DRAFT NATIONAL SPATIAL DEVELOPMENT FRAMEWORK

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ACKNOWLEDGEMENT

This Draft National Spatial Development Framework is the first of its kind to be compiled in South Africa. Prepared in accordance with the provisions of the Spatial Planning and Land Use Management Act, 2013, this was done in a consultative and collaborative way.

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ABBREVIATIONS AND ACRONYMS

BEPP	Built Environment Performance Plan
CBA	Critical Biodiversity Area
CBO	Community-Based Organisation
CEF	Capital Expenditure Framework
CoGTA	Departments of Cooperative Governance and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
CSP	Cities Support Programme
DAFF	Department of Agriculture Forestry and Fisheries
DHS	Department of Human Settlements
DMR	Department of Mineral Resources
DoE	Department of Energy
DORA	Division of Revenue Act
DoT	Department of Transport
DPME	Department of Planning, Monitoring and Evaluation
DRDLR	Department of Rural Development and Land Reform
DWS	Department of Water and Sanitation
ESA	Ecological Support Area
GVA	Gross Value Added
HDA	Housing Development Agency
HSMSP	Human Settlements Master Spatial Plan
ICT	Information and Communication Technologies
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
IGRFA	Intergovernmental Relations Framework Act, 2005
IGR	Intergovernmental Relations
ITMP	Integrated Transport Master Plan
IUDF	Integrated Urban Development Framework
LUMS	Land Use Management System
M&E	Monitoring and Evaluation
MEC	Member of the Executive Council
MFMA	Municipal Finance Management Act, 2003
MIIF	Municipal Infrastructure Investment Framework

MinMec	Ministers' and MECs' Forum
MSA	Municipal Systems Act, 2000
MSDF	Municipal Spatial Development Framework
MSP	Master Spatial Plan
MTSF	Medium Term Strategic Framework
NATMAP	National Transport Master Plan 2050
NDoT	National Department of Transport
NDP	National Development Plan 2030
NGO	Non-Governmental Organisation
NGP	New Growth Path
NIP	National Infrastructure Plan
NPC	National Planning Commission
NPO	Non-Profit Organisation
NSAA	National Spatial Action Area
NSDF	National Spatial Development Framework
NSDP	National Spatial Development Perspective
NT	National Treasury
NTP	National Transport Plan
PFMA	Public Finance Management Act, 1999
PICC	Presidential Infrastructure Coordination Committee
PGDS	Provincial Growth and Development Strategy
PGM	Platinum Group Metals
PLTF	Provincial Land Transport Framework
PRASA	Passenger Rail Agency of South Africa
PSDF	Provincial Spatial Development Framework
RDP	Reconstruction and Development Programme
RSDF	Regional Spatial Development Framework
SACN	South African Cities Network
SADC	Southern African Development Community
SALGA	South African Local Government Association
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency SOC Ltd
SDF	Spatial Development Framework
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SEIAS	Socio-Economic Impact Assessment System

SEZ	Special Economic Zone
SIP	Strategic Infrastructure Programme
SKA	Square Kilometre Array
SPLUMA	Spatial Planning and Land-Use Management Act, 2013
SOE	State-Owned Enterprise
StepSA	Spatial and Temporal Evidence Platform for SA
SWSA	Strategic Water Source Area
TOD	Transit-Oriented Development
TWG	Technical Working Group

GLOSSARY OF TERMS

Apartheid

A political system and its laws and policies directed towards the separation of different ethnic or racial groups. Spatially, apartheid involved the physical separation of the four racial groups according to the Population Registration Act of 1950 into so-called "Group Areas" according to the Group Areas Act of 1950. A system of ethnically-based "Bantustans" for Black South Africans was also established.

Bantustan

Areas reserved for African occupation under the Apartheid government. Approximately13% of the total area of South Africa was divided into ten such Bantustans and were given some degree of self-rule, but always subject to the wishes and needs of the Apartheid government. While these areas were incorporated back into South Africa at the dawn of democracy in 1994, they still suffer the consequences of long-term neglect, isolation and poverty.

Critical Biodiversity Areas and Ecological Support Areas

Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), are natural areas of critical importance for ecological sustainability, and should be kept in their natural, or at least semi-natural, state. Critical Biodiversity Areas (CBAs) are divided into two sub-categories: CBA1 and CBA2. CBA1s are irreplaceable, which means that there are no other places in the landscape where the conservation and ecological objectives associated with those CBAs can be met. In CBA2s, there may be some options for meeting the conservation and ecological objectives associated with those CBAs in other parts of the landscape. However, this can only be done at the cost of losing some of the spatial efficiency of the network of CBAs. If a CBA2 is lost and an alternative natural area elsewhere is identified to become part of the CBA network, the alternative area is likely to be larger, increasing the size of the CBA-network as a whole. Areas identified as ESAs should be kept in at least semi-natural condition, i.e. with their basic ecological functioning still intact.

City

A human settlement characterised by (1) large and generally diverse communities of people living at high residential densities, (2) a variety of employment opportunities, and (3) high-intensity business and commercial areas.

Concentration

Concentration of people and activities refers to (1) a higher density of people, and (2) a higher intensity and mix of activities in a specific place, area or region. Generally, such concentration supports the development and sustenance of *agglomeration economies*. This can take the form of *urbanisation economies* (where cost decreases as total output of an urban area increases) or *localisation economies* (where costs decrease as firms in a specific industry increase output).

Decentralisation

The flow of people and economic activities from an urban centre or node to outlying (suburban and/or peri-urban) areas or nodes.

Densification

The process of increasing the number of people living in a specific area to ensure that (1) better use is made of movement infrastructure, services, ICT networks and amenities by a greater number of people, and (2) the need for expansion of existing grids, networks and services is reduced.

Development Corridor

Integrated linear networks of infrastructure and economic activity. Development corridors typically fulfil a variety of multiple, complex functions, such as (1) the movement of people and freight, (2) facilitating trade between areas, (3) flows of information, (4) flows of services such as water and gas, and (5) facilitating tourism. Supportive functions may be located in corridors, e.g. logistics. Development corridors often also include a human settlement and/or economic activity component, e.g. higher-density transit-oriented mixed-use development or industrial development adjacent to, or along the main transport routes.

Diversification

The process of introducing and/or allowing a greater mix of land uses in an area, to (1) boost local people-to-people service economies, stimulate co-production of knowledge innovation and create jobs, (2) reduce the need for travel and travel distances, (3) bring more vibrancy and life to an area; (4) enhance social interaction and cohesion, and (5) make better use of available land.

Ecological Footprint

A measure of the 'load' imposed by a given population on natural systems. The bigger the footprint, the greater the impact.

Ecological Infrastructure

Ecological infrastructure refers to naturally functioning ecosystems that generate or deliver valuable services to people, e.g. water catchments, wetlands, riparian zones, coastal dunes, kelp beds or spawning grounds. Ecological infrastructure consists of a network of interconnected structural elements in the landscape and seascape.

Economic Sectors

A description of the kind of economic activities in a country, or the activities in which the population of a country are active/working. The following *five* categories/sectors of economic activity are generally used in this regard: (1) the *primary sector,* which includes agriculture, mining and other natural resource-based industries; (2) the *secondary sector,* which entails manufacturing, engineering and construction; (3) the *tertiary sector,* meaning the service industries; (4) the *quaternary sector,* which refers to intellectual activities involving education and research; and (5) the *quinary sector,* which is reserved for the economic activities of high-level decision makers in government and industry.[i] In some instances, including this NSDF, the last two sectors are included in the definition of the *tertiary sector*.

Ecosystem

The dynamic and complex interplay of animal, plant, and micro-organism communities and their non-living environment (soil, water, climate and atmosphere) as a functional unit.

Ecosystem Services

The beneficial services that nature provide to people. Ecosystem services are typically grouped into four broad categories: (1) *provisioning,* including the production of food and water; (2) *regulating,* including the control of climate and disease; (3) *supporting,* including nutrient cycles and oxygen production; and (4) *cultural,* including spiritual and recreational benefits.

Evidence Mapping

A structured process of seeking, ordering and making sense of relevant published and unpublished research (i.e. 'evidence') to inform the preparation and review of policy and legislation.

Food Security

A condition of having reliable access to a sufficient quantity of affordable and nutritious food, through locally-grown produce and/or imports.

Hinterland

The sparsely populated areas close to an urban settlement or node in which people farm or depend on natural resources for their livelihood, including the villages and small towns that are dispersed throughout these areas.

Human Settlement

A place where people live, work, study and relax. A settlement can range in size from a small number of dwellings grouped together to a large city or groups/conglomerations of cities tied together through dense transport and communication networks.

Infrastructure

The basic equipment, utilities, productive enterprises, installations, and services essential for the development, operation, and growth of human settlements and economic activities. Infrastructure includes items such as roads, utility lines for water, sanitation and electricity, drainage structures and communication technology. A distinction is often made between (1) *engineering infrastructure,* such as roads, electricity, sewerage, water, and (2) *social infrastructure,* which can broadly be defined as the construction and maintenance of facilities that support social services, such as health, education, community, welfare support, citizen registration and cultural facilities.

Land-Use Pattern

The land-use pattern is a general description of how land is occupied or used, and how land-uses tend to be distributed across a specific geographic area. In the context of the NSDF, the *national land-use pattern* is a high-level description of how the (1) population, (2) settlements, (3) economic activities, and (4) natural areas are distributed and systemically-related within the country as a whole.

Land Reform

The process of correcting the historical imbalances in (1) *ownership* of land, and (2) *access* to land. It entails three types of intervention by the State, *viz.* (1) *land restitution,* meaning the redress of wrongs committed during the colonial and Apartheid eras; (2) *land redistribution,* meaning the provision of land for residential and economic purposes to those who do not have the means to access land); and (3) *tenure reform,* meaning the provision of security of tenure.

National Development Paradigm

The overarching set of ideas and beliefs and its associated legal and policy framework, setting out how (1) a country should be developed, (2) its economic relations should be structured, (3) the benefits of its economic system should be shared, and (4) its natural resources should be used and managed.

National Social and Economic Interactions

The dense network of social and economic activities that take place in a country.

National Spatial Development Framework

A long-term national spatial planning instrument with a long-term horizon that (1) is mandated by the Spatial Planning and Land Use Management Act, 2013 (SPLUMA), (2) has to be aligned with the National Development Plan (NDP), and (3) is adopted by Cabinet as official national spatial development policy for implementation throughout the country. As such,

it provides (1) an overarching spatial development framework including a set of principle-driven spatial investment and development directives for all three spheres and sectors of government, meaning 'where, when, what type, and how much to invest and spend throughout the country'; and (2) a set of strategic spatial areas of national importance from an ecological, social, economic and/or ICT or movement infrastructure perspective, to be targeted by both government and the private sector in the pursuit of strategic national development objectives, or to avert national crises.

National Spatial Development Logic

The approach to, and the way in which national space is used and managed in pursuit of the objectives of the prevailing *national development paradigm*.

National Spatial Development Pattern

The outcomes of the *national spatial development logic* of a country in national space. As such, it entails (1) where, how and for whom settlements are built, (2) the land tenure types and land-use patterns in these settlements, and (3) the type, mix, density, intensity and distribution of land-uses in these settlements.

Natural Resource Foundation

The natural resources of a country, consisting of both ecosystem services and sensitive and important ecological systems. These resources need to be defined, mapped and protected, preferably by law, and their utilisation carefully managed for the benefit of the ecological system and the sustenance of future generations.

Node

Nodes are concentrations and clusters of activities of varying intensity and density, and can be either mixed-use or mono-functional (e.g. an office node).

Polycentric system

A functionally integrated system of settlements/nodes of varying size that co-exist and collaborate in mutually beneficial ways, and in doing so, enhance the resilience of the system and its constituent parts. The system allows the provision of a series of social and other services by (1) using the unique qualities of the various settlements/nodes in the system, and (2) harnessing the connections between them.

Protected Area

An area of special natural, ecological, architectural or historic interest that is protected by law. The protected areas referred to in this NSDF are those areas that are officially classified as such in terms of the National Environmental Management Act, 1998.

Rural

Generally regarded as areas outside cities and towns. Economic activity in these areas is in most cases intrinsically tied to natural resource use and/or beneficiation, and consists of agriculture, fishing, forestry, nature conservation, eco-tourism and mining. In South Africa, there are rural areas that are densely populated, but without (1) the distinct and diverse nodal areas of dense economic activity in the secondary and the tertiary sectors, or (2) the amenities typically associated with urban areas. These areas are a remnant of colonial and Apartheid spatial planning and the creation of Bantustans.

Rural Development

The process of improving the quality of life and economic well-being of people living in a rural area, by planned interventions in the area in (1) the ownership and use of land, (2) the provision, maintenance and upgrading of infrastructure and social services, and (3) the type and intensity of economic activities.

Rural Edge

A line that is used to delineate a systemically-integrated area/region that has distinct rural qualities that need to be protected from 'intruding' uses that may disrupt or destroy these qualities. Typically, the delineation would be accompanied by (1) a description of the kinds of activities that are permitted within the area/region, and (2) the procedures to apply for uses that are not specified as such. The line may have coordinates and be statutory, meaning it has binding legal power, or be seen as a soft or 'fuzzy line', meaning its exact coordinates are not defined, and it is to be used in a planning and policy sense and not as hard, impenetrable physical line.

Ruralisation

The process by which (1) people choose to remain in rural areas because there are viable economic opportunities, move back to towns and villages in rural areas from urban areas, and/or build/renovate houses in these areas as 'homes' for their current needs, or with a view to retirement, and (2) the State plans for the development of rural areas in a systemic and holistic way as economically viable, ecologically-significant, productive quality living spaces, as opposed to colonial and Apartheid times in which the little investment that was made in these areas was focused on advancing white economic interests in urban areas, and/or the lives and life chances of white people living in rural towns.

Settlement (also known as 'Human Settlement')

A settlement refers to a place where people live, work, study and relax. A settlement can range in size from a small number of dwellings grouped together, to a large city or groups/conglomerations of cities tied together through dense transport and communication networks.

Socio-Economic Impact Assessment System (SEIAS)

A recently introduced government instrument that seeks to enhance the process of formulating policies, Acts and regulations by ensuring (1) alignment of such interventions with national priorities, (2) mitigation of risks, (3) anticipation of unintended consequences, and (4) minimisation of costs and maximisation of benefits.

Space Economy

The spatial drivers and spatial manifestations and outcomes of the economic interactions and transactions that (1) are generated in 'earth/terra-based space', (2) take place in that space, and/or (3) flow through that space. The size, nature, scale and scope of the space economy of a place/area is related to (1) its unique locational, spatial, ecological, economic, social, institutional, infrastructural, mineral, soils and topographical attributes, culture, and history, and (2) its level of connectedness to, and relations with other places/areas, and the unique attributes and space economies of those places it is connected to, or transacts with.

Spatial Planning

The process of making strategic decisions as to (1) how and for what purpose public, communal and private-owned land in an area (it could be a street, town, province, country or continent) is to be used and developed in an environmentally sustainable, economically viable and affordable way, and (2) how these land portions are to be connected to

each other through road and rail networks and served with basic service infrastructure (water, electricity and sanitation) and communication networks (cellular, wi-fi and fibre).

Spatial Transformation

The carefully-planned and well-managed process of placing infrastructure, social services and economic activities in settlements in such a way that (1) the segregated spatial patterns inherited from colonial and Apartheid times are broken down, and (2) the inefficiencies, injustices and inequalities in access to opportunities resulting from these past patterns are corrected.

Strategic Water Source Areas

Strategic Water Source Areas (SWSAs) can be described as 'water factories' that support growth and development needs that are often a long distance away from the SWSAs themselves. These areas contribute significantly to the overall surface and ground water supply of the country. While Strategic Water Source Areas have been identified by the Water Research Commission (2015), they are not formally protected.

Stressed Catchments

'Water stress' occurs when the amount of water used exceeds 10% of renewable resources. Water stress depends on a range of factors and is not simply a shortfall in water availability versus requirement. Water deficits will not be experienced the same over an entire Water Management Area, nor at all times. In some cases, the deficits do not imply that consumptive use exceeds the available water, but that the allowances made for the implementation of the ecological component of the reserve cannot be met fully at present levels of use. Stressed catchments are also impacted upon by 'water demand/requirement', which refers specifically to the 'beneficial, effective and efficient use of water', which can be improved through, for example, a reduction in water losses.

Supra-National

Refers to (1) 'regions', organisations and structures that are created 'above the nation state' by two or more countries, e.g. the African Union and the Southern African Development Community, to attend to matters of mutual concern and/or that lie outside the control/reach of a single country, and (2) agreements, protocols, policies, plans and investment frameworks prepared for these bigger supra-national entities.

Sustainable Development

Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The definition of sustainable development usually refers to social, economic and institutional components.

Theory of Change

A story of how things, settings or situations can and will be changed through a well-planned and sequenced set of actions and interventions, to bring about a desired goal, situation or state of affairs.

Town

A place where people and services are geographically concentrated in a distinct and identifiable area. While towns can vary in size, they tend to have a smaller population, lower residential densities, fewer employment opportunities and fewer and/or smaller economic activities than cities.

Township

This term has two meanings in the South African context. *Firstly,* it is a *colloquial name* given to residential townships which were established

during the colonial and Apartheid eras for temporary occupation by Black South Africans on the outskirts of towns and cities, and where only the most basic of amenities and infrastructure were provided. During colonial times, these townships were called "locations", and sometimes still are, albeit increasingly less so. *Secondly,* it is the *legal name* given to new human settlements and extensions to existing settlements in planning legislation, e.g. "Sunnyside Extension 3", dating back to the first Town Planning Ordinances passed in the early 1900s, and also appearing in the more recent Spatial Planning and Land Use Management Act (2013) (SPLUMA).

Transit-Oriented Development (TOD)

A planned intervention that promotes higher density and mixed-use land development close to significant transit routes. TODs aim to (1) make the best use of land located along such routes, (2) increase ridership/use of public transport on the routes, and (3) promote sustainable urban development.

Urban

A term that refers to a city, being in a city, or 'of a city'. Urban areas are characterised by (1) large communities living at high residential densities, (2) a variety of employment opportunities, and (3) high-intensity business and commercial areas. The 'urban-rural distinction' between cities and towns varies from country to country, and is most often based on a combination of factors related to population size, level of economic output and development density. Generally, large towns are considered as 'urban', whereas small towns are most often regarded as 'rural'. 'Urban regions' in the context of the NSDF refer to large and growing, functionally integrated, built-up regions, that are characterised by areas of high residential density and economic intensity where the population exceeds more than two million inhabitants.

Urban Development

The process of improving the quality of life and economic well-being of people living in an urban area through planned interventions in the area in (1) the ownership and use of land, (2) the provision, maintenance and upgrading of infrastructure and social services, and (3) the type and intensity of economic activities.

Urban Edge

A line that is used as a border to distinguish between (1) an area/region that is regarded as part of a city or town, and (2) its surrounding natural or rural area. Its primary purpose is to 'contain the urban' and as such, (1) no urban development is permitted, and (2) no municipal services are to be provided outside/beyond the line. As in the case of a rural edge, the line may have coordinates and be statutory, meaning it has binding legal power, or be seen as a 'fuzzy/soft line', meaning its exact coordinates are not defined, and it is to be used in a planning and policy sense and not as a hard, impenetrable physical line.

Urbanisation

The process by which an increasing percentage of a country's population (1) moves to live in large towns and cities with the intention of staying there or in a similar urban area, and not returning to the countryside, and (2) is born in an urban area.

Water Scarce Regions

This construct refers to (1) the 'climate capability' of a region, which is a function of the moisture supply, climate constraints and physiological capacity of a region, and (2) the impact of climatic factors on the capability to grow an agricultural crop in a region within a growth season. For the purposes of the NSDF, areas described as 'Water Scarce Regions' fall within the 'low to low-moderate' climate capability ranges.

EXECUTIVE SUMMARY

This *National Spatial Development Framework (NSDF),* the first of its kind, seeks to make a bold and decisive contribution to bringing about the peaceful, prosperous and truly transformed South Africa, as articulated in the *Freedom Charter, the Reconstruction and Development Programme and the National Development Plan*. It does so in full recognition of:

- The *stranglehold* that the unjust *national spatial development paradigms, logics* and *patterns* of the past have placed on our many attempts at breaking the back of poverty, unemployment and inequality;
- The valuable, and often *hard lessons* we have learnt over the last twenty-five years in our pursuit of national reconstruction, inclusive economic growth and spatial transformation; and
- The *necessity* for decisive, collaborative and targeted *state action in national space,* to drive our country towards *the shared, inclusive and sustainable future* we desire and require.

In accordance with this *transformative agenda,* and guided by the Spatial Planning and Land Use Management Act, Act 16 of 2013 (SPLUMA), the NSDF consists of *seven interrelated parts:*

- *Part One* (1) provides an *overview of the background to, need for and role* of the NSDF, (2) locates it within the context of the National Development Plan (NDP), and (3) sets out the NSDF's *theory of change* to move the country from where we are, to the South Africa we want and need;
- *Part Two* provides an overview of *the process* that was followed in the compilation of the NSDF, including (1) the data that was gathered and processed, (2) the work-sessions that were held, and (3) the consultations and engagements that were undertaken;
- *Part Three* provides a *high-level overview of a series of significant national spatial development dynamics, challenges and opportunities* that impact upon, and shape both (1) the national development landscape, and (2) our ability to realise our national development goals;
- *Part Four* (1) puts forward the *national spatial development vision* of a shared and just South Africa, (2) sets out the '*shifts*' that must be made in the *national spatial development logic* based on the objectives and directives of the NDP and the SPLUMA principles, to enable a radical, transformative and decisive change in our national spatial development pattern, (3) puts forward six *national spatial development levers* to give spatial expression to the national spatial development vision, and support the shifts that need to be made in accordance with the new national spatial development logic, (4) provides a set of five required national spatial outcomes to *achieve* the *national development objectives,* as outlined in the *NDP*, and *realise* the *national spatial development vision* and desired *national spatial development pattern,* as outlined in the *NSDF,* and (5) gives an indication as to what life would be like in our country by 2050 if the vision is pursued, the necessary shifts are made and the six *national spatial development levers* are appropriately and effectively used;
- *Part Five* provides *national spatial development and investment guidance* in the form of (1) an *ideal national spatial development pattern,* (2) five *NSDF sub-frames,* and (3) five *national spatial action areas*, to inform, direct and guide all infrastructure investment and development spending decisions by government and the private sector, to enable us to achieve the desired national spatial development pattern for South Africa in 2050, and in doing so, realise our national development objectives, as set out in the *NDP*;
- *Part Six* deals with the *implementation* of the NSDF, and (1) outlines the measures, approach and actions required to realising our *national spatial development vision* in a coherent, diligent and systematic way, and (2) provides an overview of the role-players involved in doing so; and
- *Part Seven* provides a *summary of, and conclusion* to the NSDF.

While the NSDF recognises the challenges involved in bringing about the necessary changes in planning, budgeting and implementation *in* and *between* the three spheres of government, it is also very clear as to their importance in contributing to *the joint crafting of our desired and shared future*.

PART ONE: Introduction

1.1 Setting the Scene

In his first State of the Nation Address, President Cyril Ramaphosa, in recognition of the exemplary struggle, conquest and spirit of our former President Nelson Mandela, stated:

> *"In celebrating the centenary of Nelson Mandela, we are not merely honouring the past, we are building the future. We are continuing the long walk he began, to build a society in which all may be free, in which all may be equal before the law and in which all may share in the wealth of our land and have a better life. We are building a country where a person's prospects are determined by their own initiative and hard work, and not by the colour of their skin, place of birth, gender, language or income of their parents".*[ii]

Transitioning a country like South Africa with its dreadful history and stubbornly persistent legacy of the past into a better place for all, is no easy task, as was clearly articulated in the recently released report by the *High-Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change,* where it states the following:

> *"Colonialism and apartheid have left South Africa with a deeply divided and inequitable distribution of people and economic activity. This spatial inequality traps disadvantaged communities in poverty and underdevelopment, creates inefficient cities, and robs poor, rural people of secure livelihoods. The Panel makes recommendations that seek to break this damaging spatial pattern that is built on past laws, which marginalised the black majority to the outskirts of the cities and to Bantustans, to preserve key assets, economic opportunities and the wealth of the country for the white minority. The legacy of spatial inequality appears intractable despite the National Development Plan and the Spatial Planning and Land Use Management's (SPLUMA's) focus on it. This issue needs an integrated solution that goes beyond the mandate of any one government department or specific level of government."*[iii]

The importance of *space* and *land,* and their densely interwoven connections to economic development and livelihoods, was also recognised in the *Reconstruction and Development Programme* in 1994, where it was argued that:

> *"No political democracy can survive and flourish if the mass of our people remains in poverty, without land, without tangible prospects for a better life. Attacking poverty and deprivation must therefore be the first priority of a democratic government."*[iv]

1.2 The National Transformation Logic & Space

Encapsulated in the three preceding powerful statements, is a '*national transformation logic'* with a distinct *spatial dimension* (see **Figure 1**), which can be expressed as follows:

> Our new, post-Apartheid **'national development paradigm'**, which includes (1) a set of progressive national economic, social and spatial development objectives, values and ideals, and (2) an enabling and supporting national legal and policy framework, seeks to bring about

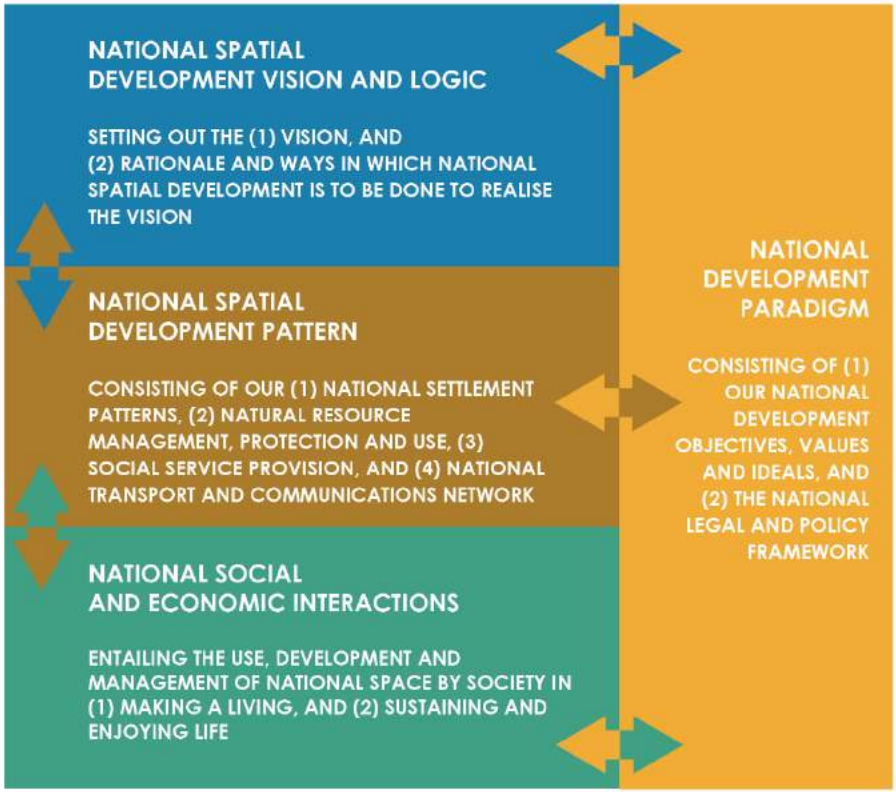
a new, post-Apartheid future. Realising this desired future, however, requires a new, post-Apartheid **'national spatial development logic'** and **'national spatial development vision'**.

Our current **'national spatial development pattern'** is an outcome of the **'national development paradigms'** and the **'national spatial development logics and visions'** of (1) the colonial and Apartheid eras, as well as (2) the first two decades of democracy. This **'national spatial development pattern'** is an enabler, driver and facilitator of a multitude of **'national social and economic interactions'**. These interactions, in turn, (1) shape the **'national spatial development pattern'**, either reinforcing and sustaining it, or changing it, and (2) confirm, or question the objectives, values, ideals, laws and policies that constitute the new, post-Apartheid **'national development paradigm'**, and prompt its amendment, as and where required.

Moving from our current, undesirable **'national spatial development pattern'** to the desired *new, post-Apartheid* **'national spatial development pattern'**, requires *targeted and sustainable interventions* in all *four the components of* the **'national transformation logic'**, in accordance with a credible and robust 'theory of change', which the NSDF puts forward.

Before getting to the NSDF's **theory of change** and the targeted, coordinated and integrated *(1) infrastructure investment* and *(2) social and economic development expenditure* it requires, it is important to get a sense of (1) what *has* been done, and (2) what we need to *start doing, stop doing, do more of, and do less of*. This is done in the following section (**Section 1.3**), which in turn is followed by a section (**Section 1.4.3**) in which the NSDF's theory of change is set out.

Figure 1: The National Transformation Logic



1.3 Taking Stock: National Spatial Development and the need for a NSDF

In this section, the following are considered: (1) where we come from and what needs to be undone, (2) what we have done and accomplished, and (3) what more, or what else still needs to be done and undone. This assessment is used to decide what changes we need to make, and the way in which the NSDF intends doing so.

1.3.1 Where do we come from and what needs to be done and undone?

In engaging the issues of 'space', 'spatial planning' and 'land', it is important to recognise the *spatial objectives and logic* of the colonial and Apartheid Eras, and their different, but equally divisive, underlying *economic and social logics*.

(a) The Colonial Era

In terms of the colonial **national development paradigm**, all economic activities (hunting, farming and mining) were done on land annexed by force, or through unfair 'deals' that benefitted the colonial empire. The resulting **national spatial development logic** consisted of railroads connecting mines and large farming clusters in the interior to harbours at the coast. From here, (1) commodities were exported, and (2) imports (primarily manufactured goods) were received and carried by rail into the interior. This logic laid the foundation for the country's infrastructure development pattern.

With the discovery of gold and diamonds, largely unplanned settlements sprang up. In accordance with the prevailing **colonial development paradigm**, these settlements were developed with only the benefit of the colonists in mind. The indigenous population was (1) forcefully removed from their land to make place for the economic activities and related settlements, and (2) economically coerced though taxation and loss of land, to provide labour to white-owned farms, mines and industries to make a living.

Land use and land development decisions were made only with the benefit of the colonists in mind. Spatial planning legislation and policy was *ad hoc* and responded to the immediate needs for regulation, order and colonial exploitation and accumulation. In the rapidly-emerging towns and cities, the resulting **national spatial development pattern** consisted of *racially-separated settlements* in which white people enjoyed (1) a privileged status, and (2) by and large, decent housing conditions. Black people were denied choice, dignity and respect, and treated as objects to support production by providing their labour at very low wages, and forced into so-called "locations" on the outskirts of these settlements.

