \hat{P}$ be a partition of $\hat{P}$ into $m'$ mesozones. Let $m_{ij}$ refer to the $j^{th}$ point of mesozone $i$.

$\hat{S} = \{\hat{s}_i : \hat{s}_i = \sum m_{ij} \; \forall \, m_{ij} \, \epsilon \, M_i \}_{i=1}^{m'}$.

# Benefit

- All data assigned to same demarcation
- Used mesozones **=>** align to admin boundaries
- Time series data scalable according to current admin boundaries
- Result:
  - Comparable (compensates for boundary changes)
  - Accurate time series data

# Explanation

- Population data (gender split)
- Age cohort analysis (3 cohorts of working age population)

| Cohort | 1996 | 2011 |
|---|---|---|
| A | 00-14 years old | 15-29 years old |
| B | 15-29 years old | 30-44 years old |
| C | 30-44 years old | 45-59 years old |

Only way a cohort can:
- grow is through in-migration
- decline is though out-migration or deaths

- Poor households (binary classification)

**Income levels and household classification defined by the BMR were:**
- Poor (R0 - R54 344 income per annum)
- Low emerging middle class (R54 345-R151 727 income per annum)
- Emerging middle class (R151 728-R363 930 income per annum)
- Realised middle class (R363 931-R631 120 income per annum)
- Upper middle class (R631 121-R863 906 income per annum)
- Emerging affluent (R863 907-R1 329 844 income per annum)
- Affluent (R1 329 845+ income per annum)

(UNISA, 2013)

Income bands were adjusted using CPI to align data temporally

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# Analysis & results

Moving from data to relevant indicators:

- Change in absolute values

VS

- Exponential growth rate (growth per year)

VS

- Relative strength of spatial agglomeration and diffusion patterns (relative to national average)

https://ms-gis.csir.co.za/flexviewers/LUMT_Prov/

https://ms-gis.csir.co.za/flexviewers/LUMT_DM/

https://ms-gis.csir.co.za/flexviewers/LUMT_LM/

https://ms-gis.csir.co.za/flexviewers/LUMT_Meso/

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# Results

## Population

https://ms-gis.csir.co.za/flexviewers/lumt_growthtrend_males/
https://ms-gis.csir.co.za/flexviewers/lumt_growthtrend_females/
https://ms-gis.csir.co.za/flexviewers/lumt_growthtrend_population/

## Age cohort (working age)

https://ms-gis.csir.co.za/flexviewers/lumt_growthtrend_15T29yrs/
https://ms-gis.csir.co.za/flexviewers/lumt_growthtrend_30T44yrs/
https://ms-gis.csir.co.za/flexviewers/lumt_growthtrend_45T59yrs/

## Poor households

https://ms-gis.csir.co.za/flexviewers/lumt_growthtrend_poor_hh/

# Thank you

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