(b) The Apartheid Era

The coming to power of the National Party in 1948, and the subsequent introduction of the racist **national development ideology/paradigm** of "Apartheid" brought about a new, carefully-conceived, all-encompassing set of laws and policies focused on systematic racial segregation, exclusion and suppression. These laws and policies (1) built on, (2) reinforced the exclusionary and exploitative **national spatial development logic**, and (3) entrenched and deepened the unjust and fragmented **national spatial development pattern** of the colonial era. However, *in contrast to* (1) the *earlier settler logic,* 'a new country' was now being crafted for the exclusive use and advancement of a white 'South African' minority, and (2) the *earlier colonial era,* indigenous Africans were now not only viewed as a source of cheap labour, but also

an increasingly vocal and numerically superior threat to 'the new country' and its white minority. To overcome this threat and develop the country, (1) the *use* of land and (2) the *spatial relation* of land-uses to each other, became of strategic importance. The resulting 'survive, suppress and rule' Apartheid **national spatial development logic** entailed the location of 'labour' as far away as possible from the country's economic hubs, but still within 'economically-feasible exploitation distance', i.e. as far away as the cost of rudimentary mass transport would permit. This hideous pursuit at one point even entailed the Apartheid planners considering locating "the next Soweto in the Karoo and transporting 'labour' on a daily base by high-speed train to the then Pretoria-Witwatersrand-Vaal Triangle industrial and mining core". At the same time, increasingly draconic measures were introduced to destroy any black economic endeavour that could compete with white mining, farming, manufacturing and retail activities and interests. Again, land was paramount in this pursuit, with (1) areas reserved for Black South Africans being placed ever-further away ('in the periphery') from areas of opportunity ('the core'), (2) large-scale forced removals of Black South Africans from where they were trying to access the opportunities offered by urban South Africa, or trying to set up businesses in these areas, and (3) areas set aside for Black occupation denied of any amenity or opportunity for economic activity.

In contrast to the earlier colonial era, **national spatial development planning** became the key means and driver for the creation and deepening of the segregated and unequal apartheid state and country: *It was a country solely planned and built for the enjoyment and advancement of a small white minority*. The black majority, in turn, were either (1) temporarily housed in "locations/townships", or (2) forced to stay in ethically-based Bantustans/homelands, and their movement to and from these rural areas to urban areas forcefully regulated through deeply oppressive measures, including the infamous passbook system.

Apartheid spatial planning and land allocation was not, as in colonial times, a reactive response to land-related crises as and when they arose; it was *a core component and driver* of the creation and organisation of the racist social, economic and **national spatial development logic** of the Apartheid State.

Over time, white South Africans living in towns and cities in Apartheid South Africa, simply by owning land, saw their land 'go' from 'land' to 'property'. This occurred through (1) the carefully planned parcelling, surveying and registration of such land, (2) the servicing of this land with public infrastructure (including social infrastructure such as schools and hospitals for whites), and (3) the protection of the value and amenity of such 'properties' and the suburbs in which they were located through town planning legislation and building regulations. Through (1) *spatial planning* and (2) *land use control*, white South Africans who owned land, gained 'property', i.e. *'land with a monetary value and with the potential to increase such value'*. From this base, white South Africans were able to access opportunities in towns and cities, attend well-resourced, good schools, and enter the job market in these or similar such places. In doing so, reproducing the **unjust social, economic and spatial development pattern** of wealth and privilege developed under the Apartheid system.

Black South Africans, in turn, who were able to get access to land, or retain access to land, were at best left with land that had little value to start with and quickly dwindled in value, due to (1) the spatial location of such land, and (2) the low spatial quality and lack of complimentary land-uses, amenities and economic activities in surrounding areas. It was a case of planned, orchestrated and forcefully implemented *'negative, destructive spatial planning'*. It actively disempowered Black South Africans, making them worse off, and destroyed the attributes and potential for any increase in property value that might have accrued to them.

This is the dreadful **national spatial development pattern** that democratic South Africa inherited in 1994 – the outcome of more than 300 years of unequal spatial investment and planning. It was, however, also *the spatial platform* (1) *on which,* and (2) *from which* the country's space economy and society had to be transformed and a new country built.

1.3.2 What have we accomplished and what more needs to be done?

Over the past twenty-five years, government has introduced several acts, policies and programmes aimed at redressing the spatial legacies of colonial and Apartheid rule. In most cases, these were directed at the municipal level, with the newly created municipalities expected to pit their limited *'local'* planning and financial powers against the spatial legacy of *centrally-orchestrated and implemented* apartheid spatial planning and land-use allocation. In most instances, the impacts were minimal. Old patterns were often reinforced, as new developments (such as RDP housing) were built in peripheral areas on *'readily available and cheap land'*. At the same time, the privileged spaces of Apartheid largely remained 'as is', with the racial integration that took place, focused in former white suburbs and new middle-to-higher income (1) *extensions* to larger towns and cities, and/or (2) *gated/barricaded enclaves* primarily in secondary cities and metropolitan areas.

In the national sphere, the *Reconstruction and Development Programme Office* explored the idea of a *National Spatial Development Framework (*1995-1996). Resistance from national sector departments and provincial governments, who did not want their infrastructure investment and development spending proposals interfered with, resulted in this plan being dropped. Following on from this, the Office of the Deputy President (and later the Presidency) introduced the *National Spatial Development Perspective (NSDP)* (2000-2007), which sought to rationalise, harmonise and integrate the investment and spending proposals of all government sectors and spheres. The NSDP, in turn, was criticised (1) as being *"neo-liberal, urban-focused and anti-rural"*, and (2) of *"taking a too narrow a view of development potential"*. The NSDP was never used as envisaged and fell out of favour.

Not much happened in the national planning space after the demise of the NSDP until (1) the publication of the *Green Paper on National Strategic Planning* in 2009, (2) the appointment of the first *National Planning Commission (NPC)* in 2010, and (3) the subsequent preparation and adoption of the *2030-National Development Plan (NDP)* in 2012.

(a) The 2030-National Development Plan (NDP)

The NDP, is an *all-encompassing comprehensive national development plan* that is grounded in:

- The ideals of the Freedom Charter;
- The tenets of the Reconstruction and Development Programme (RDP); and
- The principles and directives of our Constitution.

The NDP (1) speaks to the multitude of *needs and challenges* facing the country, their underlying causes and the factors inhibiting change, and (2) provides *detailed guidance* on responding to all of these. To address these challenges, which are all located in the *inherited colonial and apartheid space economy,* the NDP puts forward a series of proposals resting on *"six pillars"*, i.e.:

- Uniting all South Africans around a common programme to achieve prosperity and equity;
- Promoting active citizenry to strengthen development, democracy and accountability;

- Bringing about faster economic growth, higher investment and greater labour absorption;
- Focusing on the key capabilities of people and the state;
- Building a capable and developmental state; and
- Encouraging strong leadership throughout society to work together to solve problems.

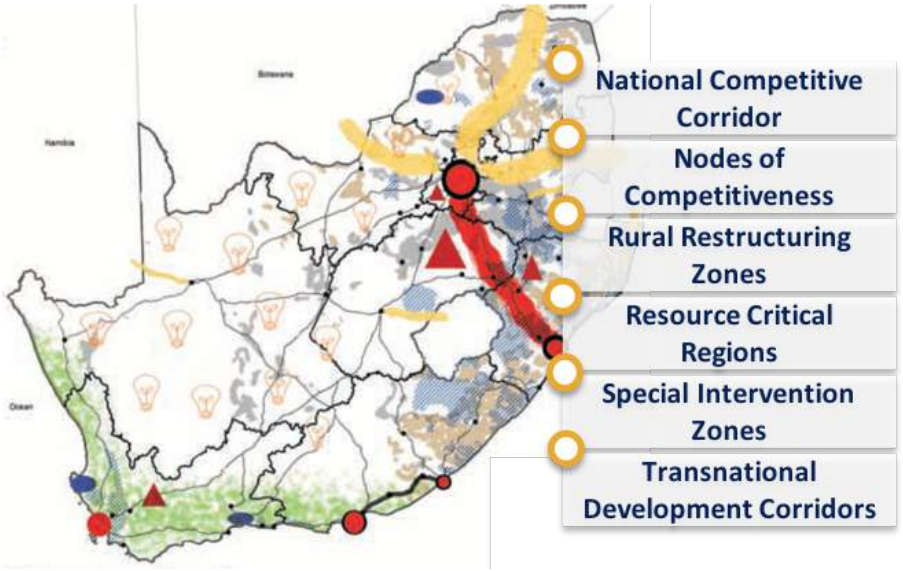
The NDP recognises that *overcoming our triple challenges of inequality, unemployment and poverty lies in transforming our physical space*. In doing so, it recognises that tackling the triple challenges means:

- Fundamentally *disrupting and undoing* inherited and persisting (1) colonial and apartheid economic, social and spatial investment logics, and (2) their resultant spatial forms and land-use patterns, which in turn impede inclusive economic growth and spatial transformation;
- Making radical changes *in* and *to* space; and
- Introducing a *national inclusionary economic growth and spatial transformation-focused investment and spending logic* that all spheres and sectors of government can (1) *buy into*, (2) *drive forward,* and (3) be *assessed on* in terms of the outcomes of their actions.

The NDP furthermore recognises that while transformation-focused action is required throughout our country, and in every sector and sphere of government, it is only through *radical and decisive intervention* that is *coherently planned for, and managed at the national scale,* that we stand a chance at (1) disrupting the Apartheid spatial logic and space economy, and (2) overcoming the inequities, isolation, fragmentation and costly and disruptive travel distances brought about by colonialism and Apartheid.

It is especially Chapter 8 of the NDP – "*Transforming Human Settlement and the National Space Economy*" – that makes specific reference to the need for a "*national spatial development framework*". Such a framework, it holds, must optimise, integrate and coordinate the energies and economic impacts of the strategic interventions in national space. Such '*national spatial framing*', in turn, is recognised as of crucial importance, given the significance of *space* and *access to land* in (1) bringing about *transformation at scale*, and (2) ensuring that *people and places benefit* from this intervention. The chapter also includes a "*proposed national schema for spatial targeting*" (see **Figure 2**) and (1) sets out a series of directives for such a framework, and (2) proposes that it be provided for in national legislation.

Figure 2: The NDPs Proposed National Schema for Spatial Targeting



Following on from this guidance, government prepared spatial and land-related policy and legislation that speaks to, and gives further expression to (especially) Chapter 8 of the NDP. These instruments, which cover (1) settlement planning, (2) place-making, and (3) land-use and land-use management, are the *2016-Integrated Urban Development Framework (IUDF)* and the *Spatial Planning and Land Use Management Act, 2013 (SPLUMA)*.

(b) The Integrated Urban Development Framework (IUDF)[v]

The IUDF, South Africa's national urban policy, takes as one of its key drivers the NDPs requirement that South Africa should see meaningful and measurable progress in the pursuit of more *functionally integrated, balanced and vibrant settlements*. It builds on, and responds to a variety of chapters in the NDP, but notably Chapter 8. This is evident in its guiding vision of *"liveable, safe, resource-efficient cities and towns that are socially integrated, economically inclusive and globally competitive, and where residents actively participate in urban life"*.

The IUDF puts forward a *"new deal"* for South Africa's cities and towns, which it sees as being on a continuum, ranging from the very large metropolitan regions to the smallest towns in rural South Africa. This new deal entails (1) maximising the potential of urban areas, and (2) integrating planning, budgeting and investment in such a way that it improves and enhances urban form and improves the performance or urban areas. The IUDF makes a strong case for:

- Working with and sharing the urban spaces built up during colonial and Apartheid times; and
- 'Retrofitting' our urban spaces to optimise their footprint and produce compact, coordinated and well-connected cities and towns.

The IUDF puts forward *"four strategic goals"* for all urban areas, i.e. (1) spatial integration, (2) inclusion and access, (3) growth, and (4) governance, and proposes *"nine policy levers"* to achieve these goals. These are:

- Integrated urban planning and management;
- Integrated transport and mobility;
- Integrated and sustainable human settlements;
- Integrated urban infrastructure;
- Efficient land governance and management;
- Inclusive economic development;
- Empowered active communities;
- Effective urban governance; and
- Sustainable finances.

The IUDF furthermore introduces three *"cross-cutting priorities"* that are to be used in the conceptualisation and implementation of the nine policy levers. These are: (1) rural-urban interdependency, (2) urban resilience, and (3) urban safety. While making strong, guiding statements in the pursuit of shared, inclusive, resilient and liveable urban settlements, the IUDF cautions against a one-size-fits-all approach. Instead, it recognises that South Africa has different types of cities and towns that perform different roles, and have different requirements.

The IUDF has a multi-faceted *implementation plan,* including short-term interventions. These require the active participation of a range of stakeholders, including all three spheres and sectors of government, the private sector, NGOs, NPOs and local community organisations. The IUDF is also being used to prepare South Africa's *"Localisation Framework"* for implementation of the global Urban Agenda – in this way advancing the global pursuit of *SDG Goal 11: "Make cities and human settlement inclusive, safe, resilient and sustainable"*.

(c) The Spatial Planning and Land Use Management Act, Act 16 of 2013 (SPLUMA)

SPLUMA was introduced to "*provide a framework for spatial planning and land use management*" in South Africa. As such, it not only seeks to attend to and rectify the fragmented, unequal and unfair apartheid planning system inherited from the Apartheid era, but also its consequences in space. As in the case of the IUDF, this means the active pursuit of (1) *spatial transformation* and (2) *social and economic inclusion*, to ensure *equal access for all* to the services, amenities and opportunities that *well-planned, well-functioning and well-managed* urban and rural settlements offer. Core in this regard is the introduction of single, uniform spatial planning and land use management systems in municipal areas that include places previously excluded from such systems. Being framework legislation, it seeks to provide "*principles, guidance and norms and standards*" for planning in the provincial and municipal spheres of government. The five "*principles*", which must be adhered to, pursued, and observed in all actions undertaken in terms of the Act, are "*spatial justice, spatial sustainability, efficiency, spatial resilience and good administration*".

SPLUMA furthermore:

- Mandates the preparation of "*Spatial Development Frameworks*" (SDFs) by all three spheres of government, including the "*National Spatial Development Framework*";
- Provides for the preparation of "*Regional Spatial Development Frameworks*"; and
- Distinguishes between (1) *spatial planning* and (2) *land use management,* and establishes a link between the two.

Being located within the Constitutional realm of cooperative governance, these frameworks are not positioned in a hierarchical order, but instead as interdependent planning instruments that require intergovernmental collaboration and integration in their preparation, review and implementation.

(d) Summary

Assessing what has been done and accomplished over the last twenty-four years in terms of the **National Transformation Logic** (**Section 1.2** and **Figure 1**), the verdict clearly is that *much has been done*:

With regards to the **national development paradigm,** the (1) Constitution and (2) Cabinet-adopted NDP provide the foundation, and strategic direction for government to respond to our *inter-related triple challenges* of *inequality, unemployment* and *poverty*. These are supported by a series of (1) enabling acts and policies, (2) solid sector plans and programmes, and (3) strategic infrastructure investment programmes, which include the New Growth Path, the Industrial Policy Framework and Industrial Policy Action Plans, the Strategic Integrated Projects, the National Transport Master Plan 2050 and a range of national plans for human settlement.

With regards to the **national spatial development logic**, Chapter 8 of the NDP, and the IUDF and SPLUMA frame, mandate, allow and guide the changes that need to be made in:

- *Our space economy,* in terms of (1) what we do, where and why, (2) which resources we use, and how we use them, and (3) who participates in, and benefits and gains from these activities; and

- *Our settlements,* in terms of (1) how, and with what outcomes in mind, we plan and invest as a country, (2) how and where we provide which services, and (3) how we sustain these services.

This they do by enabling:

- The *use of spatial development planning to integrate and optimise* all public and private sector infrastructure and investment spending proposals in space, both (1) in the national interest, and (2) to the advantage of local spaces and those who live their lives in these spaces; and
- The *radical, decisive and sustainable transformation of our settlements* into productive, liveable and resilient places for all, through (1) wise spatial planning and land-use planning, development and management, and (2) the provision of access to land, economic opportunities and all the other amenities and opportunities that good, quality settlements offer.

However, when considering the **national spatial development pattern**, and the **national social and economic interactions,** and as echoed in numerous government reports, academic papers and the printed and social media, despite these components being in place, *the stubborn persistence of the colonial and Apartheid spatial development patterns suggests that something is amiss.* While much has been done and achieved in the ambit of legislation and policy, not that much change has been (1) *felt* in the daily lives of people, or (2) *seen* on the ground.

Leading on from the **National Transformation Logic,** as set out in **Section 1.2**, it would follow that this '*change-deficit*' could be due to:

- There being a **new national development vision**, as provided by the NDP, but *not* a new and/or broadly accepted **post-Apartheid national spatial development vision**;
- The **enabling and supporting legislation and policy** *not* being adhered to and/or implemented (1) in the way that they are meant to be, including *not* in an integrated, coordinated and targeted way, and/or (2) without *a collective, national focus* on the crucial issues of '*land*' and '*space*';
- *Not* enough time having passed for the necessary transformatory changes to have been made in terms of the **legal and policy framework**, and/or their effects to be felt in space (notably in the case of the 2013-SPLUMA and the 2016-IUDF); and/or
- The **national spatial development logic** *not* having changed from its earlier colonial and Apartheid versions, and/or its transition to a **post-Apartheid national spatial development logic** not being actively pursued and/or enforced.

Lending from a large evidence base of government reviews, reports, assessments and academic papers, notably the recent High-Level Panel Review and the 2018-World Bank Report on South Africa, *it is argued that all of the above explanations are at play*. At the same time, another possibility is put forward, i.e. that *while there is agreement as to what we want to move from in terms of **past national spatial development patterns**, there is not clarity and/or agreement as to what the desired **post-Apartheid national spatial development pattern** should look like*. Without such spatial clarity and guidance, public investments are made in accordance with (1) *sector-driven* objectives, targets and outcomes, and/or (2) *place/territorially-based* concerns and challenges, without consideration for *the national transformative impact.*

It is here where the NSDF seeks to intervene…

Given the newness of an intervention like the NSDF for our country, international precedent and experience with such national-level planning instruments is briefly engaged, before moving on to the NSDF.

1.3.3 International Precedent and Experience

Internationally, *national spatial planning* with typically a *twenty to thirty-year time horizon,* has primarily been a feature of:

- *Smaller European countries,* notably the Netherlands and Denmark, and more recently Ireland, Albania, Serbia, Slovenia, Iceland, Estonia, Wales, Scotland, Portugal and Romania;
- *Developmental states in Asia,* notably China, Singapore, Malaysia and South Korea; and
- *African countries* at two different stages, i.e. (1) shortly after independence, and, in more recent times, (2) before or during a rapid growth phase as in the case of Ghana, Kenya, Uganda, Rwanda, Namibia, Botswana and Tanzania.

In most cases, such planning is associated with (1) more unitary states where the mandate and role of national planning in such arenas is either not, or less contested, and (2) countries where such planning is viewed in a favourable light due to its link to national economic planning and growth, *especially the triggering of such growth.* The mood of the time and the ideological home of the national governing party is also important. For example, in times of greater national and/or global support for state involvement in the economy, and/or tighter monetary conditions, such planning has generally been more welcomed. Likewise, the support for spatial planning, and especially national spatial planning, has (1) *ebbed* in accordance with the election of more pro-market, neo-liberal parties, and (2) *risen* with the election of parties that hold a more favourable view of state or developmental intervention in the economy.

The mere existence of such national spatial plans, strategies or frameworks has not necessarily meant that they (1) were implemented, or (2) had the desired impact. In many cases, the notion of one 'super-plan' imposing itself on the mandates of other sectors in the national tier of government and/or in sub-national tiers of government has not been welcomed. Furthermore, given that such instruments often have coordinating, integrating and guiding functions, and do not have their own budgets, they have struggled to secure buy-in and support. In other cases, (1) failure to fund, or (2) deliberately withholding funding from the entity responsible for the preparation and/or implementation of the instrument, for whatever reason, has seen it have little else but a life on paper and/or a website. Finally, the power, status and 'popularity' of the department or entity responsible for the instrument and/or the politician(s) responsible for or involved with it, has played an important role in its acceptance and use.

Where such instruments have worked, this has in most instances been due to:

- The entity preparing it, managing to secure *strong support from the outset* of the preparation process for the instrument both in and outside of government;
- *Political will,* coupled with decisive and capable *state action*;
- A strong and vocal *technical lobby of planners, researchers and academics* supporting it; and/or
- A clear, *tangible need* for it, and a prevailing sense amongst the population at large that it could make a meaningful difference in (1) the fortunes of the country, and (2) their lives.

1.4 The NSDF as Tool for National Spatial Development and Transformation

1.4.1 The NSDF's Mandate

In terms of *government policy,* Chapter 8 of the NDP calls for the preparation of a "*national spatial development framework*". In terms of *legislation,* Section 5(3)(a) of SPLUMA provides for, and Sections 13(1) and (2) of the Act mandate the Minister to, "*… after consultation with other organs of state and with the public, compile and publish a national spatial development framework*" and review it at least once every five years.

1.4.2 The NSDF's Purpose, Focus and Content

Section 13(3) specifies that the National Spatial Development Framework (NSDF) must consider:

- All policies, plans and programmes of public and private bodies that impact on spatial planning, land development and land use management;
- Any matter relevant to the coordination of such policies, plans and programmes that impact on spatial planning, land development and land use management; and
- All representations submitted to the Minister in respect of the framework.

Section 14 sets out the content of the NSDF, and indicates that the framework must:

- Give effect to the development principles and norms and standards set out in the Act;
- Give effect to all relevant national policies, priorities, plans and legislation;
- Coordinate and integrate provincial and municipal SDFs;
- Enhance spatial coordination and land use management activities at national level;
- Indicate desired patterns of land use in the country; and
- Take cognisance of any environmental management instrument adopted by the relevant environmental management authority.

Section 12(1), which also deals with the SDFs of provincial governments and municipalities, specifies that the NSDF must:

- Interpret and represent the spatial development vision of the national sphere of government;
- Be informed by a long-term spatial development vision statement and plan;
- Represent the integration and trade-off of all relevant national sector policies and plans;
- Guide planning and development across all sectors of the national sphere of government;
- Contribute to a coherent, planned approach to spatial development in the three spheres of government;
- Provide clear and accessible information to the public and private sector, and provide direction for investment purposes;
- Include previously disadvantaged areas, areas under traditional leadership, rural areas, informal settlements, slums and landholdings of State-Owned Enterprises and government agencies, and ensure their inclusion and integration into the spatial, economic, social and environmental objectives of the national sphere of government;
- Address historical spatial imbalances in development;

- Identify the long-term risks of particular spatial patterns of growth and development and the policies and strategies necessary to mitigate those risks;
- Provide direction for strategic developments and infrastructure investment, promote efficient, sustainable and planned investments by all sectors, and indicate priority areas for investment in land development;
- Promote a rational and predictable land development environment to create trust and stimulate investment;
- Give effect to national legislation and policies on mineral resources, and the sustainable utilisation and protection of agricultural resources; and
- Consider, and where necessary, incorporate the outcomes of substantial public engagement in the framework.

Section 12(2)(a) specifies that the three spheres of government must *participate* in the spatial planning processes that impact on each other, to ensure that their plans and programmes are coordinated, consistent and in harmony with each other.

Section 12(2)(b) specifies that the NSDF must *guide and inform* the exercise of any discretion of, or any decision taken in terms of the Act, or any other law relating to land use and development of land by the national sphere of government.

Section 12(3) specifies that the NSDF must *contribute to and give spatial expression* to national development policy and plans, as well as integrate and give spatial expression to policies and plans emanating from the various sectors of national government, and may include any "*Regional Spatial Development Framework*".

Section 12(6) specifies that the NSDF must *outline specific arrangements for prioritising, mobilising, sequencing and implementing* public and private infrastructural and land development investment in the priority spatial structuring areas identified in the framework.

In **summary**, as indicated in **Figure 3** (below), the NSDF *must,* within the broader 'family' of strategic and sector plans of government:

- Target and direct all infrastructure investment and development spending decisions by *all national sector departments and State-Owned Enterprises (SOEs)*;
- Guide and align plan preparation, budgeting and implementation *across spheres and between sectors of government*; and
- Frame and coordinate *provincial, regional and municipal spatial development frameworks*.

1.4.3 The NSDF's Theory of Change

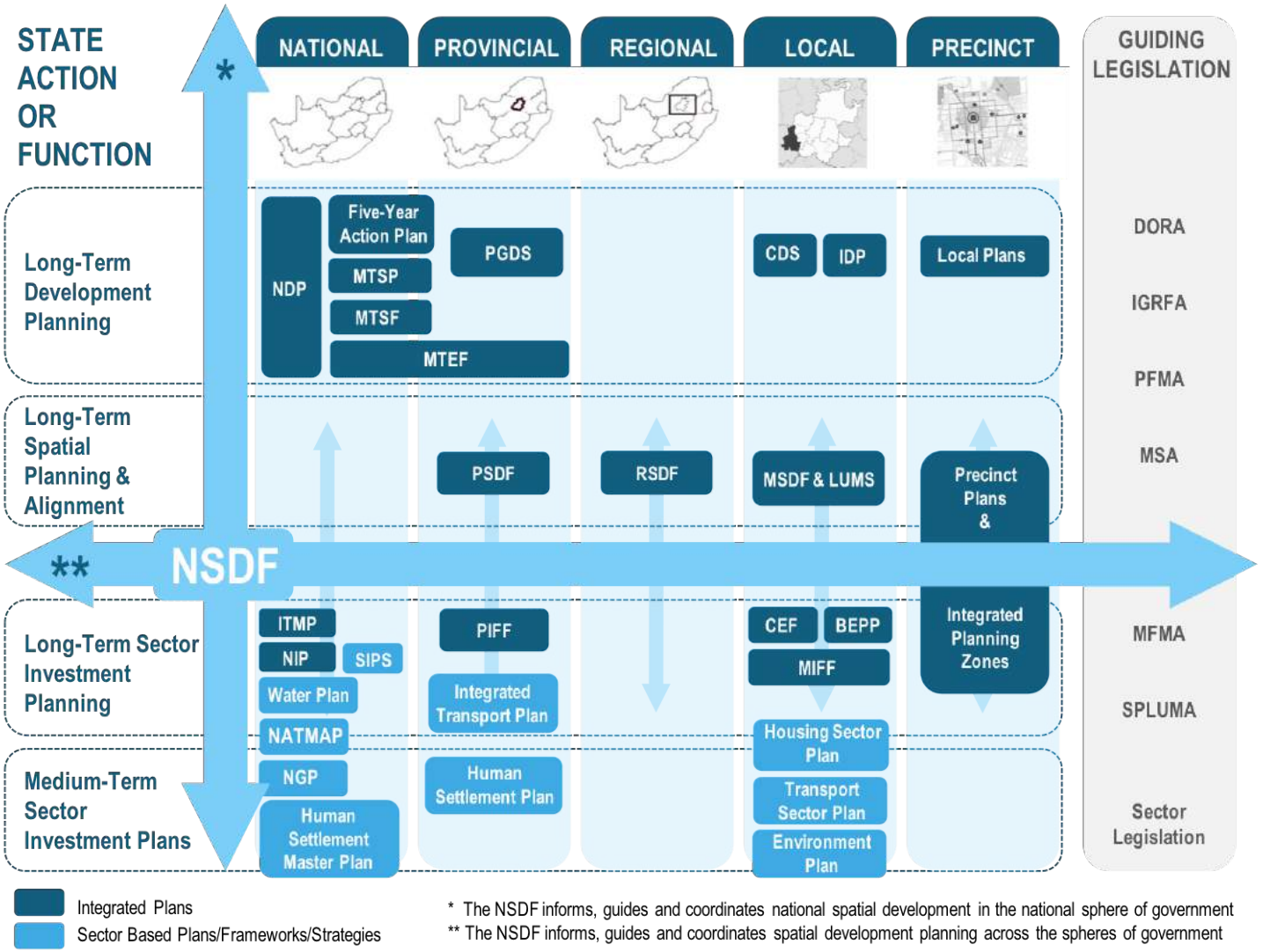
Based on (1) the *National Transformation Logic* as set out in **Section 1.2**, (2) the gaps and explanations as identified in the stock-taking exercise in **Section 1.3**, and (3) the legal requirements regarding the NSDF as set out **Section 1.4.2**, the *NSDF's Theory of Change* to move our country to the desired Post-Apartheid future, is as follows:

- **Step 1:** The existing **national development paradigm**, including the Constitution, the NDP and the existing legal and policy framework, notably SPLUMA and the IUDF, is used to:
    - Articulate a *compelling and persuasive* **post-Apartheid spatial development logic** and identify the '*shifts*' from the old and existing logics that this *new logic* requires; and
    - Craft a *strong and credible* **post-Apartheid national spatial development vision**;

- **Step 2:** The new logic and vision is used together with an analysis of the *current and unfolding 'national spatial development landscape'*, to develop a set of *national spatial development levers,* and craft a *desired* **post-Apartheid national spatial development pattern***;*
- **Step 3:** The **post-Apartheid national spatial development pattern** is used to indicate what actions, interventions and priority actions are required to ensure transition to this desired pattern;
- **Step 4:** The **post-Apartheid national spatial development pattern** and interventions and priority actions are used to prepare clear *implementation guidance* for realising the desired national spatial transformation; and
- **Step 5:** The spatial development guidance, tasks and actions as set out in the NSDF are implemented, and (1) movement towards the realisation of the desired **post-Apartheid national spatial development** pattern monitored and assessed, and (2) corrective measures taken as and where required.

The outputs of these steps provide the structure for this document, as set out in **Section 1.5**.

Figure 3: The Role of the NSDF within the 'Family' of Strategic and Sector Plans of Government



1.5 Document Structure

This document has the following parts:

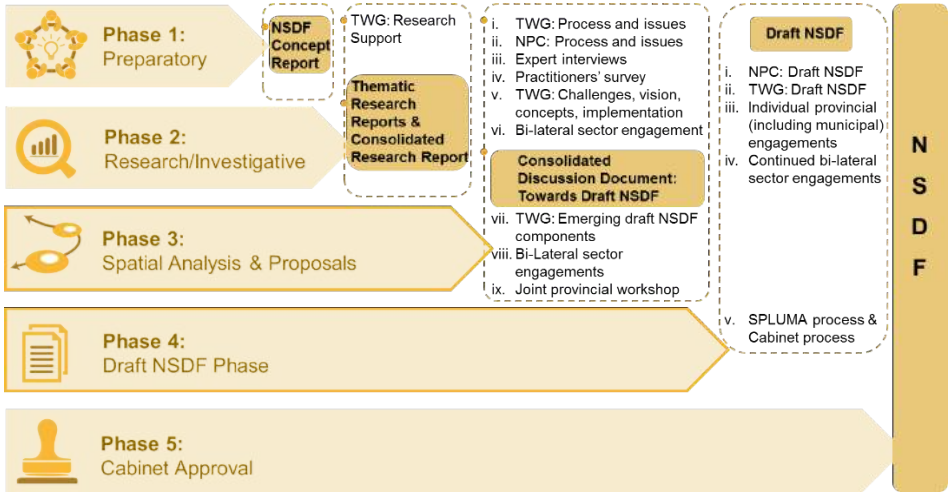
Figure 4: Document Structure

PART TWO: The Draft NSDF Preparation Process

2.1 Introduction

The process of preparing the first NSDF for South Africa started in April 2014. The formulation of the Draft NSDF comprised Phases 3 and 4 of the process, as indicated in **Figure 5**.

Figure 5:: NSDF Preparation Process



2.2 Preparatory Work and Research Phase

The first two phases of the NSDF compilation process started with the preparation of the "*NSDF Concept Document*" by the Department of Rural Development and Land Reform (DRDLR), which set the parameters for the remainder of the process. This was followed by an intensive process of research into thematic areas that (1) influence, and (2) are influenced by, the spatial legacies and dynamics of the South African landscape. The *Thematic Research Reports* provided the basic diagnostic for the NSDF, and focused on:

- Population dynamics, migration and people;
- Human settlements;
- Social infrastructure;
- Natural resources and the environment;
- Movement and transport;
- The national space economy; and
- Unemployment, labour, education and skills development, with an emphasis on rural development, land reform and agriculture.

At the outset of the NSDF process, the NSDF Technical Working Group (TWG) was established as a multi-stakeholder forum including representatives from (1) national sector departments, (2) Offices of the Premier and provincial sector departments involved in planning, (3) SOEs, and (4) relevant government agencies and organisations.

2.3 Spatial Analysis and Proposals Phase

The third phase of the process, i.e. Spatial Analysis and Proposals, was conducted in a series of work-streams, as follows:

2.3.1 Foundational Work

The focus of this work-stream was to (1) establish the most significant global, national and inter-regional spatial development opportunities and challenges, and (2) develop a draft national spatial vision and set of national spatial development levers. Foundational work was also done for the *Socio-Economic Impact Assessment System (SEIAS)*-process. Engagements in this phase included (1) NSDF Steering Committee meetings, (2) introductory presentations to the NSDF TWG, (3) expert inputs, (4) bilateral meetings with selected sector departments, and (5) an online survey conducted with planning professionals.

2.3.2 *Preliminary Sharing and Testing*

The focus of this work-stream was on *sharing and testing* (1) the list of national *opportunities and challenges,* and (2*) the draft proposals* prepared in the Foundational work-stream. With this objective in mind, a '*Consolidated Draft Discussion Document'* was compiled, to enable (1) a *focused discussion* with, and (2) the *sourcing of inputs, comments and proposals* from national and provincial government departments, municipalities, SOEs, the NPC, the South African Local Government Association (SALGA) and stakeholder organisations, such as the South African Cities Network (SACN). Work-sessions were also held with the NSDF TWG and provincial officials responsible for the preparation and review of PSDFs, and submissions made to the NPC.

2.4 Draft NSDF Phase

This phase entailed (1) *the preparation of the 'first Draft NSDF'* based on the outputs of the previous work-streams and the inputs, comments and proposal made during these phases, and (2) *structured engagement on the Draft NSDF,* as provided for in SPLUMA (see **Figure 6**). These engagements included:

- A presentation to the NPC;
- A presentation to, and work session with the TWG;
- Provincial workshops in all nine provinces involving stakeholders from municipalities, provincial departments and the private sector; and
- Bilateral engagements with national sector departments.

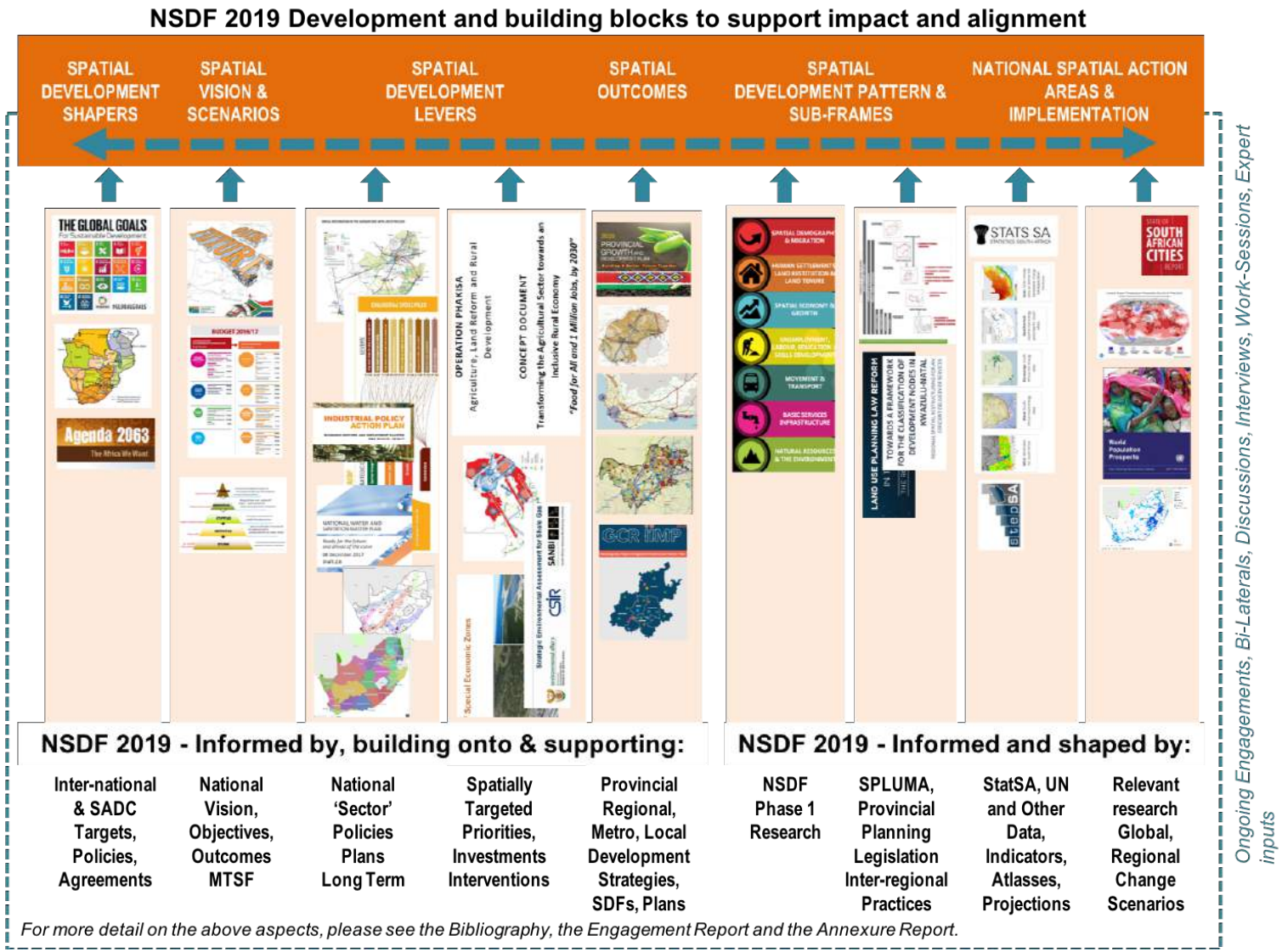
The Draft NSDF was revised and amended based on (1) further data-gathering and analyses, and (2) inputs and comments made during the engagement sessions, and written submissions received after the events.

It is envisaged that this '*new Draft NSDF'* will be engaged both further and wider, and include the 'sixty-day public commenting period', as prescribed in Section 13(4)(b) of SPLUMA.

2.5 Cabinet Submission Phase

The final phase will entail the preparation of (1) the '*Final Draft NSDF'* for Cabinet Submission, taking cognisance of public comments and inputs, and (2) the *documentation,* as required in terms of the SEIAS-process.

Figure 6: NSDF 2019 Development and Building Blocks to support Impact and Alignment



PART THREE: National Spatial Development Shapers

3.1 Introduction

A wide and diverse range of (1) *national* spatial development realities and (2) *international, national and sub-national* trends, flows and patterns impact upon, and *shape* both the national development landscape, and our *ability* to realise our national development goals.

Part Three of the NSDF provides some insights into these inter-related *national spatial development dynamics, challenges and opportunities.* It draws on, and highlights aspects as raised in and by:

- An extensive diagnostic conducted in the earlier stages of the preparation of the NSDF, and captured in a '*Consolidated Research Report*' (see **Section 2.2**);
- Supra-national, national and provincial development plans, policies, frameworks and overviews;
- National discourses, newspaper reports, books and book chapters, journal and magazine articles, and published and unpublished research reports; and
- Modelled spatial implications of a series of population growth and climate change scenarios.

The NDP objectives, SPLUMA principles and NSDF vision statement were used *in an iterative way as lens* to (1) 'read' the South African national spatial development and planning landscape, and (2) identify key national spatial development dynamics, challenges and opportunities. From this analysis, ten '*shapers*' of *national spatial settlement and development* were put together. These shapers are discussed in **Sections 3.2** to **3.12** below. In each case, the scale and extent of 'the shaper', and its implications for (1) national space, (2) the national space economy and/or (3) national spatial governance are highlighted, and connections to other shapers highlighted. Interspersed between the ten shapers are a series of thematically-structured '*Info Charts*' under the following themes:

- People and Places;
- Ecologies, Economies and Spaces;
- Institutions and Services; and
- Movements, Connections and Flows

These charts capture and present in visual form key information pieces and elements, as referred to under the shapers. The section is concluded with a *summary* (see **Section 3.12**) of the most significant national spatial development challenges and opportunities extracted from the ten shapers.

3.2 Demographic Shifts, Dividends, Vulnerabilities and Diversity

In the next 31 years, the South African population will grow by at least another 17 million people, from around 58 million people in 2018, to around 75 million by 2050. In addition to a population that will be 30% larger than we currently have, it is anticipated that (1) it will primarily be an *urban-based population*, and (2) at least 30 million of the 75 million South Africans (40%) are likely to be *living below the Minimum Living Level (MLL)*.

In terms of composition, the very youthful South African population of today (28% of the population is below 15 years of age) will by 2050 still be regarded as young, with 25% of the population below 15 years of age, and 31% between 15 and 34 years of age, and in their primary childbearing years. The share of the population that will be '65 years of age and older' will also have experienced significant growth, by 2050 constituting 8% of the population, i.e. 6 million people, which is nearly

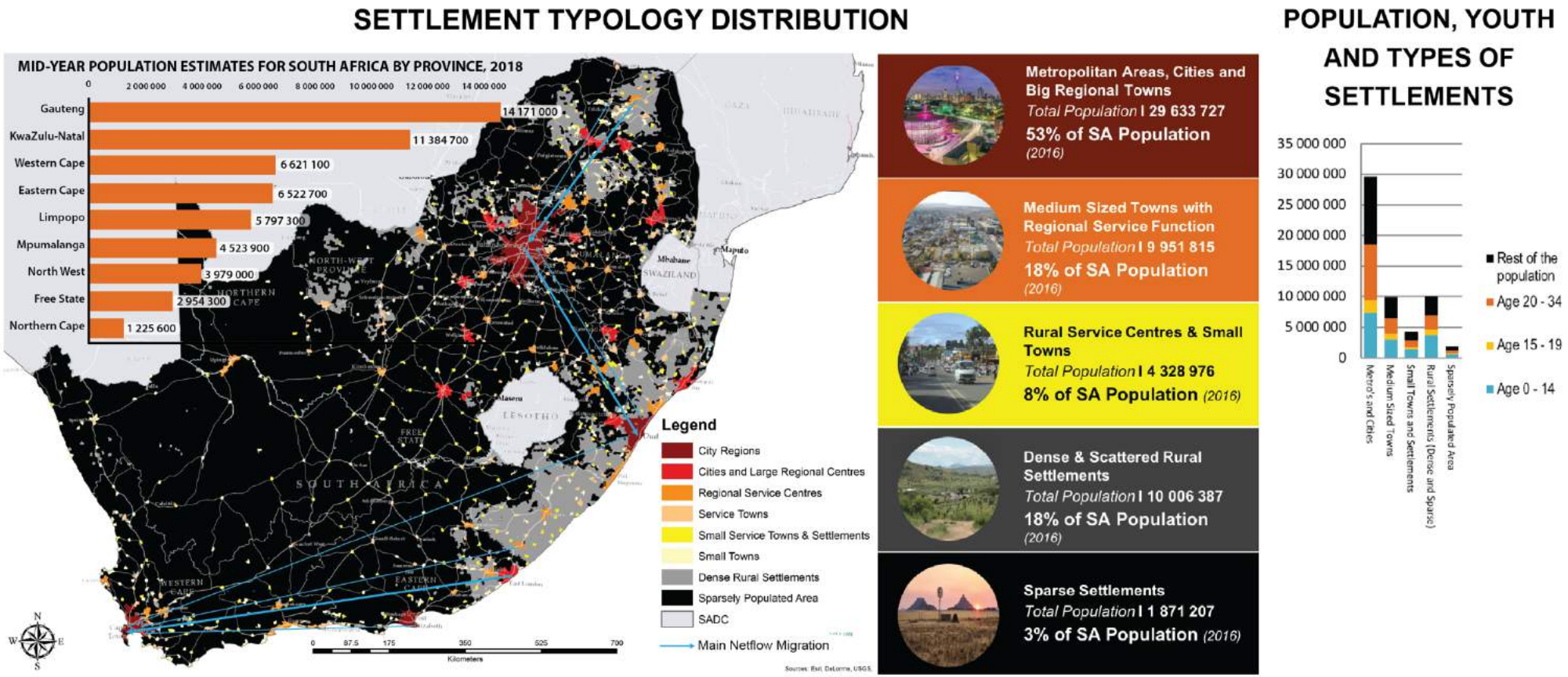
double the 3.2 million people that were '65 years of age and older' in 2018. This group will require increasingly more health and frail care and income support from households, communities and the State. This will of course open up and create a large number of job opportunities for frail and health care workers, many of which may be created in rural areas, if this is where, as anticipated, most of those above 65 years of age will choose to live.

Given that the bulk of the envisaged *youthful population* will be living in urban areas, it will potentially present the country with a '*dynamic-triple-dividend'*: (1) a large, dynamic, creative and innovative economically active population living at high densities in a few large places, constituting (2) a large, densely connected consumer market for goods and services, and (3) a far more accepting and accommodating approach to difference and diversity, which will be especially important in the large urban conurbations of the future. It is especially the higher densities at which our people will be living, coupled with the greater need to co-produce and collaborate in such spaces, that may create and instil a different view of each other – *more accepting and more celebratory of difference, and more mindful of the contribution that different individuals and groups can make to resolving a challenge or problem in an innovative and sustainable way*.

This 'dynamic-triple-dividend' is, however, not a given, and may not materialise, in which case our youth could become a very volatile and destructive force. Should this youthful population (1) be raised in a caring environment with adequate food, love and care, (2) be well-educated and (3) be well-integrated in society, the 'full' dividend is more likely to materialise. Should the opposite prevail, as is currently the case for large numbers of our youth growing up in deeply impoverished rural areas and townships, *only parts of the dividend,* or none of it at all will be realised, with severely negative consequences. As for the greater acceptance of difference and diversity, should (1) scarcity, and (2) an unwillingness to share the little that is available prevail, this dividend will also not materialise. In such an event, our urban areas could very likely see more of the xenophobia and other forms of hatred of '*those who are seen to be different'*, and this will be to the detriment of our cities transitioning into dynamic cosmopolitan economic powerhouses.

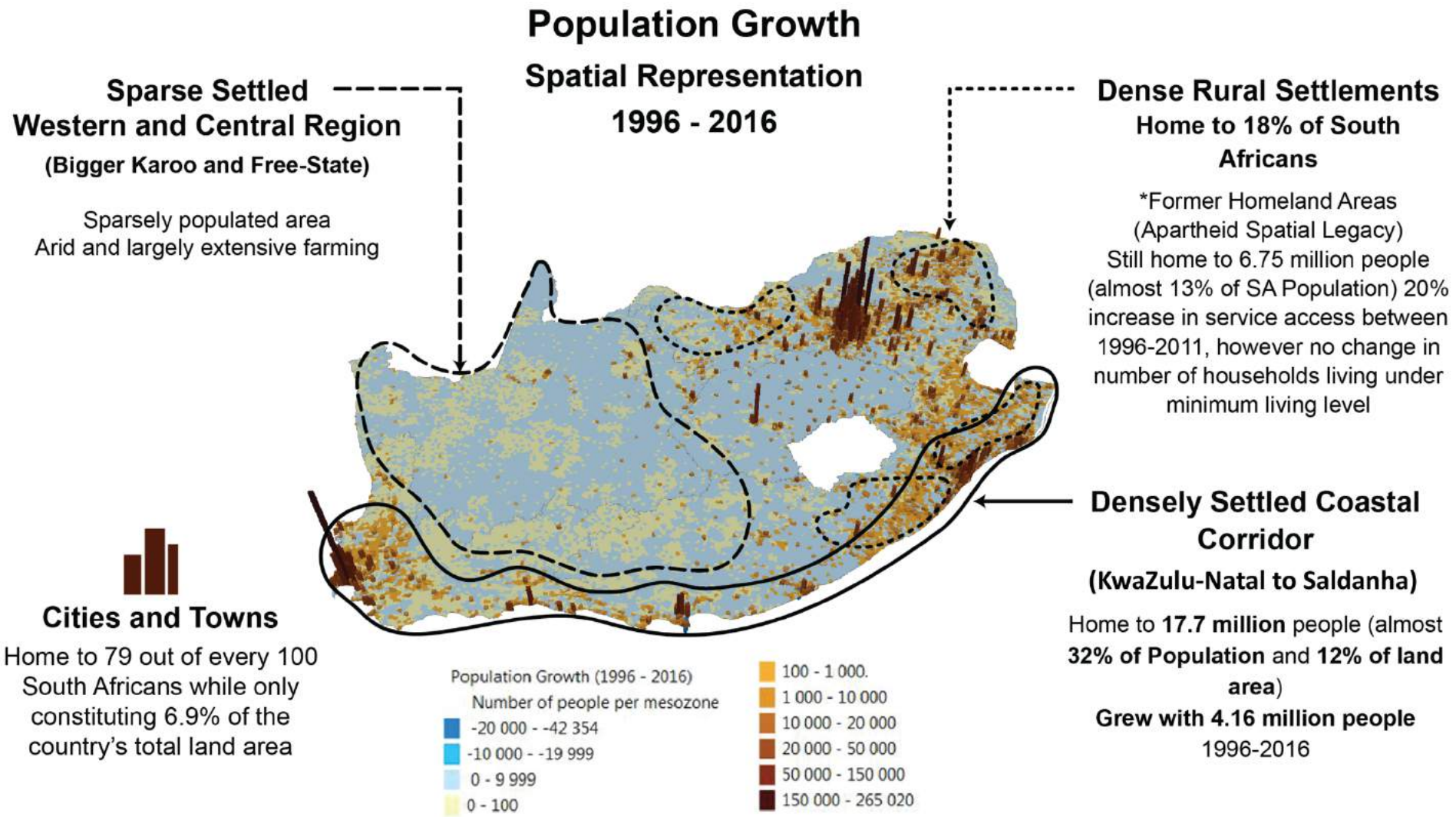
Merely hoping that the dynamic-triple-dividend will materialise by itself, especially given our historically high levels of poverty and inequality, is not a sensible strategy. To realise the 'full' dividend will require that it be actively pursued, with the State playing a critical role in this regard. Support for nutrition programmes, housing, care and access to economic opportunities for our youth will need to be attended to. All State plans will also need to be prepared with *an emphasis on youth and diversity*. At the same time, those *national spatial development patterns and settlement forms* that will be better at (1) eliciting the dividend and (2) allowing it to flourish, will need to be pursued. These include (1) developing urban settlements at higher densities, (2) greater mixing of land-uses, and (3) greater accessibility to the services that successful, well-connected, dynamic urban areas offer.

Figure 7: People and Places – Population and Settlement Dynamics



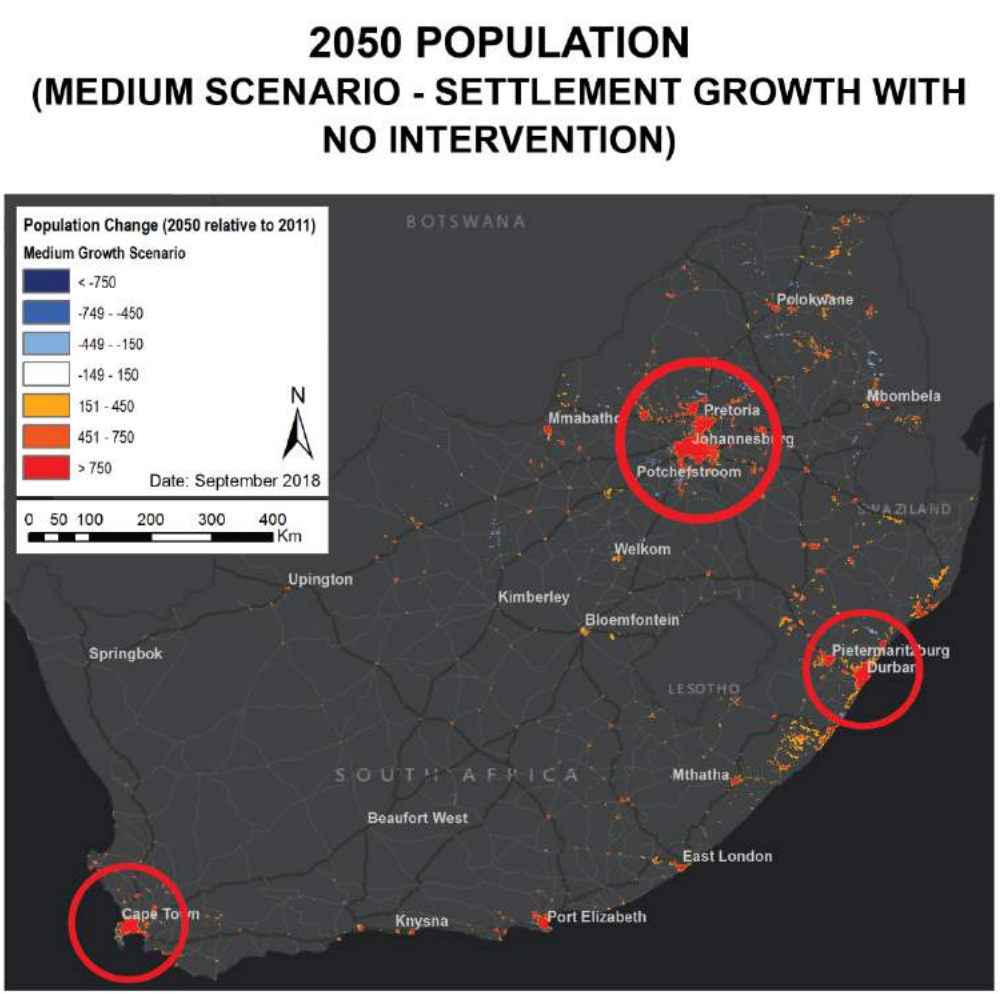
Population Characteristics and Settlement Dynamics Based on StatsSA, 2011, 2018; Quantec 2016, CSIR Town Typology 2018, Vulnerability and Migration Indicators – See Annexure A

Figure 8: People and Places – Population Settlement and Growth Dynamics



Demographic change using CSIR Town Typology, 2018. See Annexure A

Figure 9: People and Places – Demographic Growth Scenarios



Demographic modelling and scenarios developed through CSIR, Green Book-project, 2008, using CSIR Town Typology, 2018. See Annexure A

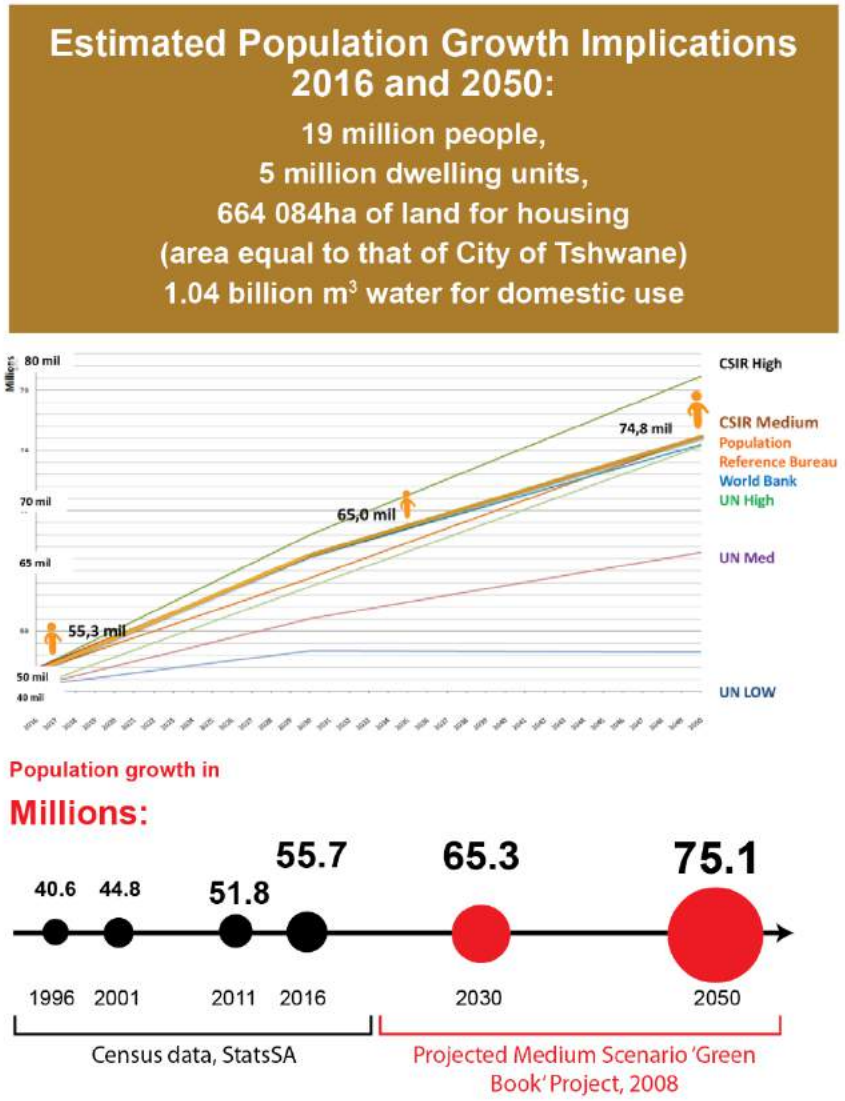
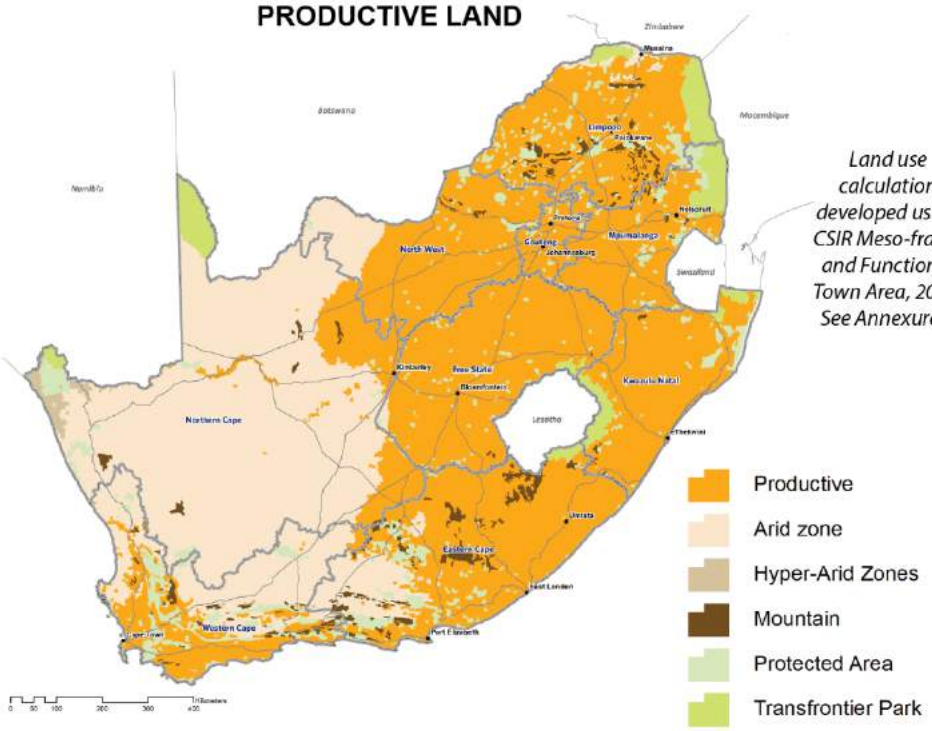


Figure 10: People and Places - National Land Use

NATIONAL LAND USE

PRODUCTIVE LAND



Land use calculation developed using CSIR Meso-frame and Functional Town Area, 2018. See Annexure A

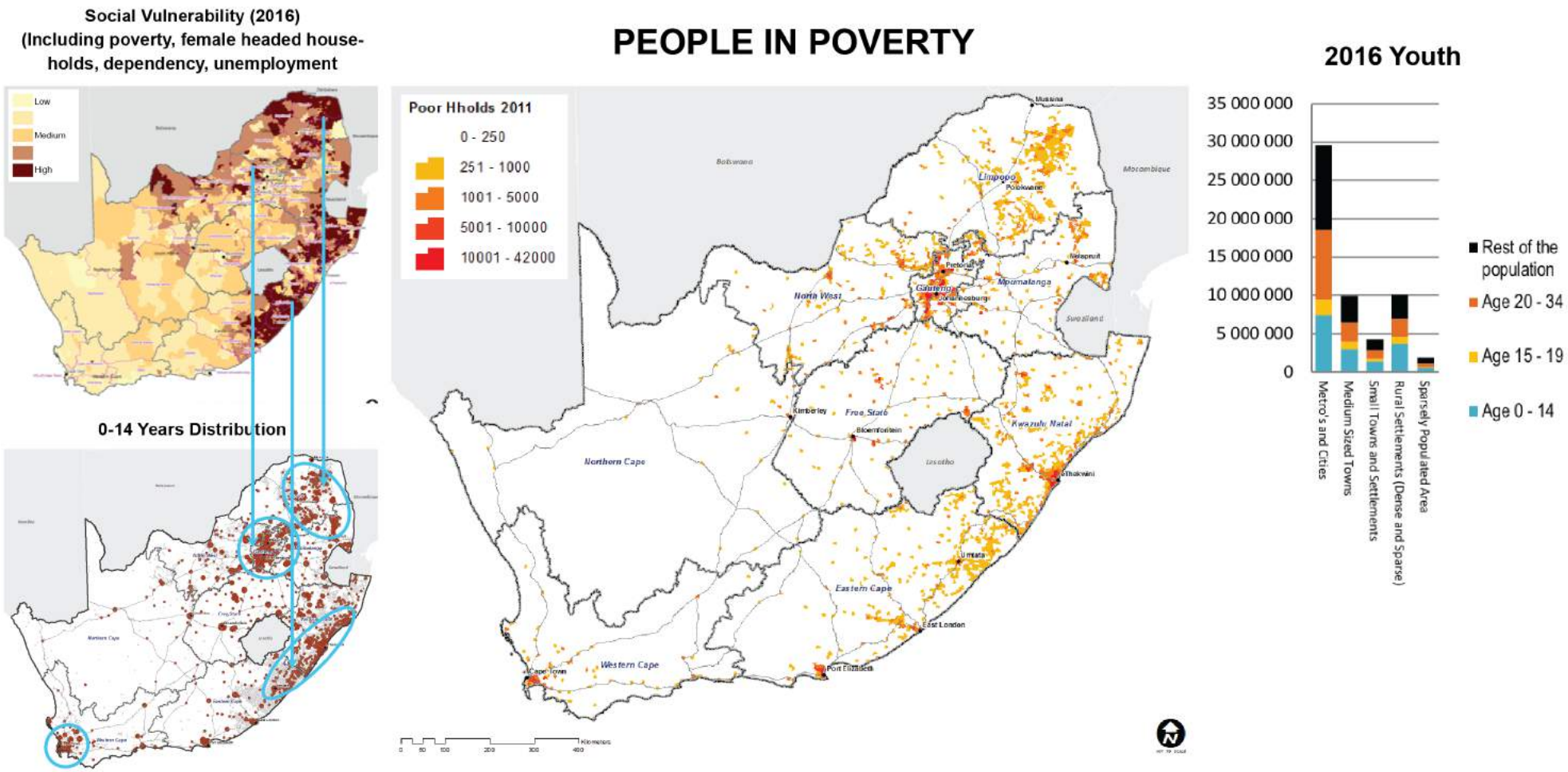
LAND USE STATISTICS

NATIONAL AREA	HA	% of SA	PEOPLE
Productive Use: Urban and Rural Settlement areas (CSIR Meso Zone, 7x7 land description, 2017) * Include High Capability Agriculture	13 451 600	11%	51 849 267
Productive use: Sparsely populated areas (CSIR Meso Zone, 7x7 land description, 2017) * Include High Capability Agriculture	51 572 400	42%	1 757 883
Arid zone (CSIR Meso Zone, 7x7 land description, 2017)	41 572 400	34%	668 702
Hyper-Arid Zones (CSIR Meso Zone, 7x7 land description, 2017)	632 900	1%	6 661
Mountains (CSIR Meso Zone, 7x7 land description, 2017)	2 556 200	2%	49 414
Protected Areas (DEA)	7 915 500	6%	829 652
Transfrontier Parks (DEA)	4 417 200	4%	630 533
TOTAL		100	

NATURAL RESOURCE FOUNDATION	HA	% of SA	PEOPLE
Stressed Catchments	15 548 697,85	12,75%	
Critical Bio-diversity Areas (SANBI, 2017)	NA	NA	NA
Strategic Water Source Production Areas (Water Research Commission Identified Areas 2017)	NA	8%	NA
***High Capability Agriculture (Mandala GIS, 2018 – Due to mapping process still being finalised by Department of Agriculture)**	3 055 734	2,51%	NA

OWNERSHIP	HA	% of SA	PEOPLE
State Land (DRDLR 2017) (Includes national parks and traditional areas)	21 195 968	17,38%	NA
Traditional Leadership Areas (DRDLR, 2017)	13 989 464,37	11%	NA

Figure 11: People and Places – Population Vulnerability



Population Characteristics and Settlement Dynamics Based on StatsSA, 2011; Quantec 2016, CSIR Town Typology 2018, Vulnerability and Migration Indicators – See Annexure A

3.3 Urbanisation, the Pursuit of a Better Life and a Desire for Quality Urban Living and Spaces

Urbanisation, meaning both (1) the movement of our people from rural to urban areas, and (2) the increase in the percentage of our population living in urban areas, will continue unabatedly throughout the three decades up to 2050. According to United Nations-estimates, "*… 71.3% of the South African population will live in urban areas by 2030, reaching nearly 80% by 2050.*" National population projections for medium and high-growth scenarios (considering population growth as well as international migration patterns) conducted to explore future climate change scenarios, illustrate the need to plan for at least a 30% increase in our urban population by 2050[vi]. In the same vein, the CSIR's *'Downscaled Settlement Locational Modelling-exercise'* projects that under *'a scenario with no radical intervention'*, approximately 85% of South Africa's population will be living in urban agglomerations by 2050.

Our three urban regions (Gauteng, Western Cape and eThekwini) will experience the largest increases in population – this being from natural growth, as well as in-migration from South Africa, SADC and further afield. Significant movement will also take place from villages and small towns to larger, better connected towns located on major transport routes where provision of better and more reliable basic services, education, healthcare and policing are, and will remain, important drivers of migration. However, while small towns and dense rural settlements are not expected to see a large population growth, *they are also not expected to see a significant population decline in either the medium-scale or high-growth scenarios for population growth in South Africa*. As such, both large urban regions and rural areas will require targeted and appropriate government focus and attention.

Given the presence of a young, educated, vocal and demanding *urban electorate* of around 65 million people by 2050, making good on the promise of a *better life for all,* will be a major concern for government. This will especially be the case in large urban regions, where these large populations will place huge demands on already over-burdened, collapsing and ageing municipal infrastructure. At the same time, these areas will need to rapidly increase their contribution to the country's formal economic output and tax income, and become (1) the sites of *'spatial transformation'* and *'drivers of inclusive and sustainable economic growth' at scale,* and (2) the incubators of *dynamic, creative, and innovative new economies.* Municipalities will not be able to carry this burden alone and will require significant financial and technical support from (1) national and provincial government, and (2) the private sector. Long-term planning for urban growth, including the identification of suitable land, land reform planning, land-use management, and the preparation of infrastructure master plans with full life-cycle costing, will be imperative.

Ways of urban life and living are also likely to undergo radical change, with urban inhabitants increasingly (1) seeking, finding and making ways of *making a life for themselves*, and (2) becoming far more involved in *making better quality urban spaces* in what will for most *be their only home*. This *'drive from below'* will be fuelled by (1) a *far more active citizenry,* in part driven by necessity, (2) a *much smaller* 'large-sized private sector', severely bruised by dwindling disposable household incomes and a slow-to-change capital-intensive business model unsuited to an increasingly-faster changing business environment, and (3) the *scale of the challenge* in relation to the State's finances and capacity to deliver services and assist in this regard. This 'drive from below' will also lead to a relaxation of bylaws and (1) far less petty and far more high-level land use regulations, enabling far greater levels of economic activity and agility, and far more organic and inclusive economic growth, (2) far greater diversity in economic activities, housing forms and tenure types, (3) far more horizontal and vertical mixing of land uses, (4) far higher settlement densities, and (5) far more vibrant and lively city streets.

The gaps in State service provision will very likely open up opportunities for entrepreneurial endeavour, notably in the provision of housing, water, energy, health care and education. The *greater availability of urban land for settlement, through urban land reform*, will also see a rapid increase in the number of new small-scale property developers. Altogether, these new forms of urban living and urban spaces will become the new drivers of innovation, creativity and *job creation and societal transformation from below* and cement large urban areas as the most important contributors to the South African economy. This will not only be done through the collective endeavours of millions of individual actors and small and micro-sized enterprises in the economy, but also by the contribution of innovative and agile large companies competing successfully in the global economy.

An increase in cross-border trade and the rendering of personal, financial, education and health services in *border-region towns*, will see an increase in movement by South Africans and citizens from other African countries, to such towns. Given the envisaged changes in urban areas towards places of *far greater vibrancy, diversity and respect for difference, and their global connectivity*, the *larger urban areas* will experience significant in-migration of people from primarily other African countries, but also from further afield.

In the *sprawling, dense rural areas* along (1) the eastern escarpment of the country in Limpopo and Mpumalanga, (2) the eastern KwaZulu-Natal and Eastern Cape coastal strip, and (3) the north-western mining and agricultural region running from the Northwest to the Northern Cape, the trend towards far greater densification in *nodes* and *along routes connecting such nodes,* will continue and result in *far more concentrated development* and the *release* of agricultural land for productive use in these areas.

Smaller towns in rural areas will also experience sizeable counter-urbanisation, as growing numbers of retiring middle-income South Africans from urban areas will settle for more tranquil lives in the rural parts of our country. This will, in many such settlements, facilitate (1) the construction and upgrading of houses by individuals and families for this anticipated retirement stage, as well as (2) the tailor-made development of housing units catering for this older population in such towns, which will support the growth of a new generation of small-to-medium sized property developers in these towns. The injection of the regular pensions of these new, retired inhabitants will also (1) stimulate the local economy, by creating a new market for local produce and personal and social services, notably the provision of health and frail care services, and (2) provide valuable and stable municipal rates and tax incomes. This move to rural South Africa will also be strengthened and facilitated in many villages and smaller towns by the rapid release of land in such towns through the *national land reform programme*.

Quality urban living in both urban and rural areas will require just and sustainable access to social services. The provision of such services (1) requires investment in 'social infrastructure', i.e. '*high-quality facilities that are well-equipped, maintained and operated, and staffed to the correct level by well-trained personnel who provide a range of critical social services to the community'*, and (2) include *the full spectrum* of health and education services, citizen registration, welfare support, cultural and sport and recreational facilities. While no comprehensive overview of backlogs in the provision of these services is available at national level, local case-studies show critical shortages and grossly inadequate service delivery in both rural and urban areas. These include (1) poor maintenance of buildings, (2) a shortage of equipment, and (3) critical staff shortages, especially with respect to well-trained and dedicated staff. The projected national population increase to 75 million people by 2050, however, not only means expanded requirements for social facility investment and operation, but also (1) *presents an opportunity for meaningful employment in rural towns,* and (2) if properly planned and provided, can act as a highly effective and sustainable economic multiplier. The importance of spatial planning to guide targeted social infrastructure investment can, however, not be over-emphasised – *establishing a sound spatial-location-logic that optimises human capital*

development with economic impact, is imperative to address inequality and ensure inter-generational justice.

3.4 Ruralisation and the Need for Decisive and Sustainable Rural Development and Agrarian Reform

Currently more than 17 million of our people are estimated to be living in rural settlements across dense and sparsely populated regions – mainly in the former Bantustans. Most of these people live in conditions of severe poverty and vulnerability. Research on these conditions shows that '*… the deprivation gap between those living in the former homelands and the rest of the country has not narrowed in the period between 2001 and 2011',* meaning that well-intended investment and rural development initiatives for over a decade or more have not significantly changed this picture of relative deprivation in these areas[vii].

However, after (1) hundreds of years of *colonial and Apartheid* oppression, exploitation, disregard and calculated under-investment, (2) followed by decades of uncoordinated and fragmented investment by *successive post-Apartheid governments* in rural South Africa, these areas are finally getting the recognition, respect and focused 'development attention' they deserve and have been promised since 1994. This trend towards *taking rural areas seriously* is set to continue and become stronger over the next three decades, as rural areas become recognised as parts of our country that are (1) *areas of national significance* for surface water and food production and the provision of key national ecosystem services, (2) *still 'home'* to millions of South Africans, many of them highly vulnerable and isolated from the broader national economy, (3) *places of retreat, rest and connection with nature and cultural practices,* far away from fast-paced urban lives, and (4) *sought-after domestic and international tourism and retirement destinations*. In terms of State action, focused rural development is set to find expression in (1) targeted agrarian reform, (2) tenure reform, (3) the development of agri-processing and logistic support-hubs, (4) diversification of the local economy, (5) small-town redevelopment and regeneration in accessible locations, (6) public works-led job creation programmes and the roll-out of core government social and municipal services, and (7) the provision of grant support with the building and upgrading of housing, specifically in identified *regional development anchors* and *rural service towns*.

Of crucial importance to the realisation of the desired rural development objectives is *rural land reform*, which will release vast amounts of under-utilised commercial agricultural and State-owned land for use by new entrants to the farming sector, and give the resurgence and upliftment of rural areas a huge impetus. The *new rural economy* will, however, necessitate the development of a very different local economy in those towns built up over generations and sustained by a model of either large-scale commercial agriculture or subsistence agriculture. New agriculture support entities, cooperatives, equipment, fertilizer, market support, funding and research will need to be introduced in towns in rural areas *to support a new type of farmer.* Municipalities, who will have to ensure new and appropriate land management in such areas, may also be expected and/or called upon to assist new role-players in the local economy with establishing new agricultural and non-agricultural-related economic activities. In this, they will require very specific support from the national and provincial sector departments responsible for agriculture and rural development, who will themselves also have to take on new roles in the light of *the new dawn in rural South Africa*.

Rural communities will increasingly also demand better levels and higher speeds of connectivity, both by road and rail, and by broadband. At the same time, demands will be placed on government for the provision of quality social, education, health and police services, placing significant pressure on what will, for at least the next decade, be a severely

constrained fiscus. As alluded to earlier, it is imperative that such services be provided in *such places* and in *such a manner* that they (1) have the greatest impact, and (2) are able to service the greatest number of inhabitants. In deciding on sites/locations and service-mixes, the focus should be on serving (1) the youth, and (2) those inhabitants who will elect to retire in rural areas, and who will spend significant amounts of money during their working lives on building and/or maintaining their retirement homes.

3.5 Natural Resource Limitations, a Move Away from Ecosystem Destruction, Pollution and a National Water Security Crisis

Over the last few years, the majority of ordinary South Africans citizens were rudely awakened to the reality that South Africa is a water-scarce country, and not one merely struck or frustrated by occasional droughts. While we have for many years been able to transfer water between *catchments with a surplus* to *areas with a deficit,* and maintained the myth of water-abundance, the reality is that the model has run its course and that we no longer have sufficient water left in the system to redistribute if we continue to use water as we did in the past. We will have to employ technology to (1) supplement our water supply, (2) reduce our use, and (3) better manage and distribute piped water.

Should we, however, choose to continue along the economic trajectory that disregards our natural base, and continues to incur huge damage to our natural resources, we will in the very near future become even more aware of, and be confronted with the following realities: (1) dwindling water security and availability, wetland destruction, severely disrupted water catchments and over-utilised and polluted groundwater sources, especially in our mining and commercial agricultural productions areas; (2) highly contaminated and toxic waterbodies and waterways; (3) toxic levels of air pollution through highly noxious industrial activities and the generation of energy through coal-fired power stations; (4) the loss of the very small extent of high-value agricultural land we once had; (5) irreparably damaged ecosystems and loss of the services they provide for all forms of life; and (6) a long and rapidly growing list of extinct species. Furthermore, we will be confronted with the reality that our continued pollution of rivers and streams, soil, air and the oceans around us, is not compatible with our plans to (1) grow our tourism sector, (2) expand our agricultural and agro-processing activities, and (3) make far greater use of the oceans economy. As a country, we will be asked to make hard choices, such as between (1) an environment that sustains us and is not harmful to our lives, and (2) the economic activities and national income that comes from exporting and burning dirty carbons, like coal, and irresponsible, callous and wasteful resource use.

Turning away from this looming ecological disaster will require that *trade-offs be made* at the *national level* between (1) noxious and polluting economic activities, and (2) ecosystem health and integrity. At the same time, water demand management, and the behavioural changes and enforcement protocols that emanate from this, will need to be introduced, policed and enforced at *municipal level.* Irreplaceable natural resources of national significance, irrespective of where they are located, will need to be acknowledged, demarcated and treated as such, so that they can contribute to the well-being of all citizens. Municipalities will have to focus far more so in their land use management functions on protecting such areas, and promote compatible and productive uses that contribute to environmental management and restoration goals.

Likewise, sustainable land development and intergenerational spatial justice will require effective land administration and management, civil society custodianship and strong and efficient governance. This will only be possible if (1) municipal land use management systems are in place,

and (2) municipalities are staffed with competent, dedicated and caring town planning officials and councillors, who cannot be corrupted and who have the will and mandate to act. In addition to this, rehabilitation of degraded land in stressed and degraded catchments (including former mining areas) will need to be done. Mining companies must be held accountable to clean up what they polluted, and regulations in this regard rigorously enforced. Mediation of the fall-out in terms of jobs tied to polluting mining and industrial activities that are distractive of the ecosystem will have to be done, and job creation in ecologically less-damaging sectors (1) planned for well in advance of mine closures, and (2) actively and adequately provided for.

3.6 Climate Change Implications, Regional Adaptation and Mitigation

Climate change is set to have far-reaching impacts on our country, notably with regards to temperature and rainfall patterns. *Temperatures are set to increase* by *between 1 and 4 degrees Celsius* between now and 2050, in primarily the western and north-western parts of the country, while the number of very warm days is set to increase in an equally wide band across the country. *Rainfall is set to decrease in a large stretch of the south-western, western and north-western parts of the country*, while rainfall is set to *increase, but also become more erratic in the central and south-eastern part of the country*. These climatic changes will not only have severely detrimental impacts on the highly productive agricultural activities in the western and north-western parts of the country. The towns in these areas, of which most rely heavily on these agricultural economies, will be equally hard-hit, and their residents required to make far less use of water for domestic and economic consumption to keep the agricultural activities going.

Climate change impacts will also render significant parts of the country increasingly hostile to human, animal and plant life, and hard to live in. In addition to this, the likelihood of more veldfires is set to increase, especially so in vast and remote rural areas where municipal services are already thinly spread, and the State's capacity to *deal with such disasters* is generally weak. While some of the central and eastern parts of the country may experience more rain, *the equally greater degree of uncertainty and intensity of the precipitation will not be conducive to traditional conventional agriculture*. Sudden downpours may lead to (1) a greater loss of top soil, and silting up of dams and water canals, and (2) the destruction of rural roads and infrastructure. In urban areas, such sudden and severe downpours could lead to flash-flooding, loss of life and destruction of municipal infrastructure, buildings and property, especially so in cases where these are not well-maintained. In many of our urban areas, it is especially *the poor, vulnerable and marginalised inhabitants* who live in poor housing that is not well-located, and who are generally not insured, that will disproportionally suffer the impacts of such disasters.

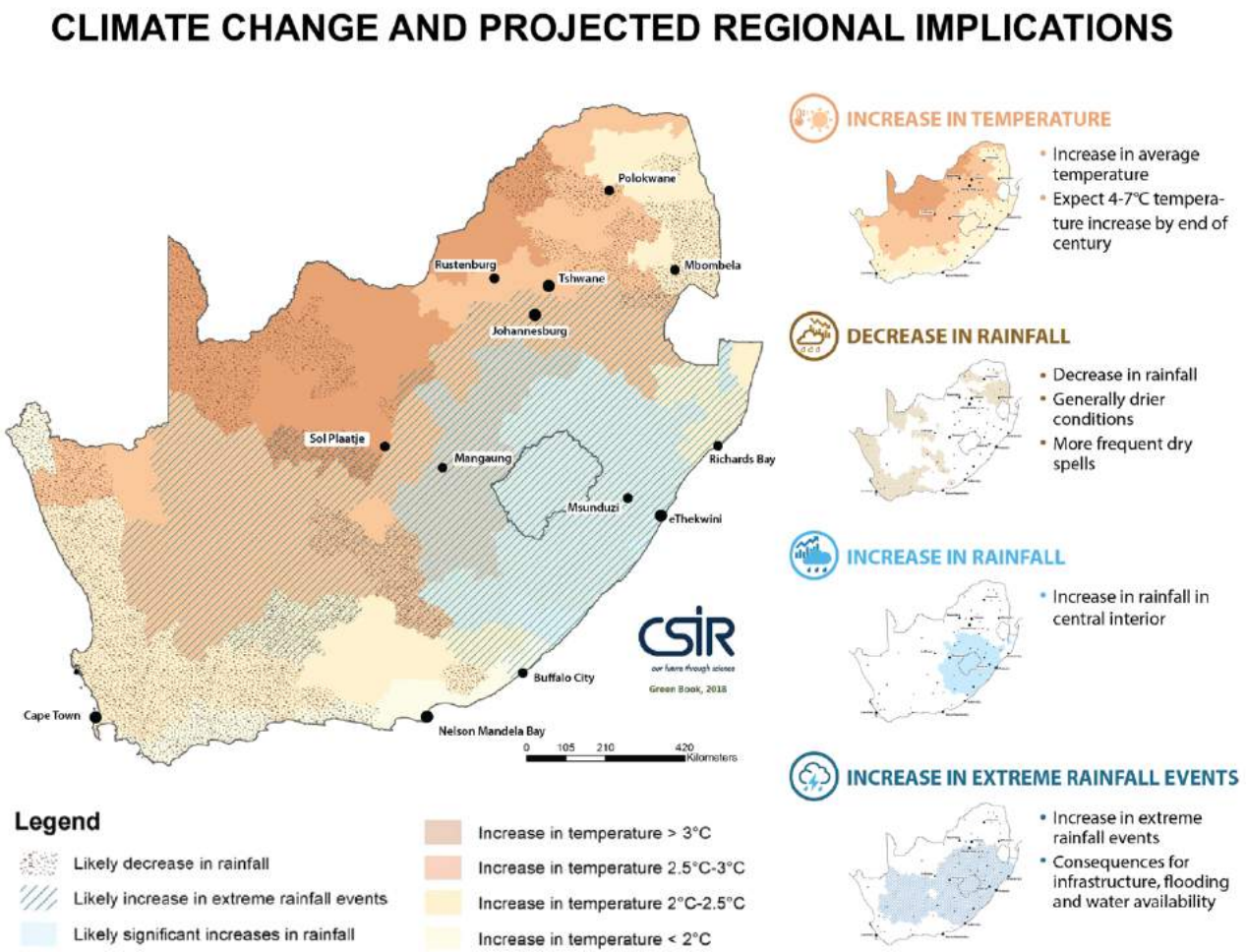
In terms of *national land use and settlement patterns*, climate change begs serious questions with regards to future human settlement in national space, such as: How will climatic change impact regional development patterns in terms of temperature, liveability, water, food security and the adaptation to viable agricultural practices and commodities? What kind of impacts can be expected in settlements and *where should new cities be built, and with what population-size in mind?* What are the disaster-risk reduction interventions, coping-capacity and national resource implications, e.g. drought relief, that are required in areas that are set to experience significant and intolerable changes in climate: Should high-risk settlement development for instance be curbed, will government be able to provide support for the most vulnerable and if so, of what kind and at what cost? Furthermore, what kind of activities and settlement patterns should be allowed in such

areas, and *should new settlement development in these areas be discouraged, or concentrated in alternative, carefully selected suitable locations?* Questions around regional adaptation includes consideration whether directing or discouraging urban and settlement in certain regions is constitutional, and if so, what kind of method or measure to regulate settlement in such areas would be used?

The higher levels of discomfort in the interior of the western and north-western parts of the country may also trigger migration from these parts to areas with better climates, notably the (1) eastern interior and (2) eastern and southern coastal belts. The *eastern coastal belt and eastern escarpment* is, however, the part of the country (1) most suitable for food production and surface water-capture, and (2) in which traditional land tenure systems currently prevail. These are also areas in which the dreaded land-related legislation of the colonial and Apartheid eras have left deep scars, both on *the people*, and *space,* in the form of limited access to land, over-grazing and erosion. Given the urgency of the matter from a *national perspective*, and the challenges that will be encountered, it is of crucial importance that *'a national spatial climate-mitigation plan'* be prepared, with (1) participation of all role-players involved, and (2) strong spatial planning, ecosystems and land-use management components.

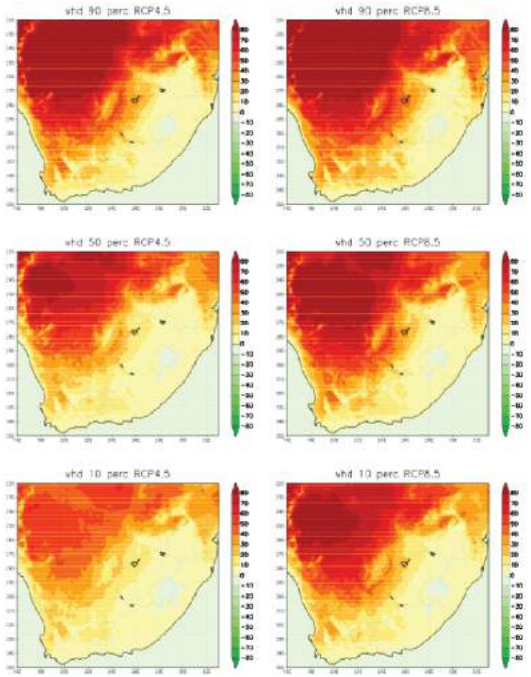
In addition to this, climate change is also set to have severely negative impacts in terms of temperature increases and lower rainfall figures in *countries to the north of South Africa,* and up into central Africa. These changes could potentially lead to large-scale in-migration of 'environmental refugees' from such countries to amongst others, South Africa. Thus, South Africa will both (1) need to be prepared, and (2) our national space be planned with such eventualities in mind, to avoid the kind of antagonism and open hostility that refugees from Africa, the Middle East and Asia are increasingly experiencing in parts of Europe.

Figure 12: Ecologies, Economies and Spaces – Climate Change and Projected Regional Implications



Climate Change Modelling and scenarios developed through CSIR, Green Book-project, 2018. See Annexure A

For the period 2021-2050 relative to 1961-1990, under low mitigation, very hot days are projected to increase with as many as 40-60 days per year in the Limpopo river valley, and 70 days per year in parts of the Northern Cape, North-West, Orange River Valley



CCAM projected change in the annual average number of very hot days (units are days per grid point per year) over South Africa at 8 km resolution, for the time-slab 2021-2050 relative to 1961-1990. The 10th, 50th and 90th percentiles are shown for the ensemble of downscalings of six GCM projections under RCP4.5 (left) and RCP8.5 (right) (CSIR, 2018a).

Figure 13: Ecologies, Economies and Spaces – National Ecological Infrastructure

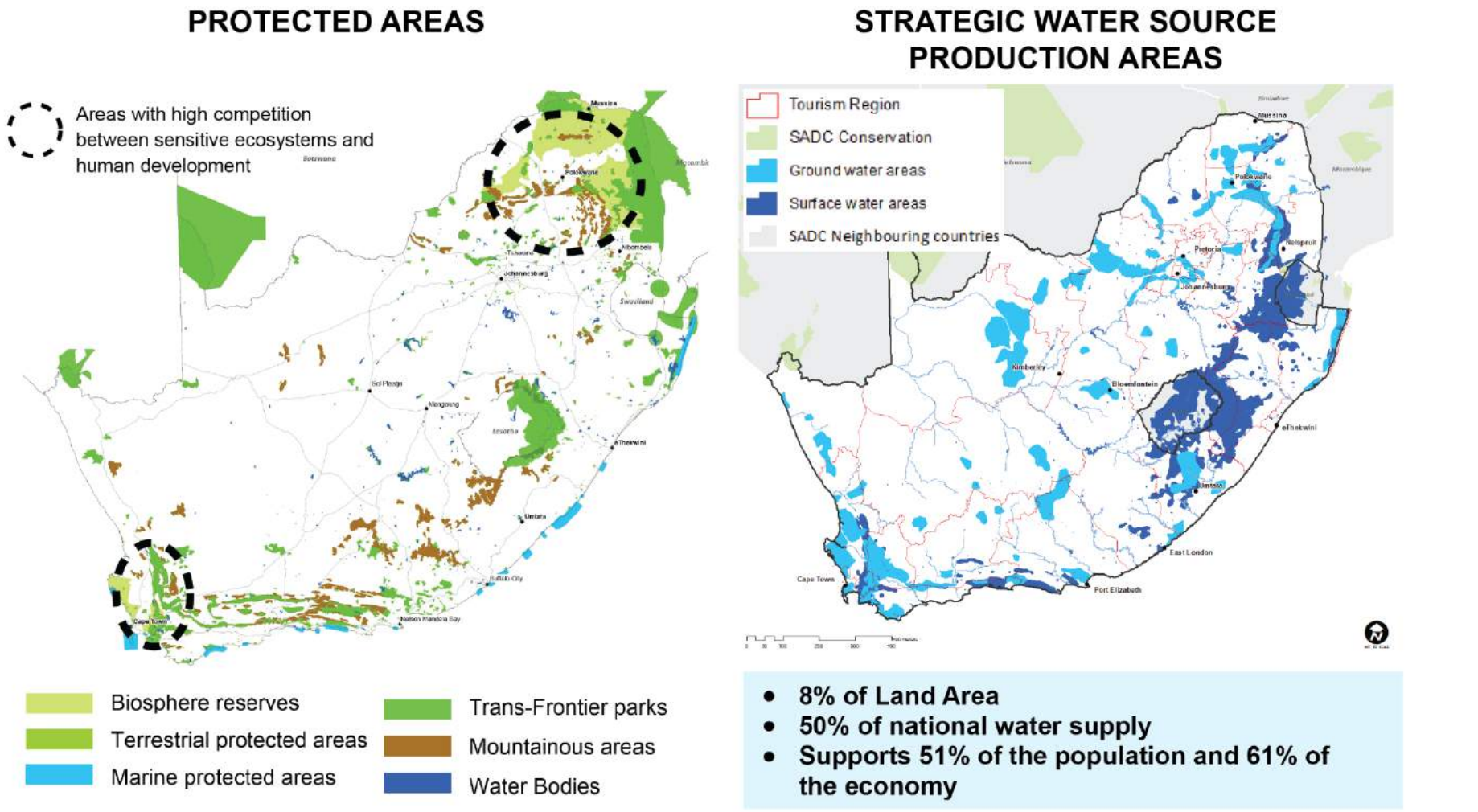


Figure 14: Ecologies, Economies and Spaces – Ecological Infrastructure, Interdependence and Threats

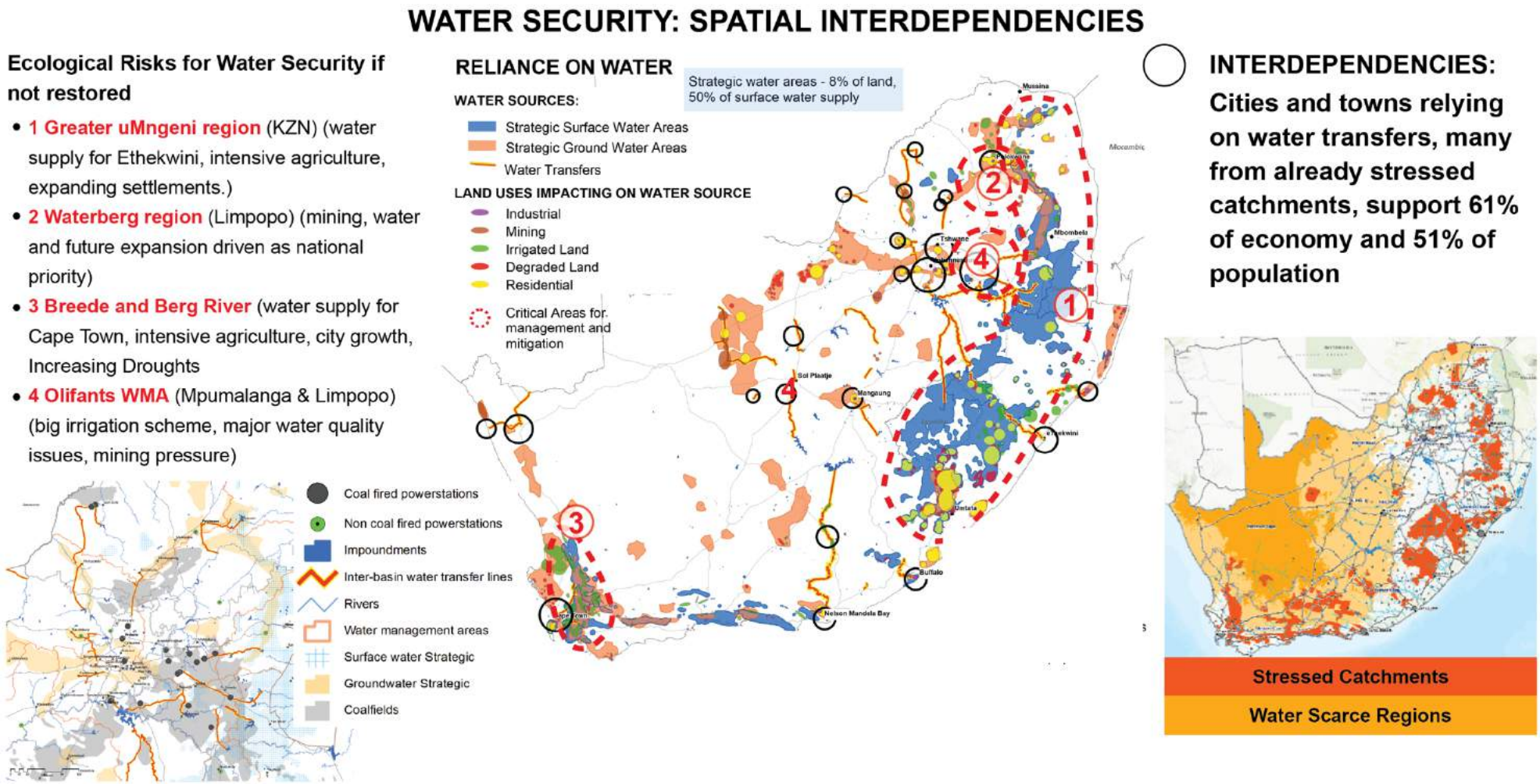
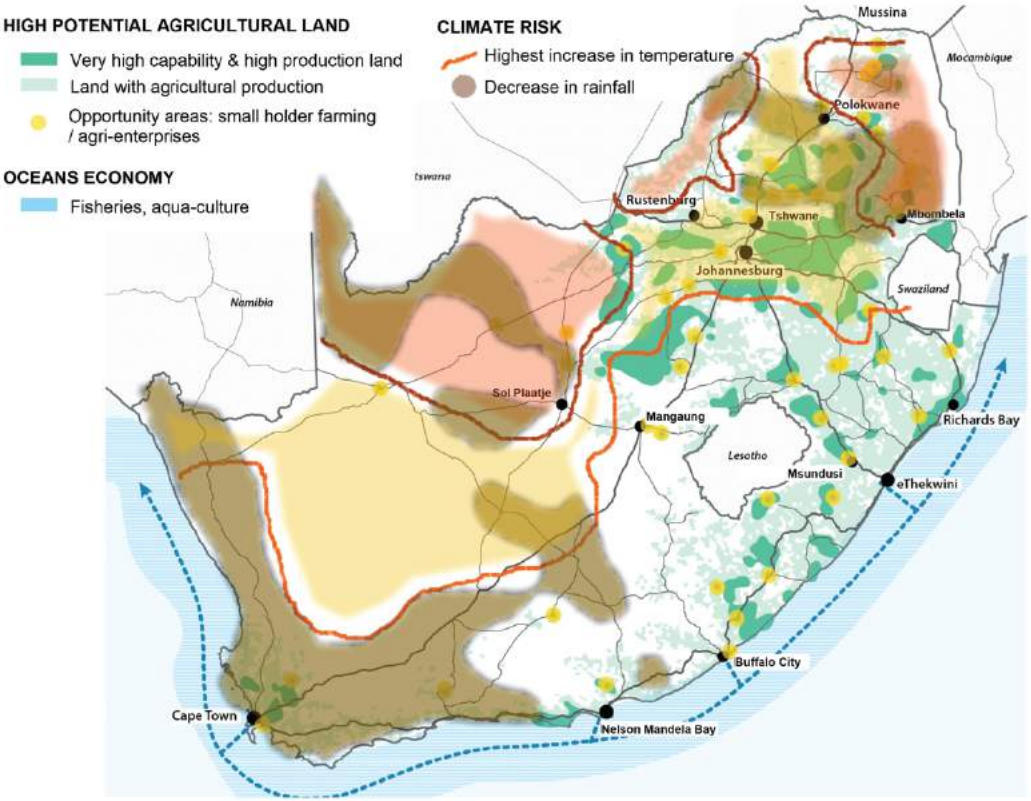
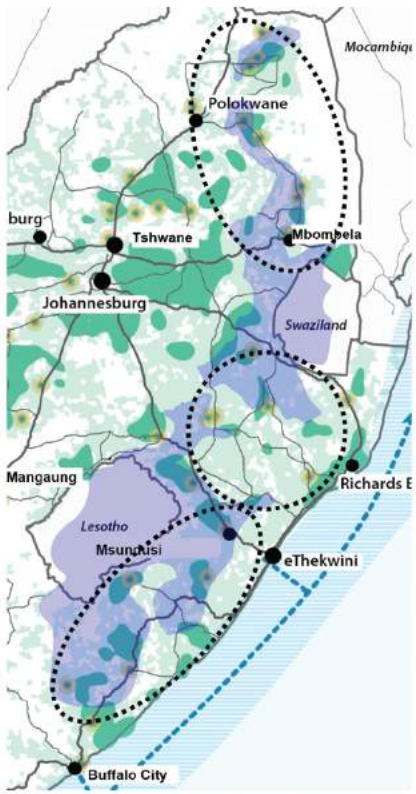


Figure 15: Ecologies, Economies and Spaces – Supporting Ecological Infrastructure

FOOD SECURITY: SPATIAL INTERDEPENDENCIES



CRITICAL ROLE OF DENSE RURAL



The development of these dense rural areas in a sensitive manner, including better land use management and addressing unresolved issues of land tenure, is a priority.

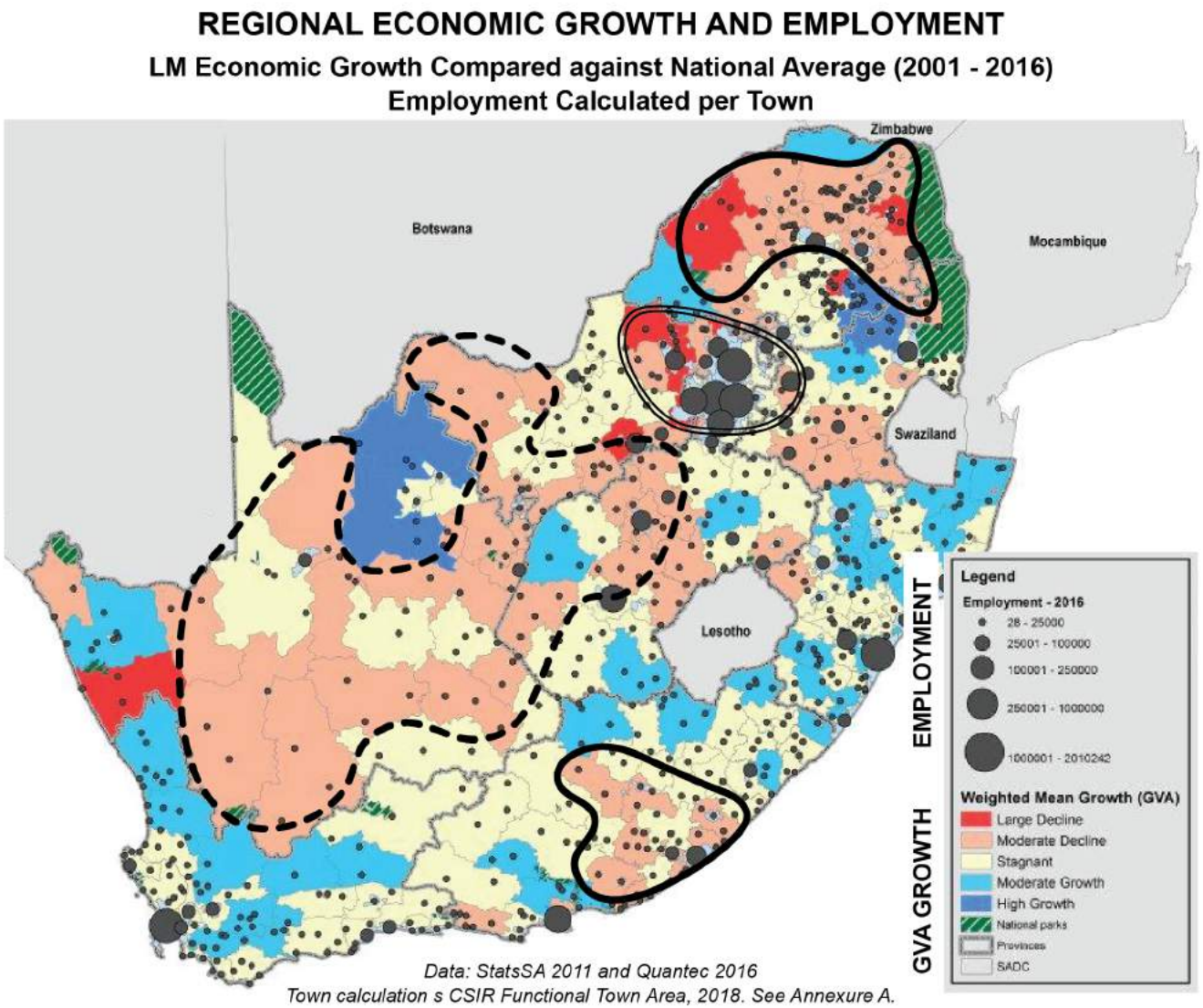
Consideration will have to be given to the establishment of a more concentrated land use pattern, with more consolidated land being available for small scale and high-intensity commercial agriculture.

At the same time, the economic opportunities inherent in the productive capacity of the area, should not be negated.

CRITICAL RESOURCE AREAS

- Very high capability & high production land
- Land with agricultural production capability
- Important water source areas
- Dense rural settlement areas

Figure 16: Ecologies, Economies and Spaces – Regional Economic Trends



SIGNIFICANT REGIONAL ECONOMIC TRENDS

The mining dependent economies in the area of slow growth and absolute decline around the Gauteng City Region. Mining production in the area around the metro's declined from 7% of the national Mining output in 1996 to 3.86% in 2016. Unemployment increasing whilst region will continue to face population growth.

The Bigger Karoo Region, where temperature increases and water security create increasing risks for large number of vulnerable local economies.

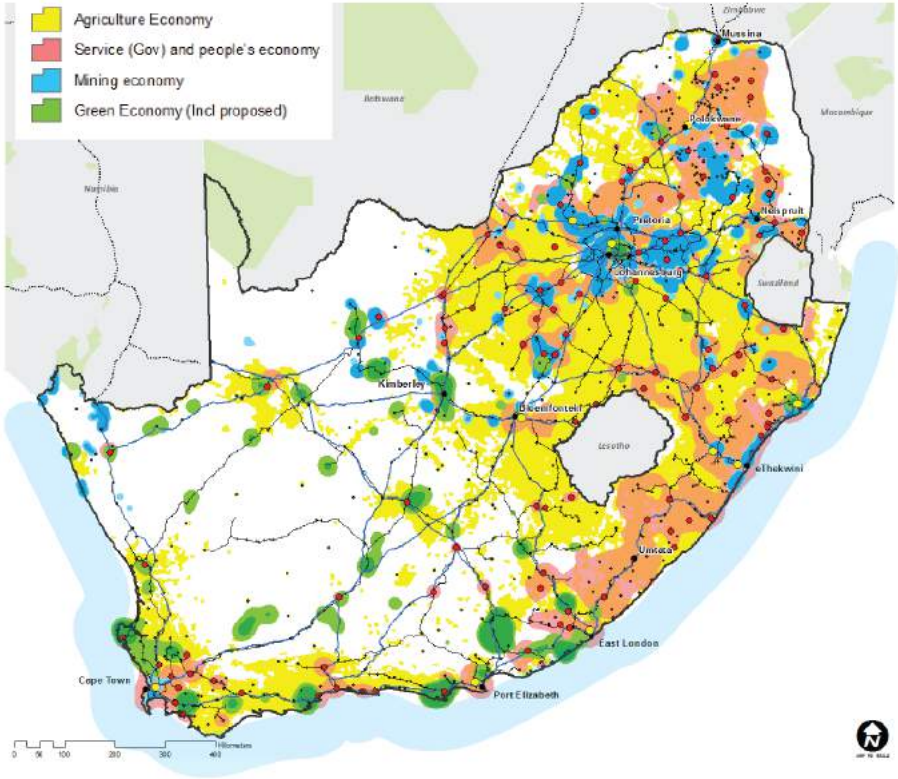
Densely settled areas where employment vulnerability is very high and where population growth exceeds economic growth.

Large and growing urban regions with stagnant economies and low employment growth

Figure 17: Ecologies, Economies and Space – National Economic Production and Employment Trends

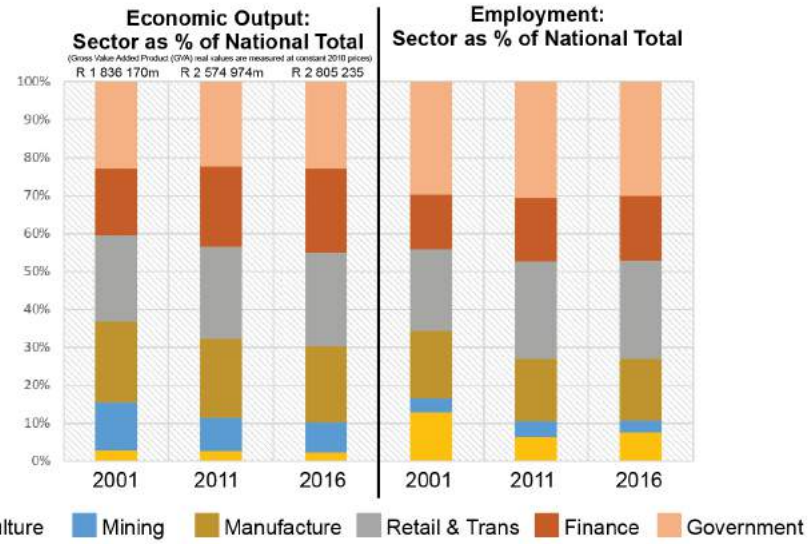
SPATIAL REPRESENTATION OF ECONOMIC PRODUCTION IN SA (2016)

Nodal Agglomeration (Largely Retail and Trade, Finance, Government Services) and Manufacturing Related Sectors) and Rural Resource Economies (Agriculture, Mining, Energy production, Oceans)



Data: StatsSA 2011 and Quantec 2016. Spatial indicators based on CSIR Mesozone 2017, See Annexure A. Integrated National Export Strategy (INES): "Export 2030". the dti.

NATIONAL ECONOMIC OUTPUT AND EMPLOYMENT TRENDS (INCREASINGLY NODAL)



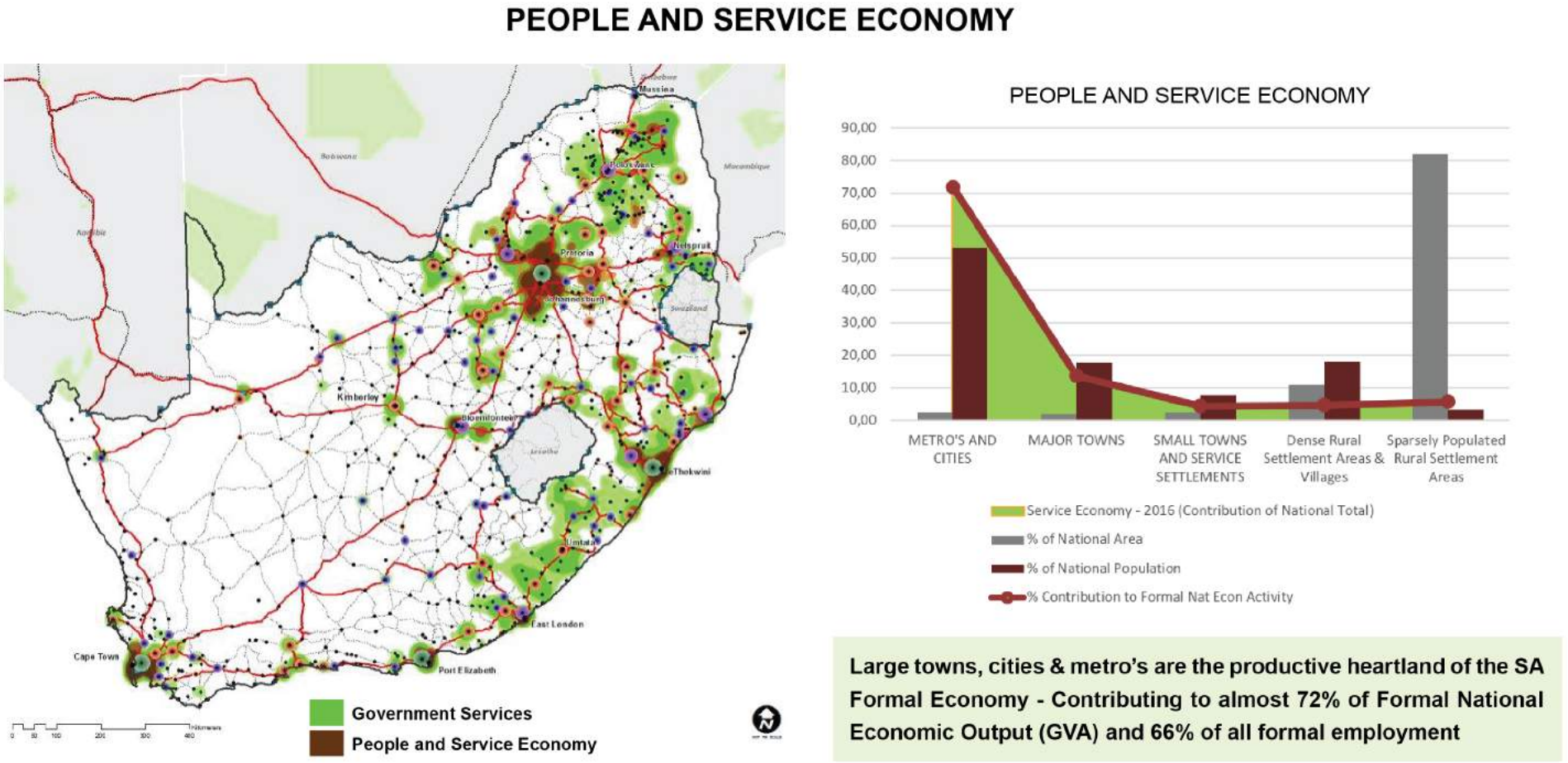
IDENTIFIED COMPARATIVE ADVANTAGE FOR EXPORTS: FUTURE FOCUS AREAS (INCREASINGLY NODAL AND DISTRIBUTED)

- Agriculture and forestry; agro-processing; organics and natural ingredients; biotechnology; fertilizer and pesticides; aquaculture; leather and leather products;
- Mining and beneficiation, including capital equipment
- Petrochemicals; transport and storage; machinery and equipment; and energy; Automotive; petrochemicals and biofuels; clothing and textiles;
- Financial and business services; Pharmaceuticals; Information communication and technology (ICT)

NATIONAL SIGNIFICANCE OF SERVICE SECTOR (LARGELY NODAL)

- Government & service sectors expected to continue to play in future

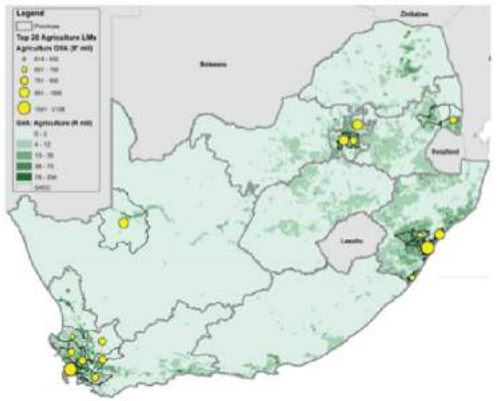
Figure 18: Ecologies, Economies and Spaces – People and Agglomeration Economies in Polycentric Network of Cities and Towns



Data: StatsSA 2011 and Quantec 2016. Spatial indicators based on CSIR Mesozone 2017, Functional Town Area, 2018. See Annexure A.

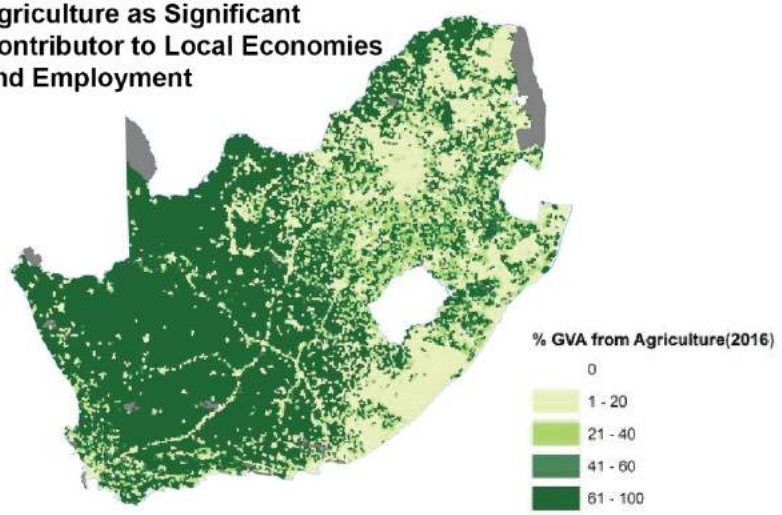
Figure 19: Ecologies, Economies and Spaces – Agricultural Resource Economy and Food Production

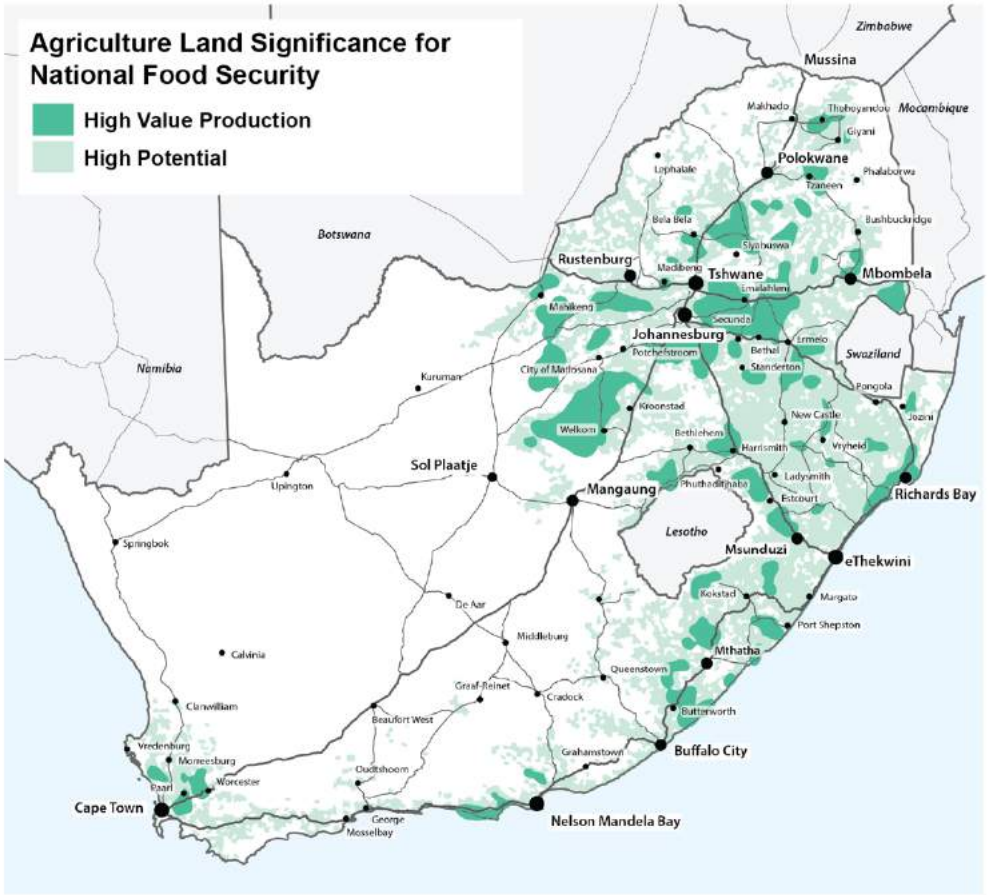
Agriculture as Significant Contributor to National Economies & Sector Employment



20 Top Agriculture Production Areas: 36% of National Agricultural Output, 30% Employment in Sector 2016

Agriculture as Significant Contributor to Local Economies and Employment





Identified areas of high and moderate land capability, high potential for agri-resource enterprise development - Considering a) crop fields from the National Department of Agriculture as well as b) land capability Updated by National Department of Agriculture.
Data: StatsSA 2011, 2016 and Quantec 2016. Spatial indicators based on CSIR Mesozone 2017, See Annexure A.

3.7 Land Reform

Irrespective of the final wording of the amendment to Section 25 of the Constitution specifying the conditions in terms of which the State may expropriate land without compensation, land reform will see a rapid expansion from its current form and its performance to date, *both in urban and rural South Africa.* In accordance with the intention to address colonial land and livelihood dispossession and injustice, Black South Africans will either get (1) *secure tenure and land use rights*, or (2) *full title to land,* and the *grossly unbalanced land ownership profile,* by which the bulk of commercial agricultural land in the country is held by White South Africans, will be radically reversed. As such, land reform is set to have a huge impact on (1) national land-use and land-ownership patterns, (2) national settlement development, and (3) the national space economy.

In *urban areas,* land reform is sure to involve the identification of '*suitable land for making a life, and quality urban life and living',* i.e. land that could (1) ensure infill development, (2) bring about greater social and economic inclusion, (3) unleash new economic opportunities, and (4) enable a far greater segment of the South African population to own and lease property, and have access to the amenities and qualities of urban living. In addition to this, the provision of land for economic activities and property development in urban areas to Black South Africans previously excluded from such opportunities, will also assist in bringing far more new and emerging actors into the economy, and assist in *breaking the back of the deeply monopolistic, concentrated and elite-controlled nature of the South African economy*. At the same time, urban land reform may assist in making available sites for (1) unleashing new *opportunities in under-valued economies in our urban areas*, such as the optimisation of the *cultural industries, entertainment, food preparation, and service and small-scale manufacturing and repair activities*, and (2) facilitating the *functional integration of urban South Africa* into a functional national economic innovation, inclusion and transformation system. This will, however, *require of municipalities* to gather the necessary information and keep up-to-date records of all land parcels in their areas of jurisdiction that are (1) strategically located with regards to urban economies, (2) underutilised, (3) vacant, and/or (4) kept for speculative purposes only. It would also require *decisive action* and the limiting of time-lags between land acquisition, release, development and utilisation.

In *rural areas,* information such as (1) land ownership, (2) the condition of the land and soils, (3) the carrying capacity of the land, (4) the availability of water on the land, (5) accessibility, (6) the quality of fences and roads, and (7) anticipated exposure to climate change, would be important considerations. As in urban areas, limiting the time lag between land acquisition and utilisation will be of the essence. Care would also need to be taken to *mediate the impacts of changes in rural economies, notably in small towns* built up on the back of, and reliant on (1) large-scale commercial agriculture and large farmers, and (2) their related market, financial and personal services, daily supplies, education, health care and fertilizer needs. At the same time, engagement will need to take place on the matter of *tenure in communal land-areas,* and the utilisation and sharing of such land in the '*ecological sweet spot'* of our country, i.e. the *eastern coastal belt and eastern escarpment,* for food production, surface water capture and provision of key ecosystem services.

3.8 Dependency on Natural Resource Extraction and Related Economic Activities

Currently, our national economy is heavily natural resource-extraction based, with mining and coal-based energy generation key contributors to our national GVA. The NDP supports a move away from coal-based energy generation in line with international trends and climate protocols. Long-term spatial and infrastructure planning must be cognisant of this

move, and a *collectively and carefully planned, well-communicated and stakeholder-sensitive transition* – including the social, spatial and economic mitigation of the sure-to-be-significant impacts of the move – be undertaken.

While currently still of enormous importance, mining is set to shrink in terms of its contribution to the national economy, and undergo a radical change in terms of employment levels in the light of automation and possible disruptions in the demand for certain commodities, such as *coal and platinum*. The *move away from platinum* is tied to (1) an increased search for and use of cheaper alternatives, (2) far more recycling of the metal, and (3) most importantly, the global move away from diesel cars, of which most use platinum in their catalytic converters. While (1) the use of *palladium* – another member of the Platinum Group Metals (PGMs) – in the catalytic converters of petrol cars (following on from the turn away from diesel) may offer some short-term respite, and (2) the use of *platinum* in the hydrogen fuel cell-industry may hold out some longer-term hope, there is a very real likelihood of the PGMs industry seeing serious shrinkage in the not too distant future. Should this happen, it would *hit our economy very hard* in at least three ways: (1) a much smaller demand for platinum, which could lead to en masse platinum mine closures and job losses; (2) a greatly reduced demand for diesel-powered vehicles, which could hurt our local car manufacturing industry (with its strong emphasis on diesel cars) severely; and (3) a greater demand for electric cars in which we have not invested as a country, coupled with a focus in new mining exploration-activities on metals required for electrical cars, which we are not world-leaders in.

Areas where the coal and platinum mining sectors form the backbone of the local economy, especially insofar as local employment is concerned, will have to be *supported to transition* towards more diversified, sustainable economies. In places where (1) climate change, and (2) the lack of, or limited number of opportunities mean that there are no viable economic alternatives to mining, *resettlement to places with viable, sustainable economies* will need to be (1) planned for with the full participation of all stakeholders, and (2) effected with the utmost degree of circumspection.

3.9 Technology, Innovation, Resilience and Disruptions in the Space Economy

While this is a fertile field for speculation, there is far less clarity as to what this shaper will entail and how it will play out in countries, cities and rural areas throughout the world. What is increasingly clear is that (1) *communication* will become faster, more affordable and more accessible to all; (2) *urban areas,* notably large urban areas, with their potential for human-to-human service-based economies, dense institutional networks and higher education, innovation and research centres and institutes, will remain, and become even more significant players in this/the new economy; (3) *automation, robotics, and machine learning* is upon us, and will cause major disruptions in the world of work and will leave very few occupations unaffected, with some areas of work, such as dangerous and physically draining work in the mining industry at least being a thing of the past; and (4) those who *have higher levels of education* are more likely to manage, utilise and gain from the transitions than those with only rudimentary levels.

With regards to national spatial development, South Africa should see (1) the roll-out of lightning-fast broadband access throughout the country within less than a decade, (2) the advent of highly automated mining activities with far fewer on-site jobs, which can be sustained by "*fly-in-fly-out*" modes of operation, and hence not require the establishment of 'mining towns' as in the past, (3) automation in economic sectors that are currently regarded as major creators of employment, such as manufacturing and agriculture, thus leading to a reduction in

employment and job creation in areas where it would be sorely needed, notably rural South Africa, and (4) closures of factories and mines in South Africa that are unable to compete globally, leading not only to job losses in towns dependent on those sectors, but also a general contraction in retail and economic activities in affected municipalities.

In order to ensure that the country is not left behind, the following are imperative: (1) the *roll-out of broadband* throughout the country, first to the most densely populated areas, and thereafter the more sparsely populated areas; (2) the prioritisation of well-functioning, *key national road and rail networks* to ensure the creation of a densely integrated functional national economic system; (3) a focus on *innovation and knowledge generation, codification, packaging and sale;* (4) the expansion, modernisation and re-gearing of the *higher education sector* towards growing and supporting innovation and the entertainment, cultural and creative industries; and (5) the *nurturing of all South Africans, but especially our youth,* by ensuring proper nutrition, a safe, secure and pollution-free environment, quality health care and meaningful, life-long learning, to ensure that they are, and remain fully prepared for the dynamic world they will be living in. In addition to that, if well-used, the new technologies, given their (1) ease of access, and (2) disruptive qualities, should be of assistance in *breaking down the monopolistic nature of the South African economy*.

For *urban areas* to play the role that they can and must, 'public city space' will have to be optimised in terms of its ability to attract and grow informal activities linked to information, communication and technology services. This will in itself ask (1) *less of* a focus in urban economic and spatial development plans on large-scale 'nodal developments' with flashy high-rental shopping malls and office blocks, and warehouses filled with imported goods, and (2) *more on* new technology-assisted and enabled, small-and-medium-sized eco-agro-industries, manufacturing and cultural activities, and innovation. Should South Africa not succeed in surviving the disruptions and transitions coming our way, it will most likely lead to (1) the creation of new inequalities, (2) further fragmentation, and (3) more and deeper gaps between the rich and the poor, followed by more crime and even more barricaded property developments.

Figure 20: Movement, Connections and Flows – Connectivity

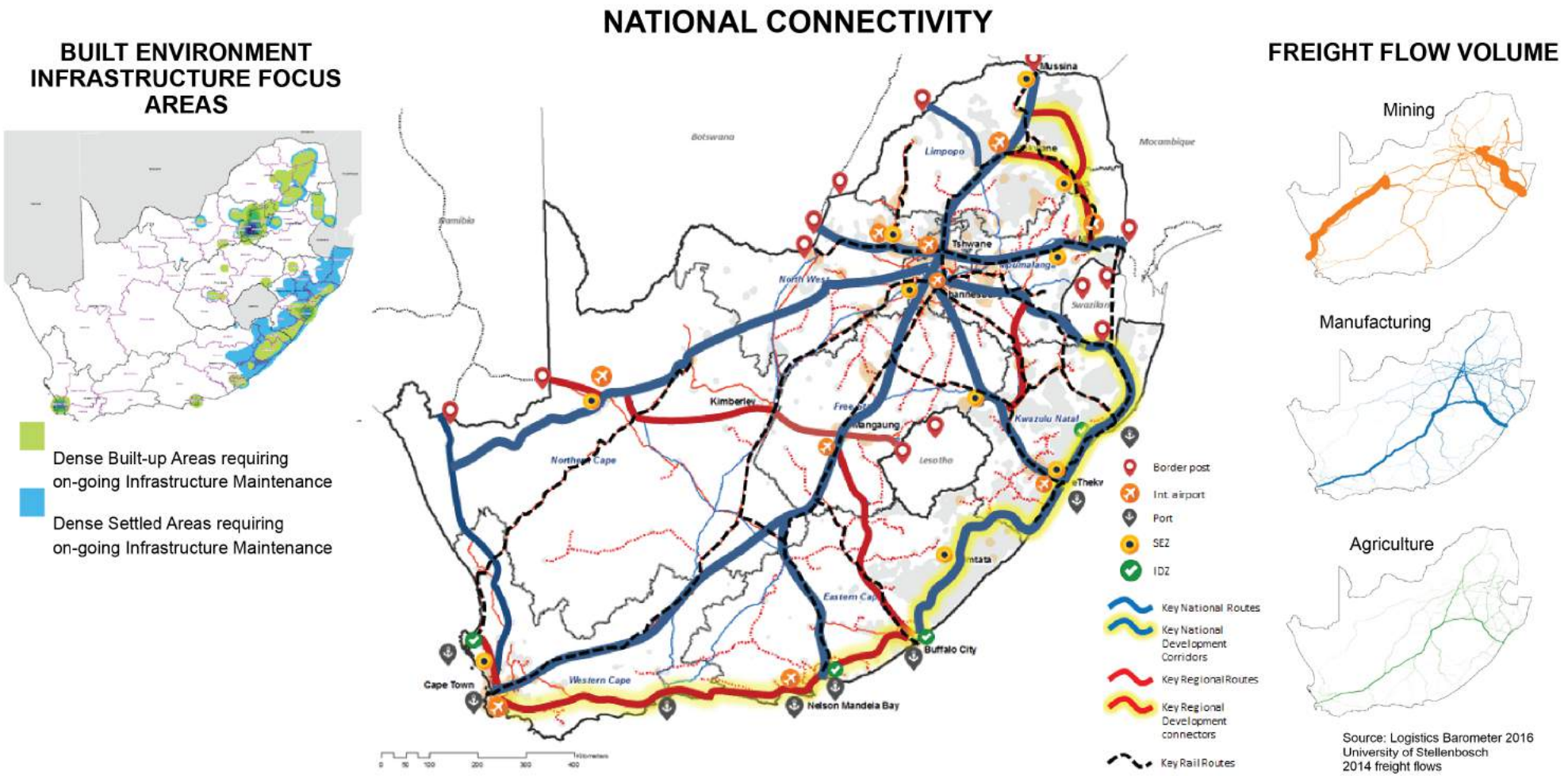


Figure 21: Movements, Connections and Flows – Inter-regional Trade Connections

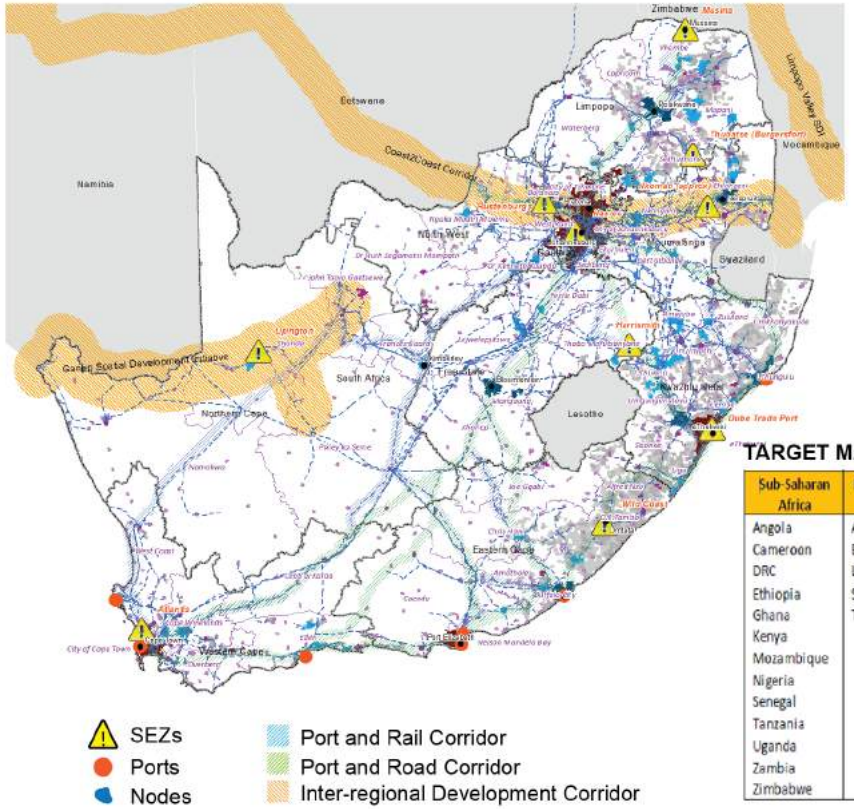
INTER-REGIONAL TRADE CONNECTIONS

Urban regions act as international gateways for trade with the SADC region and world - 86.5% of total national formal economic activity in 2016

Gateways	- Trade, Logistics, Ports - Government Services - Knowledge Economies, Research
Attractors	- Urbanisation and activity - International Tourism
Inter-regional Centres	- Administrative, Education - Service Related Economies - Green Economy, Mining, Manufacturing, Industrialisation

Improved Exports Require Strong African Integration Inter-regional Gateways and Enabling Trade Environment

- Total port costs in South Africa was **190% above the global average in 2014/15.**
- The top **1% firms responsible for 80% of South Africa's exports** (International average of 55%).



TARGET MARKETS

Sub-Saharan Africa	North Africa	Asia	Latin America	North America	Middle East	Europe
Angola	Algeria	China	Argentina	Canada	Iraq	EU 28
Cameroon	Egypt	Hong Kong	Brazil	Cuba	Iran	Russia
DRC	Libya	India	Chile	Mexico	Kuwait	Turkey
Ethiopia	Sudan	Indonesia	Peru	USA	Oman	
Ghana	Tunisia	Japan	Colombia		Qatar	
Kenya		South Korea	Venezuela		Saudi Arabia	
Mozambique		Malaysia	Uruguay		UAE	
Nigeria		Philippines				
Senegal		Singapore				
Tanzania		Thailand				
Uganda		Vietnam				
Zambia						
Zimbabwe						

TOWARDS Spatial Perspectives in Support of The NGP. Unpublished Report Prepared By The CSIR For EDD; SACN, SOCR, 2016). Integrated National Export Strategy (INES): "Export 2030". the dti.

Figure 22: Movements, Connections and Flows – Energy

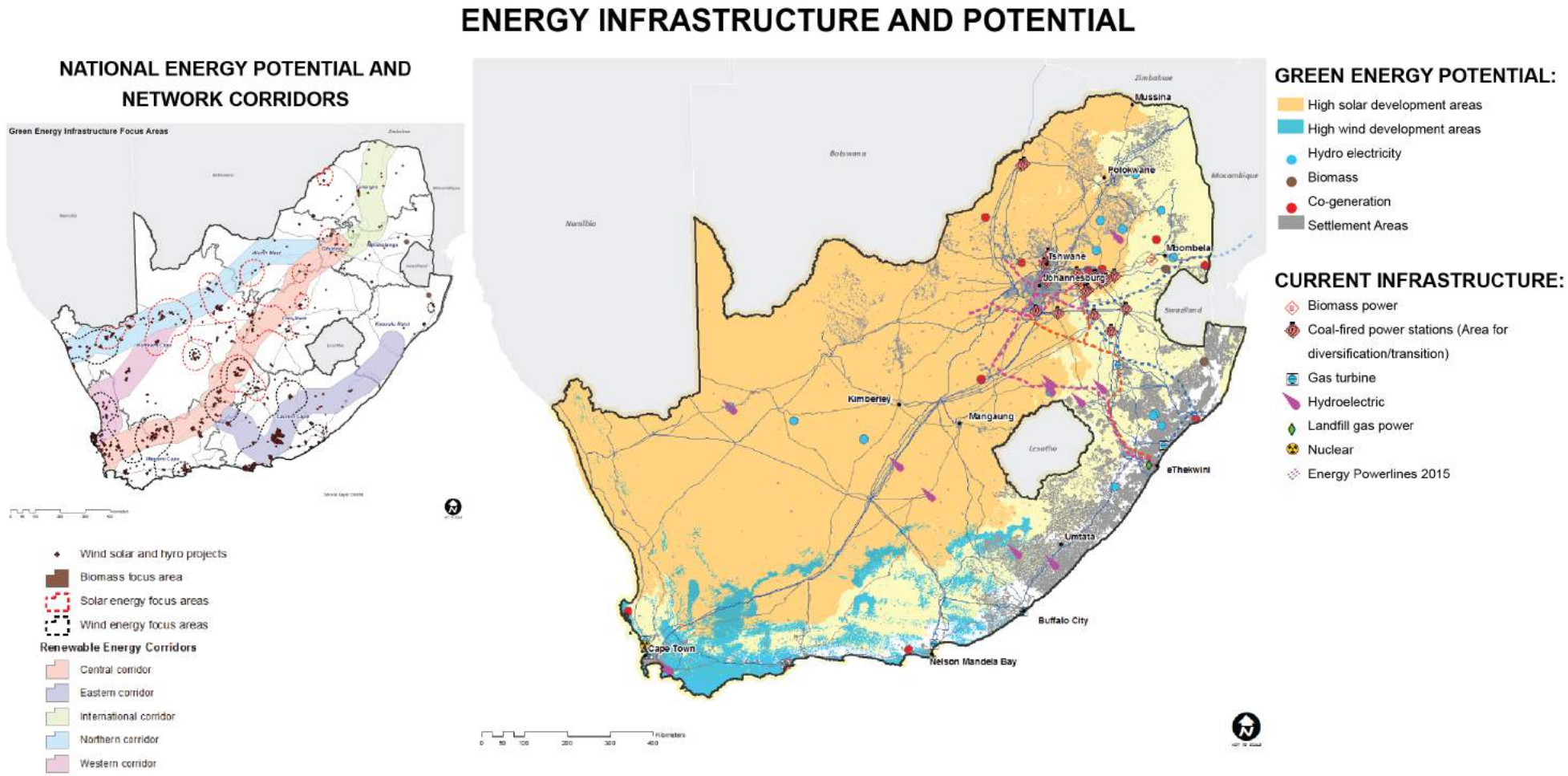
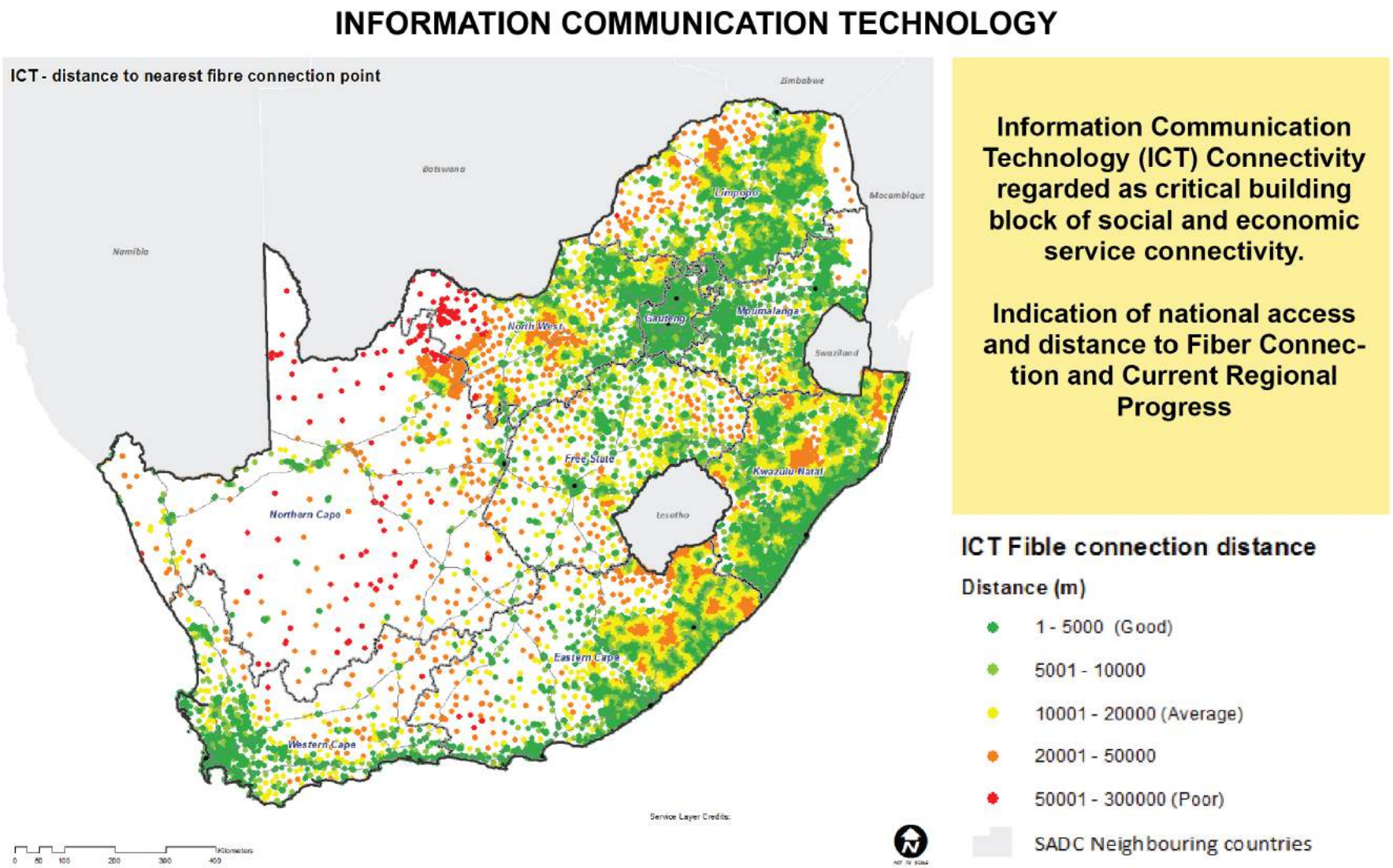


Figure 23: Movements, Connections and Flows - ICT



3.10 Globalisation, Supra-National Regionalisation, Gateway Nodes and National Connectivity and Integration

Despite the current setbacks for global trade, the long-term trend will be for (1) increased global trade, and (2) increasing integration of countries and cities in the global economy. The importance of being part of this global economy and to be 'an equal partner' in this system, will demand of countries, including South Africa, to *ensure ease of access to their economies* through well-functioning (1) *global gateways,* i.e. harbours, airports and border posts, and (2) a *well-maintained national road and rail network.* The latter will also ensure that the whole country, and not only parts of it become and remain part of this global economy. *Prioritisation of routes* on this network will be very important, as funds for road and rail connections will be severely limited. Where possible*, rail should be prioritised,* to (1) reduce carbon emissions and damage to roads by trucks, and (2) minimise the social costs that communities in towns with truck stops, especially their most vulnerable members, often suffer.

Significant changes are also envisaged in the top order of the global economy, with (1) *China and India* set to greatly strengthen their positions, and (2) *regional powerhouses*, such as Indonesia, Brazil, Turkey and Mexico poised to increasingly make their presence felt. Furthermore, a number of countries on the African continent are rising rapidly, notably Ethiopia, Rwanda, Ghana, Kenya, Nigeria, Egypt and Angola. Closer to home, Mozambique is growing at a steady pace, and Zimbabwe should be making rapid economic progress in the next few decades. Should South Africa wish to remain a part of this global economy, it will need to ensure that *its urban and rural-based economies are globally competitive,* which would amongst others, require (1) reducing constrains on small business development, and (2) the upskilling of our labour force. From a *national spatial perspective*, South Africa must ensure that it ties its economy into the (1) new global economies, (2) regional powerhouses, and (3) emerging economies on the African continent. This must be done though aligning its ports with the growing significance of new trade routes to the east of the country, and ensuring fast and reliable connectivity through these ports to not only the Gauteng urban region, but also other regions in our country with strong export opportunities.

Of equal importance will be the *strengthening of regional trading blocs*, such as the African Union (AU) and the Southern African Development Community (SADC), to (1) create greater regional consumer markets and (2) ensure more bargaining power when negotiating the terms of trade with other such blocs, e.g. the European Union. *Alignment of national freight and logistics infrastructure,* especially the (1) major road and rail corridors, but also (2) harbour infrastructure, will be required to establish and sustain strong regional linkages within SADC.

Internally, if a fast-growing, well-connected and more inclusive economy is to be achieved, the development of movement infrastructure and a variety of modes of transport will have to be guided by *a national spatial development pattern* with at its base (1) the pursuit of more compact, concentrated settlement in fewer core national nodes, to reduce the number of main roads and railway lines to be built and maintained, (2) more mixed, higher density development, to reduce the need for motorised travel and distances to be travelled, and (3) higher levels of beneficiation and processing of raw materials, to reduce the volume of raw products that pass through our harbours and require road and rail transport and expensive infrastructure networks.

The movement network will also have to be strengthened in the *eastern escarpment and eastern and southern coastal areas,* to support the

population, economic and climatic shifts described earlier in **Section 3.6**. In addition to this, infrastructure maintenance will have to be prioritised, not only for freight transport, but equally so for the safe, efficient and affordable movement of passengers, including tourists. In densely settled urban areas, a special emphasis will need to be placed on the provision of more affordable public transport services in Transit Oriented Development-configurations.

3.11 Institutional Weaknesses and Fragmentation and Prospects for National Developmental Action

In a country with the dreadful history of exploitation and targeted underdevelopment like South Africa's, there are *high expectations of the State* to assist in (1) correcting the wrongs of the past, (2) healing the still-open wounds, and (3) creating a different and better future. This is, and has proven to be a huge endeavour, and one that government has managed to attend to with different degrees of success. What has not made this '*national transformation, reconstruction and redevelopment task*' any easier is *the* '*cutting-up and parcelling-out*' of inherently highly integrated *national* reconstruction, transformation and redevelopment tasks to different spheres of government in terms of the Constitution, with limited powers of one sphere over another to bring about (or force) the required *nationally-focused and significant* alignment, integration and coordination. In addition to this, the need to bring other spheres of government on board in planning processes, also has a cost-implication, requiring of officials to (1) meet and talk through such tasks, and (2) try to find ways to coordinate, align and harmonize their actions.

Given a wide range of reasons, notably (1) the costs involved, (2) the lack of enforcement of decisions reached in multi-stakeholder engagement sessions, (3) the different modalities and work and budget-cycles, and (4) the unique particularities of decision-making in the different spheres and sectors of government, *national sector departments* have increasingly focused on fulfilling their mandates and *going it alone in their pursuit of meeting their set targets.* In addition to this, *inefficiency, incompetence, corruption and theft of state resources* has (1) led to an erosion of trust in public institutions, (2) severely damaged the culture of service delivery in the public service, and (3) siphoned off billions of Rands required for redress and development. The result has been an increasingly frustrated populace that has lost much of its trust in the State and its capabilities. Another outcome of State failure has been an increasingly greater reliance on (1) the private sector and (2) outside countries and entities to finance much-needed infrastructure investment. While 'it may get things done', it may also lead to (1) the country losing control over its resources, and (2) an inability to implement plans and frameworks that are in the national interest, rather than those that are in the interests of the private investors or foreign countries.

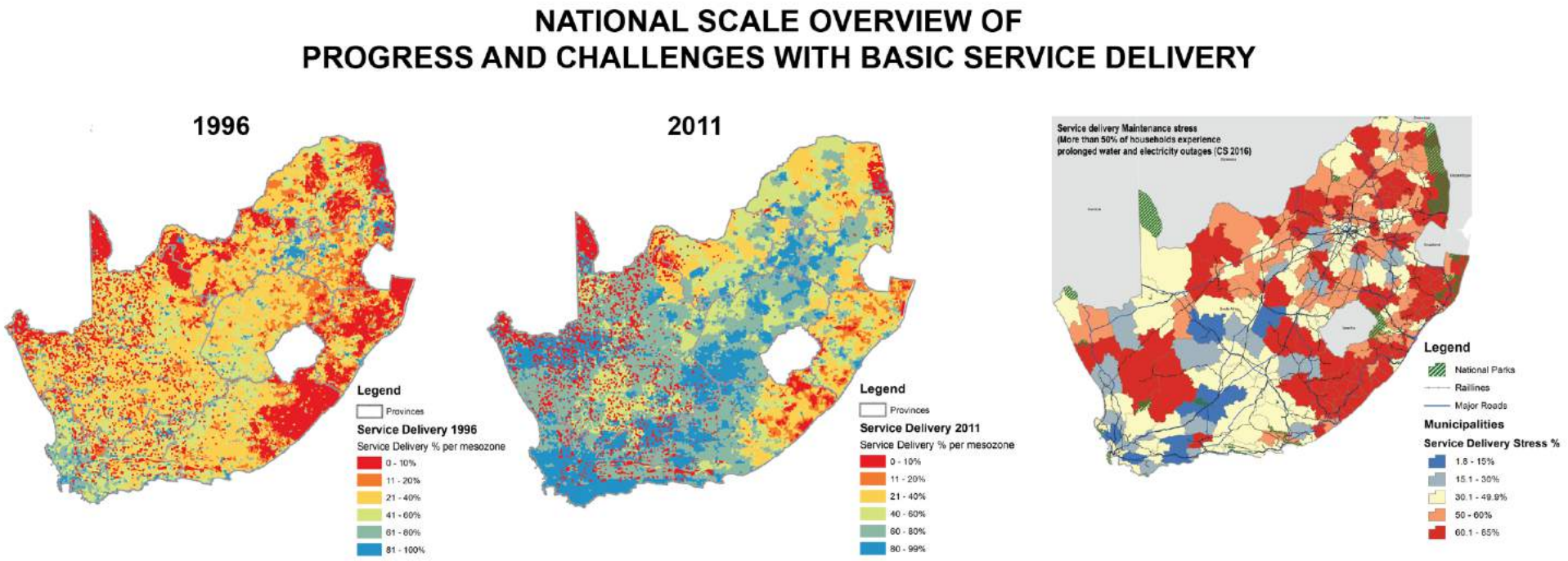
In the provincial sphere, many *provincial governments* have prepared provincial economic growth and development plans and spatial development frameworks to attend to their economic, spatial development and human settlement challenges, but have in most cases lacked (1) the funds required to put these plans into motion, given that the bulk of their funds are tied to the provision of education, health and welfare services, and (2) struggled to secure *national sector department* and *municipal buy-in to* and *support for* these plans and frameworks.

In the *local space,* municipalities are increasingly struggling to provide basic municipal services, often overwhelmed by the huge national redevelopment and transformation tasks they have been given. And, while the crucial and potentially very powerful (1) spatial planning and transformation, and (2) land use management functions resort with them, most municipalities lack the leadership, technical capacity and finances to adequately execute their mandates. At the same time, many

municipalities have turned *ever-more inward,* both in terms of municipal planning and the provision of municipal services, which has been hugely detrimental to *progressive, transformative municipal-wide planning*, and subsequently also provincial and national planning and transformation. In addition to this, *in distressed mining and heavy manufacturing areas,* municipalities were not only hard-hit by job losses and business closures, but also lost their steady and significant incomes from the sale of water and electricity to mines and factories. In many *rural areas,* municipalities have struggled to prepare credible plans and achieve the desired developmental impact, given (1) the vast size of their areas of jurisdiction, (2) a lack of capacity, and (3) the enormity of their inherited service backlogs.

While *the State is and remains crucial* to the reconstruction, transformation and development of our country, it is currently struggling to do so. Inadequate funding and capacity, and a loss of trust and legitimacy in the eyes of the people, coupled with a deficit of political will, are key constraints on this crucial endeavour. Failure to deliver on much smaller tasks has also *reduced confidence* in the ability of the State to attend to the large national transformation questions. As such, rebuilding trust and showing progress in the areas of transformation will be crucial in the next decade. Making good on planned interventions and ensuring feasibility of investments in terms of a long-term plan will also assist in this regard. To do so *within the limited budgets available* will require (1) far more spatial targeting, integration and alignment in infrastructure investment and development spending by the State, and (2) ensuring that existing and possible systemic links between places and communities are optimised. Careful planning of the placing, type and reach of State facilities will go a long way in assisting such processes. Equally so will be careful planning of the *national spatial development pattern,* to concentrate resources and investment in areas where the majority of our people are living and are likely to live in future. Such national, regional and local-scale planning will, however, require (1) staffing of government departments and municipalities with well-trained, ethically-solid professionals; (2) far more direction and clarity in terms of *what is to be done*, where, when, for how long, and by whom; and (3) the introduction of the necessary systems to drive and assess compliance and ensure accountability.

Figure 24: Institutions and Services – Basic Service Delivery

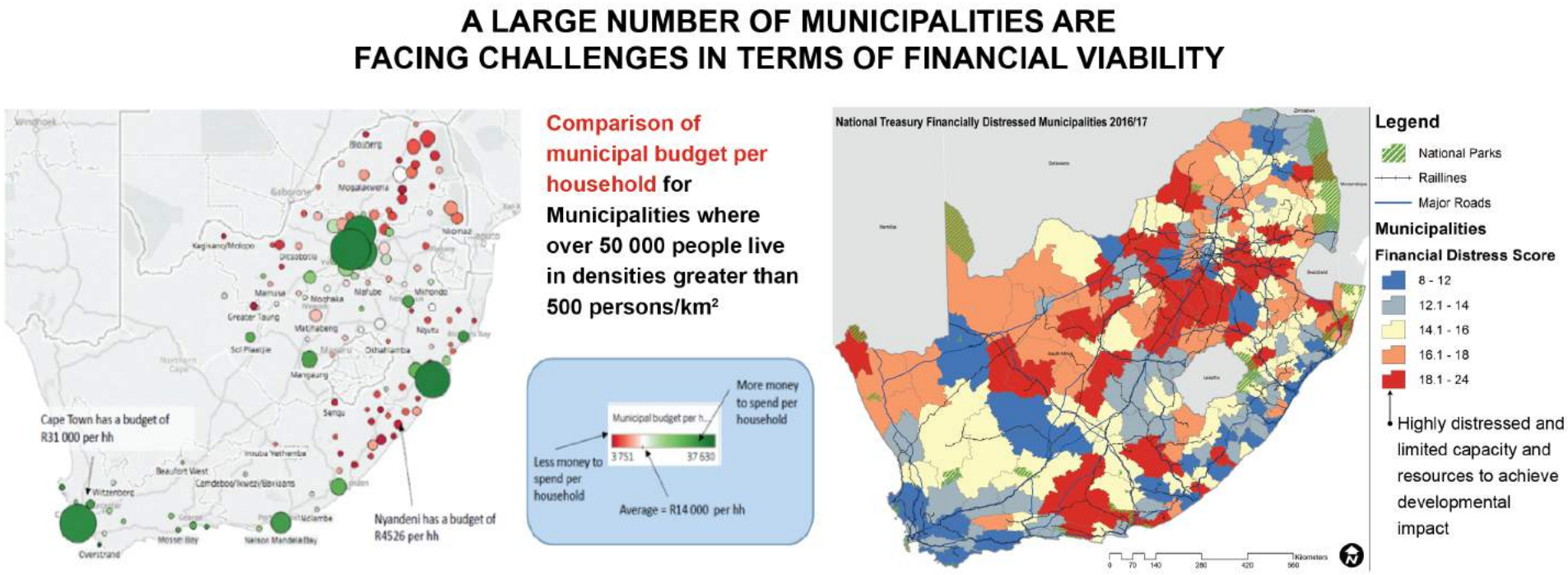


Service Delivery Provision and Access to Water, Electricity and Sanitation, Comparisons between 1996 and 2011 in relation to number of households with access to services.

Service delivery maintenance stress, where more than 50% of households experience prolonged water and electricity outages (2016)

StatsSA, 2011. National Treasury, 2018. Government Performance in South Africa, 2016

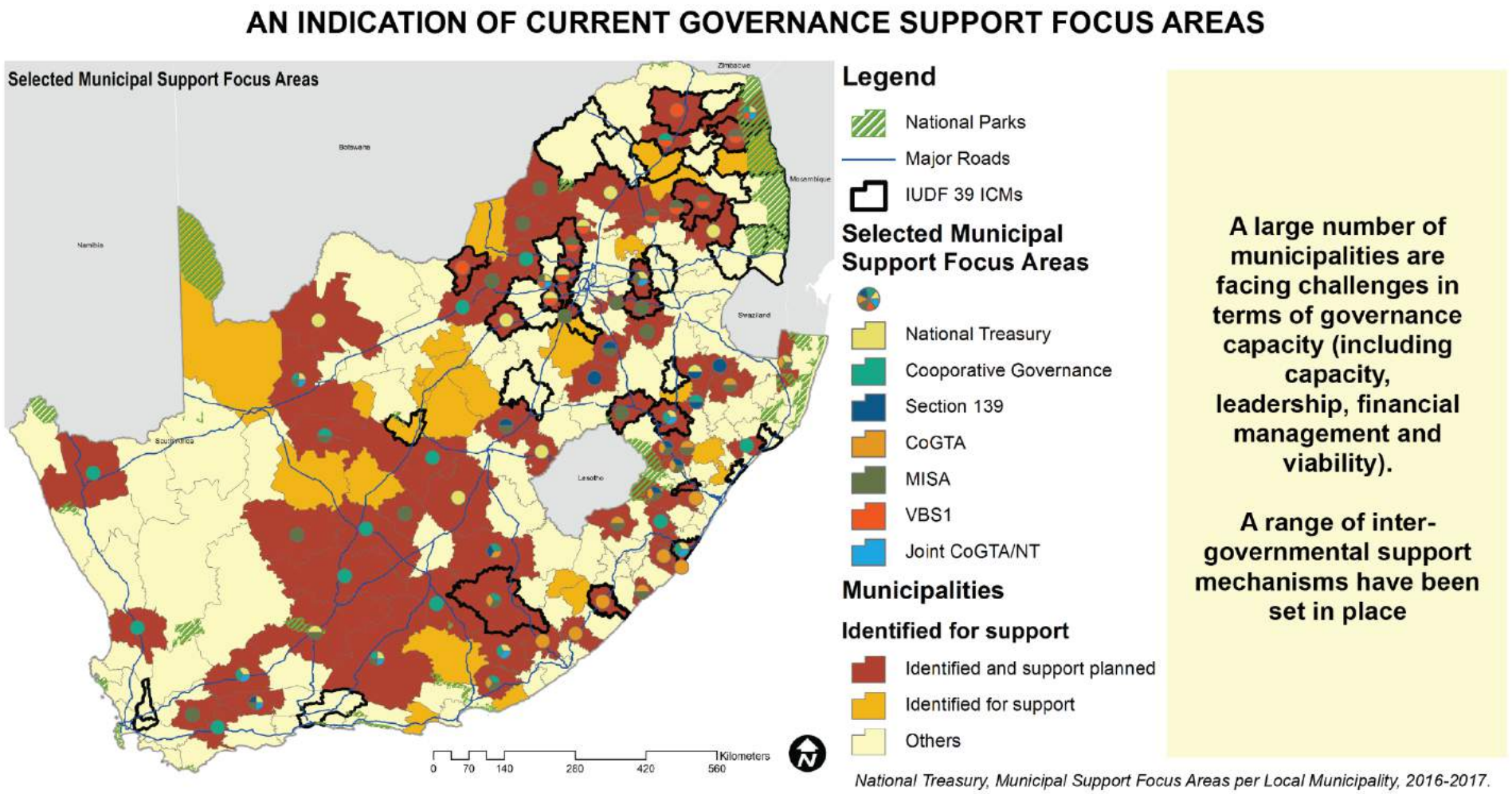
Figure 25: Municipal Financial Viability



Large numbers of financially distressed municipalities has significant implications for local service delivery. It also has significant implications for national developmental impact within an intergovernmental system where developmental local governments are required to fulfill key roles as part of a bigger developmental state.

IUDF Presentation 2018; National Treasury, Municipal Financially Distressed Municipalities, 2016-2017

Figure 26: Institutions and Services – Municipal Capability



National Treasury, Municipal Support Focus Areas per Local Municipality, 2016-2017.

Figure 27: Institutions and Services – Municipal Capability

LOCAL GOVERNMENT (AND THE MAJOR CITIES IN PARTICULAR) ARE CRUCIAL ACTORS IN THE COUNTRY'S DEVELOPMENT AND IN BUILDING A CAPABLE STATE IN LINE WITH THE NATIONAL DEVELOPMENT PLAN (NDP)

Municipal Capability for 2017 (Capable Cities Index)	
Capacity (municipal conduct focused internally), **Performance** (municipal conduct focused externally), & **Compliance** (municipal conduct in relation to the law).	• The capacity of municipalities has significantly improved; • 45 municipalities did not have a permanent municipal manager and CFO; • Intervention under section 139 of the constitution can improve municipal capacity; • 30 % of municipalities would still require external assistance to reach full capacity; • Cities are now performing better in filling vacant positions of senior managers; and • Being a metropolitan municipality does not necessarily mean improved capacity.

The Capable Cities Index (CCI) (Applied Constitutional Studies Laboratory at UWC (2017)), measures and ranks the capability of South Africa's municipalities on the basis of their consistency in maintaining high levels of capacity, performance and compliance, with a focus on the 27 largest cities.

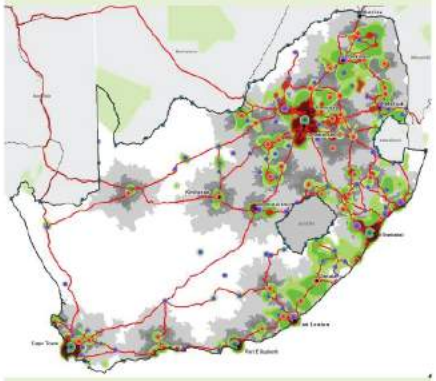
Components of Municipal Capability	
Environmental capability	The social and demographic composition of citizenry; economic circumstances (including the tax base); spatial structure of settlements; and ecological, geographic, natural, mineral, and environmental context in which individual municipalities function.
Institutional capability	The structure and functionality of the organisations with which the municipality needs to interact. This includes policy, legislation, the institutional framework, and the relationships between organisations, including the regulatory, enabling, and support arrangements for local government. It also includes the financial framework within which municipalities function.
Organisational capability	Internal policies, organisational structure, ability to manage relationships and contacts with other organisations, strategic leadership, organisational purpose, organisational memory, internal confidence, human resource management, operational systems, technical capacity (ability to provide and manage infrastructure) and financial abilities.
Individual capability	The potential and competency that is found within a person. It is normally reflected through their technical and generic skills, knowledge and attitudes accumulated through education, training, experience, and networks

Parnel, s., Moodley, N., and Palmer, I., 2017. Defining the four components of capability

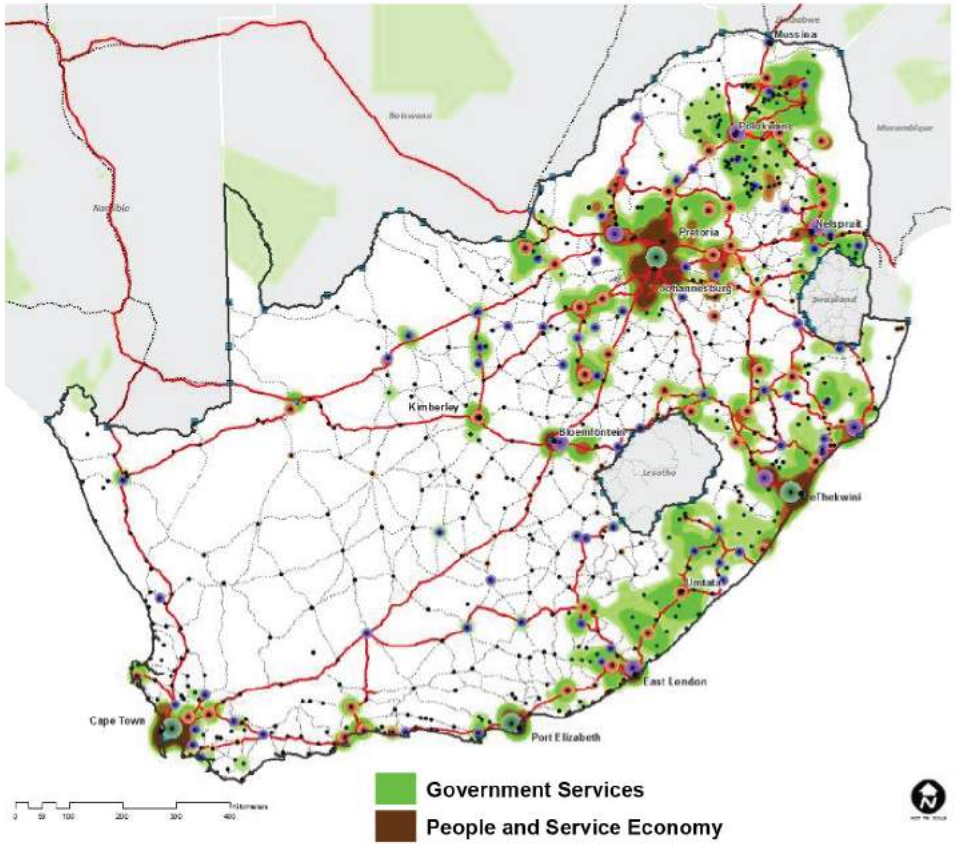
Figure 28: Institutions and Services – Social Services

PEOPLE AND SERVICE ECONOMY

The Service Economy (Government services) closely follow the dense rural settlement pattern, with a high concentration of such services in the eastern areas.



Range of cities and towns provide services within location and surrounding hinterland, with higher order services having a quite significant reach in sparsely populated areas.



Social Service Demand and Opportunities

Associated with Access and Social Facility Requirements for projected 2050 Population (CSIR Green Book, 2018) at existing service standards

Selected Social Facility Requirements (Number of additional new facilities required)	Additional Units (after 2016 until 2050)
District Hospital L1	60
Community Health Centre	190
Primary Health Clinic	272
Branch Library	270
Home Affairs (medium sized)	190
Solid Waste Disposal and Recycling Depots	190
Community Halls (if large)	317
Social Grant Pay Points	900
ABET/Skill Training Facilities	95
Secondary Schools (if large)	1 523
Primary School with Grade R (if large)	2 721
Early Childhood Development Centres	6 348
ECD Resource Hub	952
Regional Sport Stadium/Complex/ Indoor halls	70-100

3.12 Key National Spatial Development Dynamics, Challenges and Opportunities

The key national spatial development challenges and opportunities (1) that emerged from the discussion of the ten **National Spatial Development Shapers** and (2) that the NSDF will have to respond to are:

- Providing life chances and a decent quality of life to *an additional 17 to 22 million people* between now and 2050, within the context of (1) an ever-smaller habitable land area due to climate change, (2) ever-more stressed, threatened and compromised ecological spaces and systems, and (3) ever-fewer natural resources;
- Ensuring *rapid redress at scale to Black South Africans* (1) dispossessed of their land, (2) systematically excluded from the economy, and (3) severely restricted and stinted in their life chances, while at the same time rapidly growing and transforming the economy and transforming national, provincial and local space;
- Maintaining *national biodiversity and ecosystem integrity* for global, national and local resilience within an environment of a young, dynamic and aspirational population;
- Managing competition between *human activity and nationally important ecosystems and the essential services they provide*, notably so with regards to water production, energy generation, mining, manufacturing and food production in the central and eastern parts of the country;
- Managing *surface and groundwater use* and potentially harmful land-uses in surface-water production areas, preventing contamination of water bodies and sources by human activities, rehabilitating contaminated water bodies, streams and rivers and maintaining bulk and local reticulation water infrastructure;
- Making the shift to *a greener, low-carbon, more service-based economy* through (1) compact, mixed land-use well-connected urban and rural settlement development, (2) the provision of enabling municipal services, and (3) efficient and affordable ICT and transport infrastructure investment and development;
- Optimising the enormous economic growth and job creation opportunities that *dense, compact and diverse urban agglomerations and development corridors* offer in the areas of human-to-human service provision, trade, entertainment, and the creative industries, especially so in an ICT-rich, but also job-threatening 4th Industrial Revolution environment;
- Improving the *quality of life and human capability* in a fiscally-constrained environment through (1) the well-located, planned and integrated provision of social services, and (2) the optimisation of the economic and employment benefits of such service provision in all our cities, towns and villages;
- Transforming the current highly financialised commercial farming *agricultural sector into a mixed system,* including hundreds of thousands of small and medium-sized producers, and optimising the economic dividends from the research, marketing, financing and equipment development opportunities that this transition will create in both urban and rural South Africa;
- Competing in *the global economy* through innovative product and service development in especially our large cosmopolitan urban regions, with an emphasis on (1) the creative industries, and (2) the cultural and entertainment sectors, and utilising both of these to bolster our tourism offering;
- Optimising the enormous economic opportunities that *SADC* offers for (1) trade, (2) collaborative research and knowledge development, packaging and distribution, (3) water-sharing, and (4) energy generation;

- Identifying and utilising opportunities for the *beneficiation* of minerals, metals and agricultural products where it is economically viable and ecologically sustainable; and
- Optimising our existing *national transport infrastructure network* by (1) prioritising rail over road, and (2) investing in and maintaining the most crucial components of the network, with an emphasis on connecting global gateways, core urban nodes and regional development anchors throughout the country.

PART FOUR: National Spatial Development Vision, Logic, Levers and Outcomes

4.1 Introduction

In this part of the NSDF a number of the core components of the **National Transformation Logic** (see **Section 1.2**) are covered. In the first section, the **National Spatial Development Vision** to direct, guide and align spatial planning, infrastructure investment and development is provided. This is followed by an exposition of the shifts that need to be made from the current **National Spatial Development Logic** to the required **Post-Apartheid National Spatial Development Logic** in accordance with the **National Transformation Logic** (see **Section 1.2**). Following this exposition is an introduction to, and overview of a series of **'National Spatial Development Levers'** to bring about the **Post-Apartheid National Spatial Development Pattern** in accordance with the **Post-Apartheid National Spatial Development Vision** and **Logic.** This is followed by a section outlining a series of *five* **National Spatial Development Outcomes** that *must* and *will be* accomplished by (1) making the shifts in accordance with the **Post-Apartheid National Spatial Development Logic**, and (2) putting the **National Spatial Development Levers** to their envisaged use. These outcomes connect the **National Spatial Development Vision** and **Logic,** as set out in this part of the NSDF (i.e. **Part Four**) to the desired **National Spatial Development Pattern** in **Part Five**. Following this section is **a vision of what life could be like in South Africa in 2050** should we jointly (1) work towards the *vision,* (2) make the necessary shifts in our *spatial development logic,* (3) use the *levers* as envisaged, and (4) pursue the *outcomes,* as set out in this part of the NSDF.

4.2 The National Spatial Development Vision

The purpose of the **Post-Apartheid National Spatial Development Vision** is to provide a *long-term guiding light* for realising our desired **Post-Apartheid National Spatial Development Pattern**. As set out in the **National Transformation Logic** (see **Section 1.2**) and the NSDF's *Theory of Change* (see **Section 1.4.3**), this vision is:

- Derived and drawn from the **National Development Paradigm**, with as its key pillars the Constitution, the NDP, and the full suite of post-1994 legislation and policy; and
- Prepared within the current and anticipated future challenges and associated opportunities facing our country (see **Part 3** and specifically **Section 3.13**).

In addition to the more eternal long-term **National Spatial Development Vision** and accompanying Mission-statement (see **Figure 29** below), a time-bound **2050-National Spatial Development Vision** is provided in **Section 4.5.** This vision serves to make (1) the future more tangible, and (2) our infrastructure investment and development spending actions more measurable in terms of moving our country from where it is now to where we want it to be.

4.3 The National Spatial Development Logic

A key driver in the NSDF's theory of change (see **Section 1.4.3**) is the move from a **National Spatial Development Logic** based on, and in service of the **colonial and Apartheid National Development Paradigms**, to one *based on and in service of* a **Post-Apartheid National Development Paradigm**. In this regard, it is framed and guided by:

- The *NDP* targets, strategic levers and strategic policy direction; and
- The five normative principles, as provided in *SPLUMA*.

In this section of the framework, (1) the direction and guidance provided by the NDP and the five SPLUMA principles, and (2) the *shifts* that have to be made in the **National Spatial Development Logic** are set out.

Figure 29: The National Spatial Development Vision Statement

"All Our People Living in Shared and Transformed Places in an Integrated, Inclusive, Sustainable and Competitive National Space Economy"

The accompanying ***Mission Statement*** *reads as follows:*

"Making our Common Desired Spatial Future Together Through Better Planning, Investment, Delivery and Monitoring"

4.3.1 The NDP as Guide and Driver

The NDP identifies a set of national development priorities, which include targets for economic growth and employment, equality and prosperity. It also identifies (1) *inclusive growth,* (2) *the capacity of our people,* and (3) *a capable state,* as the *levers* to achieve these targets. The link between the targets, levers and strategic policy direction, as provided in the NDP, is summarised in **Figure 30**.

Figure 30: The NDP Levers and Objectives-Framework

The national spatial development implications of the strategic direction provided by the NDP in the formulation of a new **National Spatial Development Logic** can be interpreted as follows:

(a) With regards to Inclusive Growth

A need to:

- Transit to a compact, service-based, resource-efficient space economy, that includes both rural and urban spaces, and that recognises the limitations of our national natural resource base;
- Consider the long-term resilience-benefits of a more compact settlement footprint in spaces less prone to the impacts of climate change, and adjust (1) settlement development forms and patterns, (2) housing types, building materials and construction methods, and (3) transport and service networks accordingly;
- Increase access and remove barriers to (1) the often concentrated and barricaded benefits of the national resource base, and (2) the locational benefits and amenities of exquisite and exclusive places developed for the few;
- Promote inclusive and sustainable urban settlement growth and facilitate movement and trade in and between settlements;
- Support growing economic nodes in previously forgotten and ignored regions, and ensure a more diversified economy;
- Deal with declining mining and industrial areas in compassionate, smart, affordable and sustainable ways; and
- Recognise and develop settlements in accordance with their (1) roles in the national space economy and network of settlements, (2) regional and local contexts/settings, and (3) labour-absorption capacities.

(b) With regards to the Capacity of our People

A need to:

- Ensure access to, and provision of quality services to all South Africans, to enable the development of human capital irrespective of where it is located in the country;
- Develop national urban centres of service excellence and innovation, to drive and maintain the global competitiveness of our country; and
- Develop differentiated, place-specific and viable responses to critical issues, such as service gaps, migration hot-spots, high levels of youth unemployment and exclusion, and land availability and tenure-related issues.

(c) With regards to a Capable State

A need to:

- Recognise and use (1) spatial planning as a tool for transformation, and (2) spatial planning processes and plans, such as SDFs, as opportunities for integrating and coordinating State action;
- Introduce a new spatial development logic and vision in the process of building a new, cohesive society; and
- Attend to state capacity gaps, to ensure fulfilment of the NDP's developmental agenda.

4.3.2 The SPLUMA Principles as Guide and Driver

In addition to the policy directives provided by the NDP, SPLUMA provides *five guiding principles* that have to be used and observed *in all spatial planning processes at all scales,* including *the national scale*. These principles are the following:

- Spatial justice;
- Spatial sustainability;
- Spatial resilience;
- Spatial efficiency; and
- Good administration.

In terms of the formulation of a new **National Spatial Development Logic**, the following guidance and direction is drawn from these principles:

(a) Spatial Justice

A need to:

- Ensure redress in terms of access to the economic opportunities and locational benefits that the country and its cities, towns and rural areas offer, including well-located, productive land;
- Include inclusion of previously excluded areas in the national space economy; and
- Pursue intergenerational justice in (1) the location and pattern of settlement development, and (2) the use of natural resources.

(b) Spatial Sustainability

A need to:

- Ensure national spatial development within the limits of the natural resource base of the country – now and in the future;
- Pursue the development of viable settlements and sustainable economies; and
- Pursue a more concentrated, well-connected and more compact national footprint, to increase access to opportunities for all, and reduce (1) use and wastage of natural resources and State finances, and (2) the need for motorised transport.

(c) Spatial Resilience

A need to:

- Proactively minimise risks to settlements though the considered selection of the location and pattern of settlement development; and
- Develop settlements in ways that reduce their dependency on carbon-based fuels and grid-based energy-distribution systems, as and where possible, to mitigate and reduce their climatic impact.

(d) Efficiency

A need to:

- Optimise the use of all State and non-State resources, and minimise the negative impacts of settlement development, wherever it is done and whatever spatial form it takes; and
- Diversify and densify settlements to reduce transactional costs and the need for motorised transport.

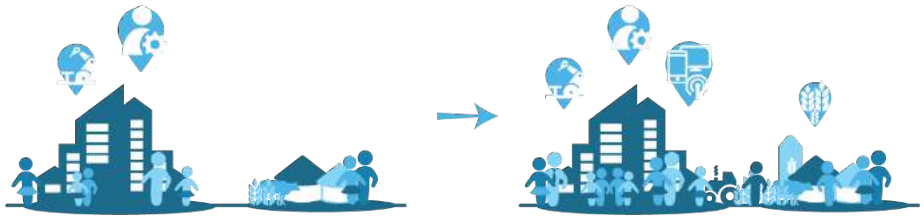
(e) Good Administration

A need to:

- Pursue coordination, integration and spatial alignment in all forms of government spatial planning, budgeting and investment;
- Ensure maximum participation and active engagement in spatial planning and settlement building, grow the local economy and tax base, and build social cohesion; and
- Ensure adherence to the law, notably SDFs and municipal Land Use Schemes (LUSs), to ensure that the social, spatial and economic benefits of good spatial planning materialise.

4.3.3 The Necessary 'Shifts'

Based on the NDP and SPLUMA as *guides* and *drivers,* the following interrelated *shifts* in the **National Spatial Development Logic** are proposed by the NSDF to ensure the movement to a truly **Post-Apartheid National Spatial Development Pattern**:

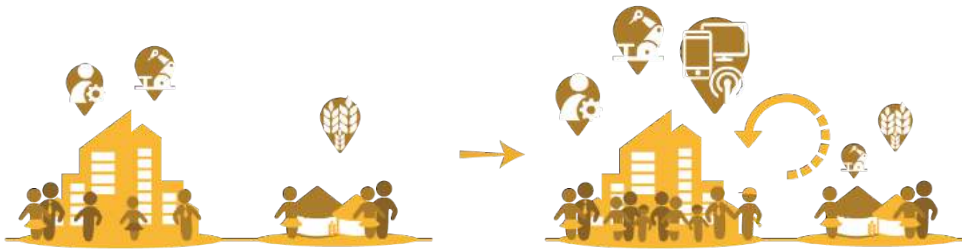


(a) With regards to the beneficiaries of national spatial planning and spatial development

- Placing the interests and benefit of the many at centre stage, and not those of a/the few;
- Ensuring access for all to the use of land for residential, social, economic and cultural purposes, both in urban and rural areas;
- Limiting the development of luxury enclaves and estates for the use and enjoyment of the few; and
- Ensuring rapid release of land through well-planned urban and rural land reform at scale, for the use, development and enjoyment by the many.

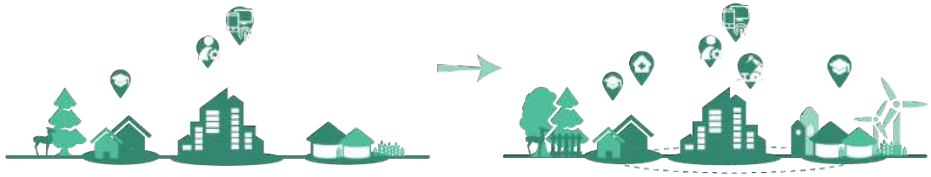
(b) With regards to our natural resource base

- Placing a much greater focus on, creating a much greater awareness of, and introducing a far greater quantification of our natural resource base, to enable and enhance the sustainable use and protection of critical natural resources;
- Making a clearer distinction between the ecological and economic value of natural resources and pursuing a far greater interest in and understanding of future trends and risks in natural resource use;
- Identifying and earmarking broad categories of (1) high-value agricultural land for national food security and agrarian reform, and (2) environmentally-significant areas for the provision and use of essential ecosystem services.



(c) With regards to the nature, function and performance of our settlements

- Recognising our settlements as 'our new gold', and establishing a new, renewable people and place-based economy based on human interaction and ingenuity in quality urban spaces, and no longer a finite, ecologically-unfriendly mineral and metals resource-extraction driven economic model;
- Reframing the old logic of cities as 'engines of growth' in service of capital, to '*cities as engines of radical transformation in service of inclusive, people-focused, people-driven development and transformation'*, and unleashing the enormous opportunities they offer for (1) the human-to-human services sector, (2) the innovation, knowledge-creation, valorisation and sharing sector, (3) the culture, entertainment and restaurant sector, and (4) the domestic and international tourism sector;
- Optimising the dividend of the millions of young South Africans that will be entering higher education, and be (1) gaining new insights, (2) 'making new sense' of the world, and (3) developing new forms of knowledge;
- Recognising cities as democratic spaces in which millions of economic activities and transactions take place and *can* take place, and in doing so, have the power to disrupt and destroy the highly concentrated, monopolistic nature of our economy;
- Emphasising the need to develop a new kind of city in which *public space* can become a key driver of a new '*people's economy from below'*;
- Pursuing a denser, smaller, polycentric system of settlements that has (1) a smaller footprint, and (2) spans urban and rural areas;
- Making a clear distinction between the roles and capacity of different types of settlement on the national settlement network; and
- Recognising the need for the future-proofing of cities as sites of human innovation in becoming active participants in, and not victims of the era of Artificial Intelligence (AI) and the 4th Industrial Revolution.



(d) With regards to our rural areas

- Recognising the need to develop and strengthen regional-rural systems in the pursuit of vibrant, inclusive and sustainable rural development;
- Pursuing the identification, development and strengthening of *'regional development anchors'* in rural areas, to (1) *connect urban to rural areas* in mutually-beneficial ways, and (2) act as catalysts for *regional-rural development*;
- Developing a systems-based *'polycentric rural service-delivery network'* around regional developments anchors and carefully selected *'rural service towns'*, to provide quality public services, and ensure far greater levels of rural-to-rural interaction and local economic development;

- Exploring the delineation of *'rural edges'* in rural areas to ensure the protection of (1) the unique, intrinsic qualities of our rural areas, (2) the cultural, customary and historical value they have, and (3) the often highly sensitive ecosystems they harbour;
- Pursuing *intra-rural trade* as core systemic and social glue/cohesion-activity between villages and towns in rural areas, and *not shopping malls,* which at core are little more than 'one-sided-extraction transaction points'; and
- Pursuing greater resilience of rural areas through diversification, in so doing ensuring that they are not and do not become 'single-economic sector' places.

(e) With regards to the nature, significance, form and impact of spatial development planning

- Ensuring greater coordination, integration and collaboration in spatial development planning, both *in* and *between* the spheres and sectors of government, including the use of (1) *national spatial targeting* and (2) *differentiated responses* to the potentials and challenges of designated sub-national intervention areas;
- Investing at scale in areas identified for future economic growth, for *the necessary period of time to make an impact*, and with the benefit of not only the national economy, *but also the regional and local economies* in mind;
- Placing a far greater focus on the developmental impact of national investment and spending initiatives on (1) sub-national regions and (2) the livelihoods and well-being of communities in such regions;
- Introducing a *'spatial transformation accountability system'* to set spatially-focused targets, and drive and measure progress with regards to (1) targeted investment in national priority spaces, (2) spatial transformation, and (3) the wise utilisation of our natural resource base; and
- Driving far greater involvement in, and support by sector departments and provinces in municipal spatial development planning, to ensure (1) the preparation and use of progressive, quality municipal SDFs, and (2) the enforcement of land-use policies and rules emanating from such SDFs in municipal Land Use Management Systems (LUMSs), as provided for in SPLUMA.

4.4 National Spatial Development Levers

In order to (1) give spatial expression to the **National Spatial Development Vision**, and (2) support the shifts that need to be made in accordance with the new **National Spatial Development Logic**, a series of **'National Spatial Development Levers'** were developed. These levers have their home in:

- The contextual realities, challenges and opportunities, as set out in **Part Three**;
- The drivers, levers and principles as set out in the NDP, the IUDF and SPLUMA (see **Sections 1.3.2** and **4.3**);
- What is considered *'good spatial and settlement planning'* in local and international planning policy frameworks, guidelines and practice; and
- The theoretical domains of spatial development planning, urban design, regional and rural development planning, institutional economics, agglomeration economics, and ecological resource planning and management.

Six such **National Spatial Development Levers** were developed. Each of these is discussed below (see **Figures 31** and **32**).

Figure 31: National Spatial Development Levers

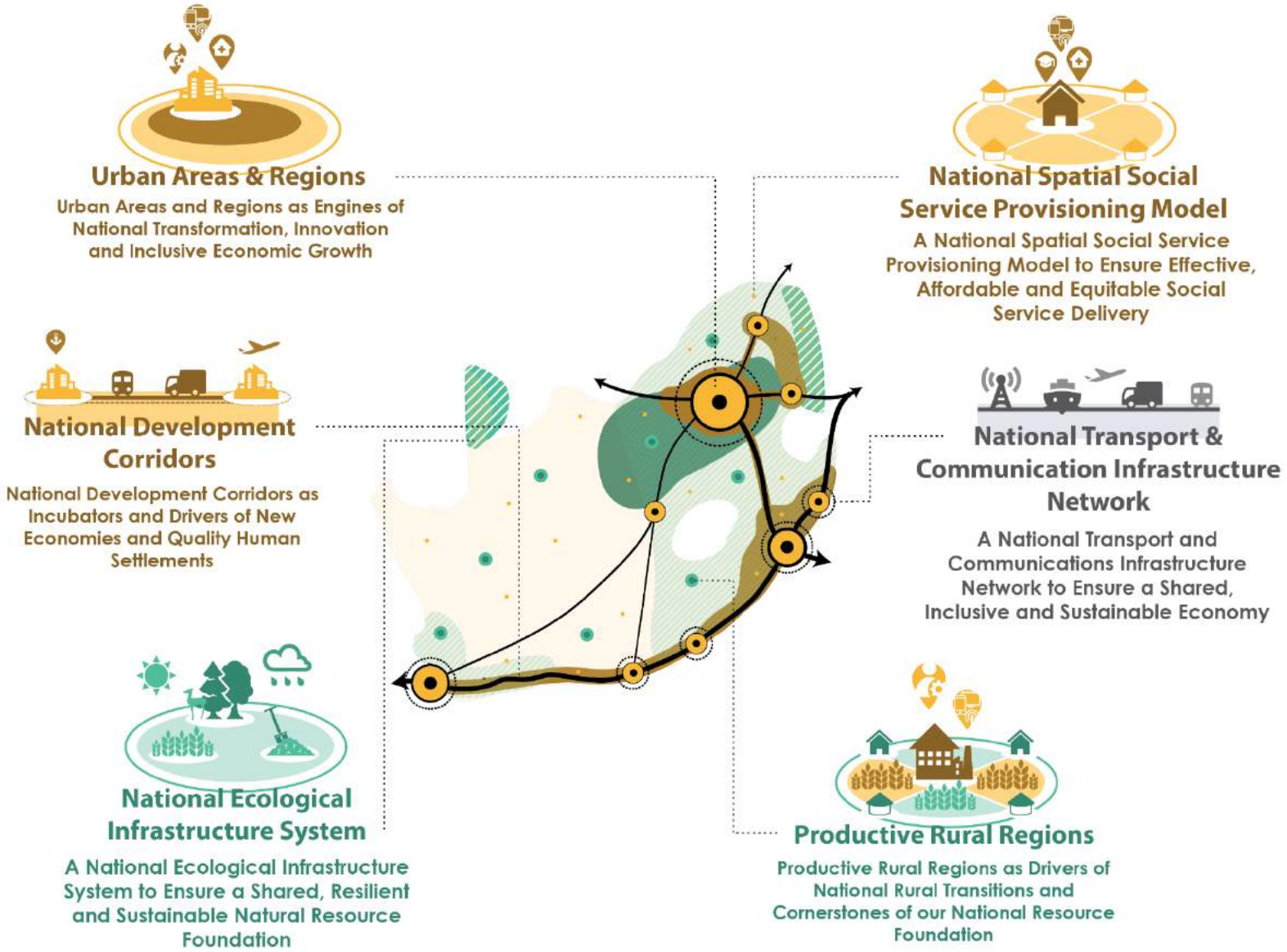
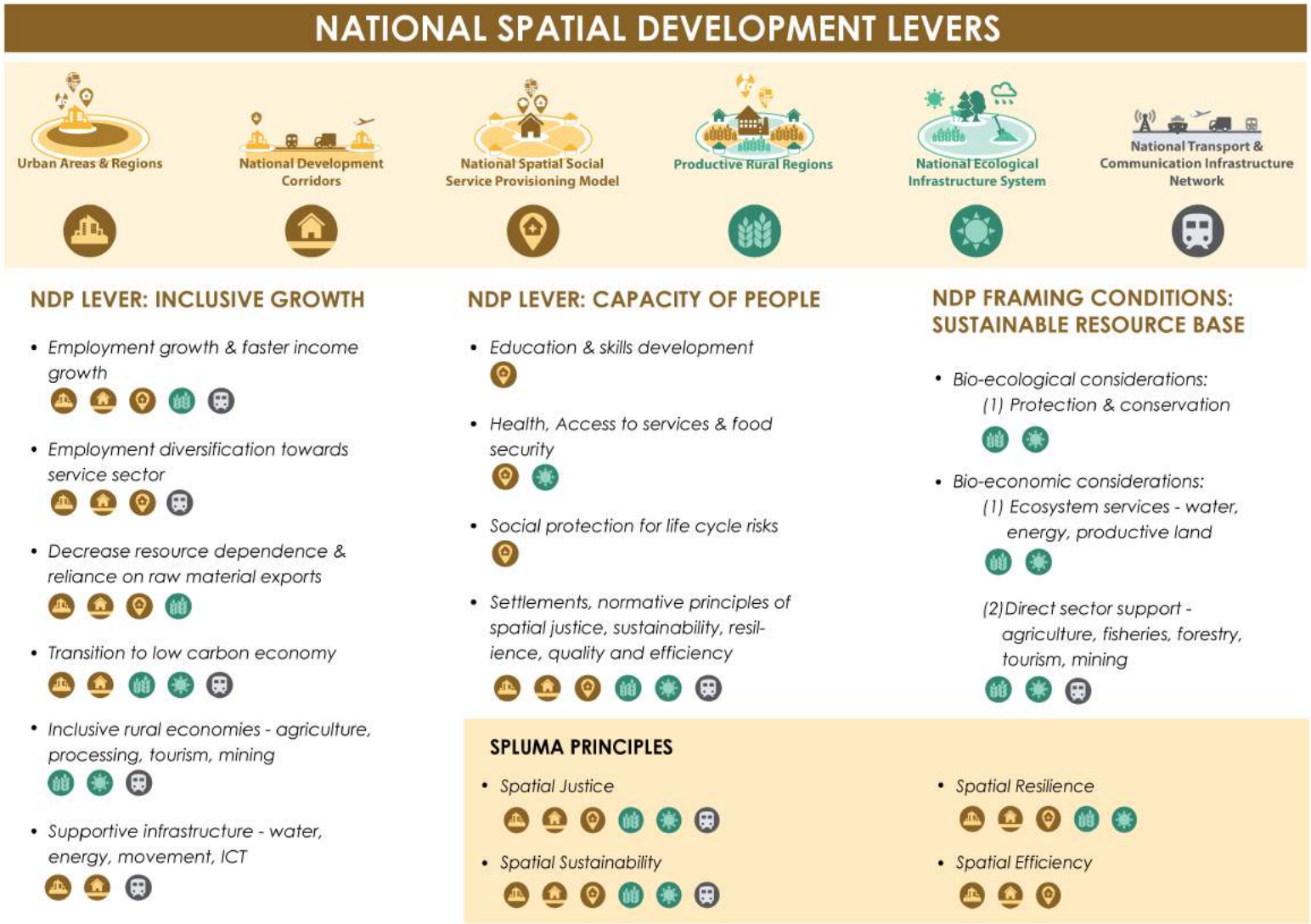


Figure 32: Linking National Spatial Development Levers to the NDP and SPLUMA



Please note: NDP Lever 'Capable State' and SPLUMA Principle 'Good Administration addressed in Implementation Framework

4.4.1 Urban Areas and Regions as Engines of National Transformation, Innovation and Inclusive Economic Growth

The IUDF argues that, "… *in the economic history of humanity, urbanisation has always been an accelerator of growth and development, bringing about enormous changes in the spatial distribution of people and resources, and in the use and consumption of land*". With nearly 70% of South African's population already living in cities and towns, and this figure set to rise to 80% by 2050, the NSDF shares this view, and argues that **urban areas** will play an increasingly important role in the development of a shared and sustainable South Africa. Urban areas will replace commodities as South Africa's 'new gold'. The NSDF does, however, hold that urban areas will only be able to perform this critical and desired role if:

- There are *high levels of inter-connectivity* between the country's city regions, cities and towns, and they are all tightly integrated into a mutually beneficial and resilient *national urban settlement network* (see also **Section 4.4.6** below);
- The *benefits of agglomeration in urban areas* are allowed to surface and flourish through (1) fast-tracked urban land reform and land release, (2) effective settlement planning, design and management, including growth management, (3) the introduction of regulations and land use management systems that focus on strategic and not petty matters, (4) densification, diversification and quality public place-making, (5) the provision of basic municipal and social services in a financially viable way, (6) the provision and use of effective public transport and non-motorised bicycle lanes and walkways, (7) stringent water demand and waste management, (8) the creation of safer environments, and (9) the provision of effective policing services; and
- *Regional-level urban development corridors* between (1) cities and towns in urban regions, as well as (2) existing and emerging nodes within cities and towns (such as between township nodes, suburban nodes and Central Business Districts) are planned, developed, supported and strengthened.

4.4.2 National Spatial Development Corridors as Incubators and Drivers of New Economies and Quality Human Settlements

National Spatial Development Corridors are large stretches of densely-populated human settlements and intense economic activity along/on roads and/or railway lines. The dense human settlements, the road/railway links and the intensive economic activities mutually support each other in a synergistic way. While such corridors often develop organically over long periods of time, they can be supported and strengthened, and their development fast-tracked though well-considered and targeted State interventions. Interventions of this nature typically entail (1) the strengthening of the economy or the housing market in cities and towns in the corridor, (2) the construction of new, or the expansion and/or upgrading of existing road

and railway links in the corridor and/or (3) the provision of targeted incentives to support denser, more concentrated development in corridors with more sprawling settlement patterns.

The NSDF regards **National Spatial Development Corridors** as potentially powerful national spatial development levers, especially (1) along coastal-based tourist routes, and (2) in former Bantustan areas marked by dense, yet sprawling human settlements along roads and/or railway lines.

The development of such *mega-scale* **National Spatial Development Corridors** will, however, require:

- Intensive and sustained *broad-based, multi-sectoral intergovernmental and SOE-collaboration,* especially so with regards to the quantum, timing and spatial location of (1) land to be released for use/settlement, (2) infrastructure investment, upgrading and maintenance, (3) and social service provision;
- The development of urban areas in the corridor in accordance with the *requirements for urban areas* as set out in **Section 4.4.1** above; and
- The *availability of viable, real economic opportunities,* which would ideally not be based on a single economic sector, to (1) enhance resilience, and (2) increase the prospect of developing robust and diverse economies based on these opportunities.

4.4.3 Productive Rural Regions as Drivers of National Rural Transitions and Cornerstones of our National Resource Foundation

Rural areas, especially in the former Bantustans, (1) were zones of extreme neglect, and at the receiving end of the worst excesses of large-scale commercial farming, mining activities and urban-based manufacturing economies *during colonial and Apartheid times,* and (2) *have of late* been the sites of often well-intended, but piece-meal, unintegrated and fragmented spatial and economic development initiatives.

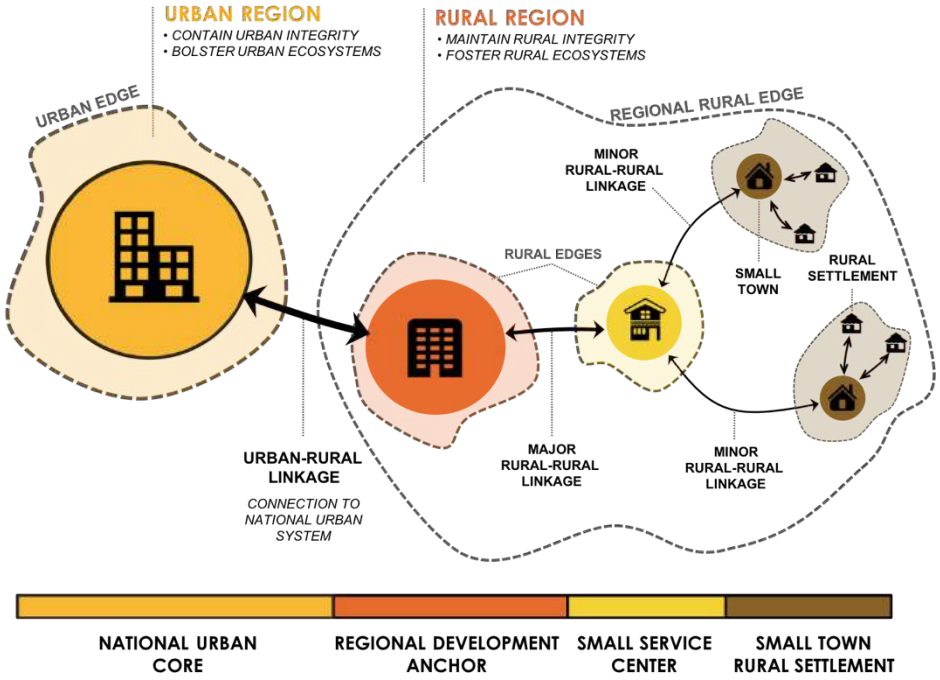
The NSDF puts forward a **Regional-Rural Development Model** (see **Figure 33**) as a third **National Spatial Development Lever**. This model:

- Takes a systemic *view of rural areas*, and proposes the 'soft delineation' of '*polycentric functional rural regions'* that have (1) at least one well-connected regional development anchor, both within the region on the national transport network to 'anchor' the region in the national space economy, (2) social, cultural, historical, economic and cultural characteristics and attributes that would make the development of a 'functional rural region' possible over time, and (3) the potential for *intra-regional trade* between towns and villages in the region;
- Proposes the preparation of *regional-rural development plans,* as the DRDLR has already begun to do in rural South Africa, for these regions, and include the projects and plans that are

identified in these plans in the IDPs and SDFs of the municipalities in whose areas of jurisdiction the regions fall;

- Requires that *land reform* be fast-tracked and undertaken within the framework of the regional-rural development plan, to ensure that suitable and well-located (1) agricultural land, and (2) stands in towns, are sought and released for productive purposes, and that the necessary support for beneficiaries (inputs, fencing, equipment, markets, finances, etc.) is properly planned for and undertaken in a systematic, structured and effective way;
- Requires *wise natural resource use*, management and protection;
- Utilises the **Social Service Provisioning Model** (see **Section 4.4.4** and **Figure 34**) to (1) *provide social services* in villages, towns and regional development anchors in accordance with their role and place in the rural region, in the most effective, sustainable and affordable way, and (2) create at least one regional development anchor/town to attract and retain professionals and entrepreneurs who would otherwise generally not move to, or stay in rural areas;
- Envisages *the use of 'rural edges'* (see **Glossary of Terms**) to protect the rural regions from intrusion of non-compatible and destructive land uses that could (1) disrupt or violate the rural integrity of the region, (2) compromise ecosystems on which the region relies, and (3) threaten local lifestyles and cultures in the region; and
- Depends on local people being duly empowered to become active participants in the development of their areas, and hence makes a move away in rural development thinking and practice from an approach of *'transformation-from-above'* to one of *'transformation-from-below'*[viii].

Figure 33: Schematic Presentation of a Regional-Rural Development Model



4.4.4 A National Spatial Social Service Provisioning Model to Ensure Effective, Affordable and Equitable Social Service Delivery

The realities of (1) national fiscal constraints, (2) the high construction, maintenance and staffing costs of social services, and the (3) general inward focus in requests and proposals in municipal IDPs and SDFs for the placing of *national* and *provincial* social service facilities, require that a rational allocation of facilities rendering social services be done in national space. In addition to this, investment in social infrastructure, if (1) planned well, (2) designed for multiple uses, and (3) placed in 'the right location/spot', e.g. on public transport routes, and in a place where adequate municipal services are available, in a village, town or city, can become:

- An *attractor* for economic activities and contribute to place-making, urban densification and diversification; and
- A *catalyst* for nodal development, and assist in reducing transport costs and limiting urban and rural sprawl.

The provision of social services is also a creator of public sector jobs with secure incomes, which can assist in bringing a degree of predictability to the frequency and size of disposable income in a region or town. In rural areas, where settlement development was often not planned, the preparation of a proper 'rural design framework/plan' and the placing of government services in accordance with this framework/plan, could greatly assist in developing rural towns/settlements with solid, resilient public investment/capital structures.

The **National Spatial Social Service Provisioning Model** (see **Figure 33**) put forward in the NSDF as a **National Spatial Development Lever**, works on a hierarchical base, with the highest order services with the largest spatial reach in each category (see **Figure 34**), being placed in the highest order places [ix]. In for instance the case of health care, regional hospitals would be placed in *'national urban cores'* and *'regional development anchors'*, and mobile clinics in small villages. Likewise, universities would be located in *'national urban cores'*, high schools in *'rural service centres'*, and small schools and mobile libraries in villages.

While rather rigid in appearance, the model *does not propose an iron-caged spatial investment model,* but instead envisages a situation by which municipalities and national and provincial sector departments would use the *'national and regional settlement and service network'* or *'social service wheel'* for short, as strong indicator and guide in *jointly engaging and deciding on* the spatial allocation of facilities across space. In addition to this, the wheel could also be used to:

- Avoid and resolve intergovernmental disputes regarding the spatial location of social service facilities;
- Inform, structure and guide engagements by communities with government regarding the provisioning and spatial location of social services; and
- Engage and 'interrogate' spatial investment decisions by national and provincial sector departments and municipalities regarding social services in accordance with the NSDF's envisaged *'national spatial accountability model'* (see **Parts 5** and **6** of the NSDF).

Figure 34: A National Spatial Social Service Provisioning Model ('Social Service Wheel")

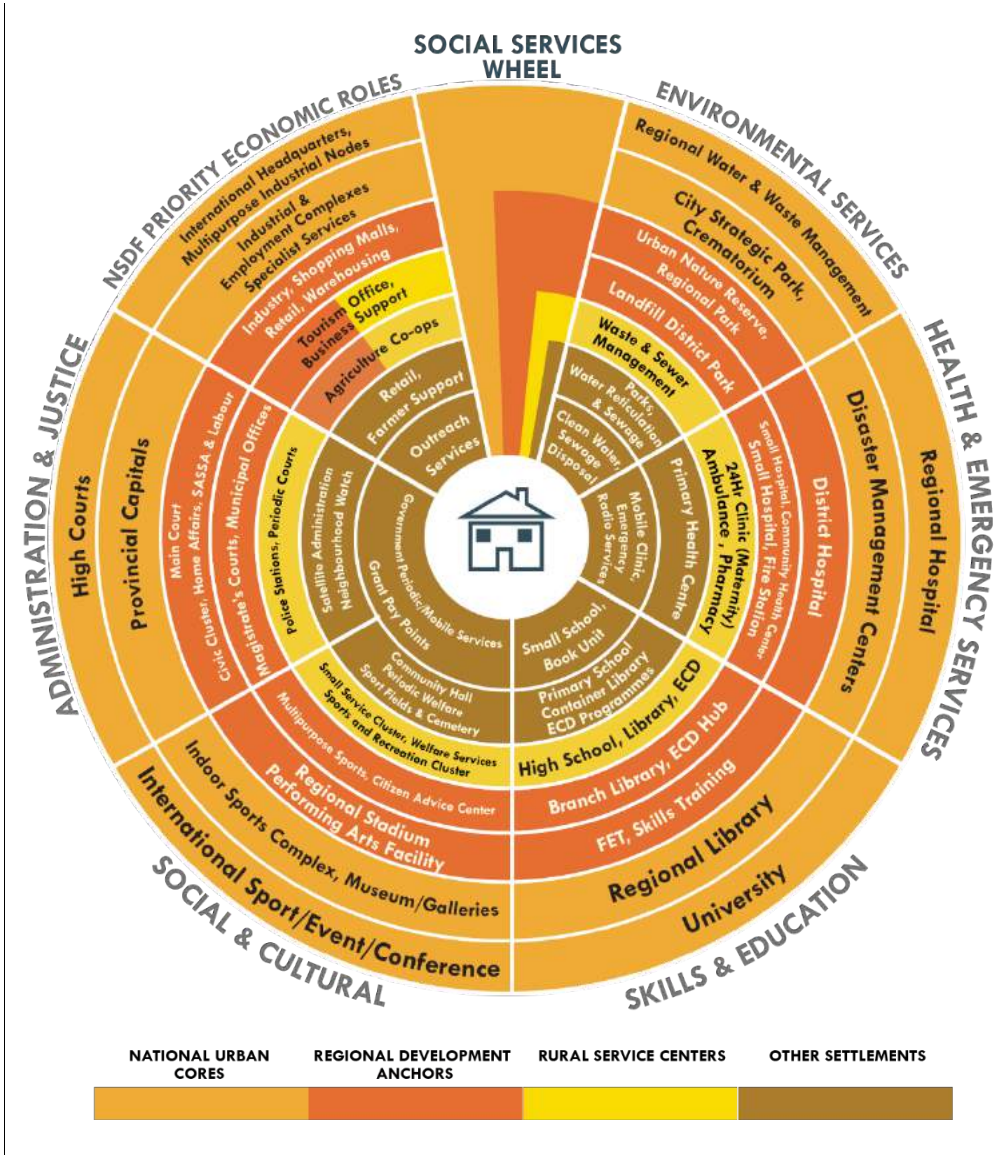
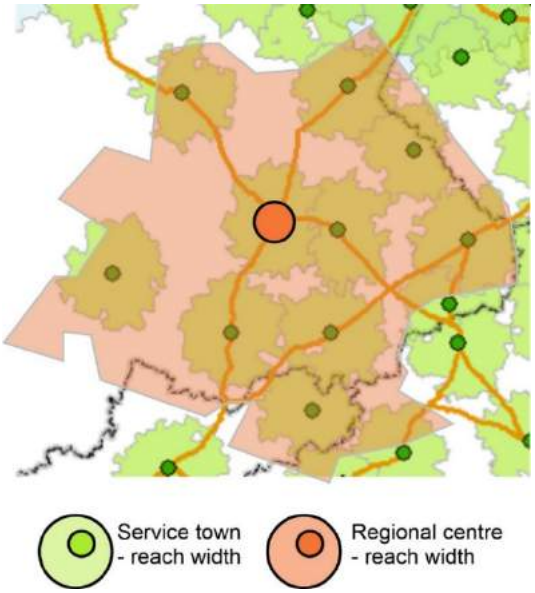


Figure 35: Illustration of Town Service Reach



4.4.5 A National Ecological Infrastructure System to Ensure a Shared, Resilient and Sustainable National Natural Resource Foundation

It is both a (1) national spatial development and (2) human rights imperative to ensure sustainable and just access to natural resources for current and future generations. The **National Spatial Development Vision** recognises this, and specifically refers to the need for our country's natural resources to be shared and used by all in a sustainable manner. In order to give spatial expression to this imperative, the NSDF puts forward the introduction of a **National Spatial Ecological Infrastructure System** as a *national spatial development lever* in recognition of:

- The *limited availability of high-value agricultural land*, and seeks to ensure that this resource is identified and managed with the utmost of care to ensure national food security;
- The *high levels of regional interdependency between water catchment areas and* the enormous volumes of *water transfers* in the country, and hence the need to protect (1) *surface water production catchment areas* from encroachment by non-compatible land-uses, as well as (2) *underground water sources* from contamination by noxious economic activities; and
- The major changes in *land suitability and habitability* that extreme climate change is set to bring to our country, and hence the need to identify those areas that will most likely be least affected by climate change, and ringfencing, preserving and protecting these areas for (1) future (emergency) use for water and food production, and (2) the provision of crucial national ecological ecosystem services.

The **National Spatial Development Lever** put forward in the NSDF in this regard *seeks to (1) identify those areas of crucial national ecological significance, and (2) propose measures to ensure their protection and management, and their reservation as such,* in all provincial, regional and municipal SDFs to be prepared from hence forth.

4.4.6 A National Transport, Communications and Energy Infrastructure Network to Ensure a Shared, Inclusive and Sustainable Economy

A well-functioning and well-managed *national transport and connectivity infrastructure network* that ensures and enables (1) the safe and efficient movement of people, (2) the flow of information and communication, (3) the movement of goods and flow of services, (4) global connectivity and interaction in the global economy, is crucial to the spatial development and economic life of any country. Given (1) the *high costs* associated with the construction, upgrading and maintenance of such networks, which include airports, harbours, border posts, logistic hubs, electricity, fiber networks, broadband, natural gas pipelines, and road and rail networks, and (2) *the need to recover such costs through use*, a country has to carefully plan where these networks are to be built/installed. In the case of South Africa, *the legacy of historic national development paradigms* in terms of which such networks supported first colonial extraction and export, and later the creation of the Apartheid State for a White minority, requires that these networks be

strategically planned, built and maintained in support of *post-Apartheid spatial transformation and inclusive economic growth.*

The **National Spatial Development Lever** put forward in the NSDF with regards to transport and communications infrastructure networks, seeks to ensure:

- Investment in *maintaining, strengthening and expanding connectivity,* to ensure the creation of a solid transport and communications network between urban areas, regional development anchors and smaller towns and villages in such regions, with a focus on (1) ensuring the roll-out and continuous upgrading of broadband access to all South Africans, and (2) prioritising rail over road infrastructure;
- More *people-focused infrastructure investment,* such as (1) upgrading infrastructure networks in major urban areas and towns, to accommodate far higher densities and intensities, (2) installing and maintaining infrastructure networks in former township areas at scale, so as to develop these previously neglected areas into high-quality urban living spaces, and (3) developing quality public spaces, pedestrian walkways and efficient, affordable and safe public transport networks for use by all;
- More *upgrading of ageing urban municipal service infrastructure* and large-scale investment of municipal infrastructure in regional development anchors and rural service towns; and
- More investment in the *enabling and catalytic infrastructure* required for (1) renewable energy generation, storage and distribution, (2) smallholder farming and agro-processing, (3) tourism, culture and entertainment-led economic growth, and (4) innovation and knowledge-creation, packaging and transfer.

4.5 National Spatial Development Outcomes

4.5.1 Introduction

This section outlines a series of *five* **National Spatial Development Outcomes** that *must* and *will be* accomplished by (1) making the shifts as set out **Section 4.3**, and (2) using the **National Spatial Development Levers** as set out **Section 4.4**. These outcomes, each of which is briefly described in the following five sections, connect the **National Spatial Development Vision** and **Logic** in this part of the NSDF (**Part Four**) to the desired **Post-Apartheid National Spatial Development Pattern** as set out in **Part Five**.

4.5.2 National Spatial Outcome One

A network of consolidated, transformed and well-connected national urban nodes, regional development anchors, and development corridors that enable South Africa to derive maximum transformative benefit from urbanisation, urban living and inclusive economic development.

In terms of this outcome:

- Consolidated and quality settlements are provided with the necessary social and economic infrastructure for a fast-growing population in a way that considers (1) all our available natural and man-made resources, and enabling and empowering technologies, and (2) the need to provide for both current and future generations;
- National urban regions and nodes act as national and global gateways for trade, tourism and national political functions, and gateways for African and regional integration;
- High-density urban nodes provide opportunities for interaction, innovation and enterprise development within existing, as well as new, inclusive and interaction centred enterprise economies;

- A well-developed service infrastructure system acts as basis for just access to high quality social and other services in:
  - A *strong and well-functioning polycentric system* of well-connected urban core areas within wider functional urban regions and corridors that offer a wide range of high-order medical, education, government, safety and security, trade-gateway and economic services is put in place; and
  - A network of vibrant regional development anchor towns, with strong rural-rural connections to strategically located rural service towns that act as regional-rural service providers, is created.

4.5.3 National Spatial Outcome Two

National corridors of opportunity enable sustainable and transformative national development, urbanisation, urban consolidation, mutually beneficial urban and rural linkages, and ecological management.

In terms of this outcome:

- Economic growth, consolidated settlement development and trade infrastructure and trade are located within well-connected inter-regional and national development corridors and routes;
- Urbanisation, settlement growth and the dynamically changing needs of a growing population are directed, attracted to, and accommodated in a system of national urban regions and nodes, with specific emphasis on *national-scale transformation and development corridors* that provide opportunities for regional adaptation through:
  - Settlement transformation and consolidation and inclusive urban economies;
  - Effective land-management and custodianship of national strategic water production and ecological sensitive areas; and
  - Sustainable eco-agri-enterprise activities and livelihoods.

4.5.4 National Spatial Outcome Three

National connectivity and movement infrastructure systems are strategically located, extended and maintained, to support a diverse, adaptive and inclusive space economy and a set key national and regional gateway cities and towns.

In terms of this outcome:

- The national transport, trade and communication network is aligned with, and serves the identified nodes and development corridors in a way that supports the development needs of our growing population though (1) effective support for the economy, (2) the delivery of quality services, and (3) growth in employment;
- All national road, rail, air, maritime and ICT networks and infrastructure are aligned and prioritised, based on the demand and volume of services, as well as future growth in identified areas;
- Transport and logistic links serve natural resource-based economies in areas focused on (1) the export of raw materials, and (2) processing-activities related to mining, agriculture, forestry and manufacturing;
- Local freight needs, movement, passenger transport infrastructure and management skills/capabilities are spatially aligned and phased to support identified nodes and connecting corridors;
- Effective development of all national ports of entry, including (1) upgrading and maintenance of logistics infrastructure and (2) the

provision of efficient customs services, is ensured, to support the international and regional flow of goods, services and people;
- National water and energy-distribution infrastructure is expanded, upgraded and maintained to ensure national water and energy supply and distribution.

4.5.5 National Spatial Outcome Four

Productive rural regions, supported by sustainable resource economies and strong and resilient regional development anchors that provide access to people living in rural areas to the national and global economy.

In terms of this outcome:

- National food security, rural transformation and rural enterprise development and quality of life in rural South Africa are enabled and supported through a set of strong regional development anchors in functional regional-rural economies;
- Well-functioning, well-connected and productive rural regions (1) strengthen and enhance rural development and the well-being of rural communities, and (2) ensure the wise use, management and protection of nationally significant natural resources in these regions;
- Differentiated rural development (as called for in **Chapter 6** of the **NDP**) entailing small, medium and large-scale agriculture, agro-processing, agro-eco enterprises, tourism and natural resource management and protection, play a key role in creating economic opportunities, and addressing poverty, unemployment and inequality in these regions and the country as a whole;
- Large and strategically located smaller towns in rural areas with significant rural-regional reach in terms of social service provision, tourism, personal services and administrative functions, act *as* regional development anchors to support functional regional-rural systems;
- Urban consolidation and growth, innovation and context-specific access to housing and service opportunities, both in *sparsely-populated* and *densely-settled rural areas* is pursued through the identification and development of strategically-located 'regional development anchors'; and
- A set of well-connected, strategically located smaller towns act as 'rural service centres' to (1) ensure mutually beneficial *urban-rural* and *rural-rural* market linkages, and (2) provide distributed, but efficient access to critical social services and sustainable livelihood and settlement opportunities within diverse and productive rural regions.

4.5.6 National Spatial Outcome Five

National ecological Infrastructure and the national natural resource foundation is well-protected and managed, to enable sustainable and just access to water and other natural resources, both for current and future generations.

In terms of this outcome:

- The national water capture, storage and inter-regional transfer system is well-planned, funded and maintained, and, together with the introduction of far more stringent national, regional and local water-supply management measures, ensures (1) national water security and well-being, and (2) quality livelihoods for all;
- Ensuring water availability over the long-term takes centre-stage in well-aligned and integrated long-term national, provincial and municipal strategic and sector planning processes, and includes a focus on national and supra-national regional water-interdependencies;

- National ecological infrastructure and resources are protected and well-managed in officially protected national and provincial parks and ocean areas;
- National ecological and biodiversity management areas, as the foundation of our national ecological infrastructure system that sustains all life and livelihoods, are recognised as such, and protected by law; and
- In full recognition of our complex inter-regional and national spatial interdependencies, and the impact of spatial development on ecological resources and infrastructure systems, national spatial development and land-use is well-planned and effectively managed.

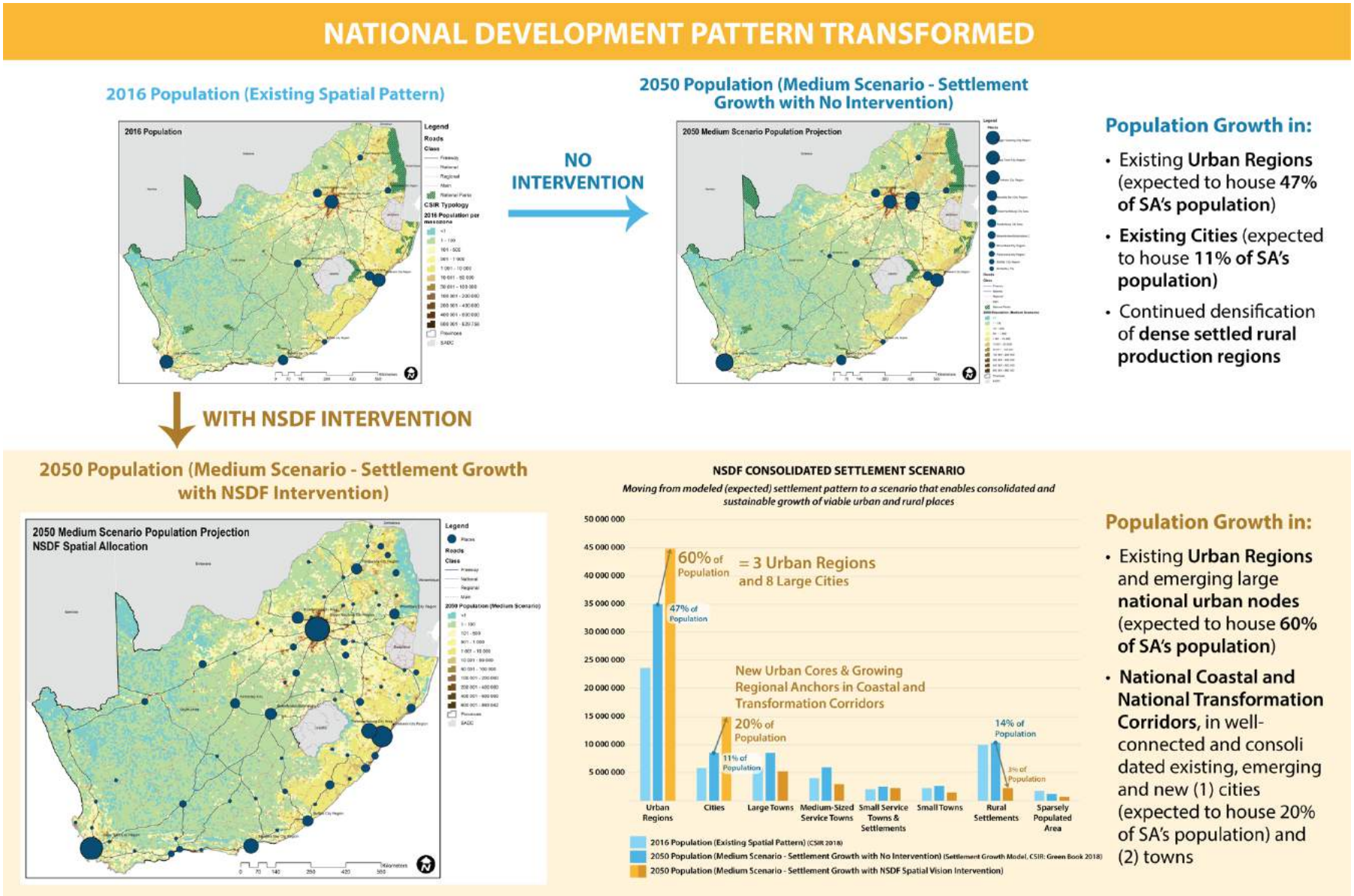
4.6 Putting it All Together: Life in South Africa 2050: The Long-Term National Spatial Development Vision, Logic and Levers in Action

In this section, the **2050-National Spatial Development Vision** as tangible expression of what the desired future will entail once the **Post-Apartheid National Spatial Development Vision, Logic** and **Levers** have been put into action, is presented. It reads as follows…

75 Million South Africans

It is April 2050. A year earlier, during South Africa's 55th *'27 April-Democracy Celebrations'*, the 75th million South African was born in the Buffalo City urban region. This massive urban conglomeration, is one of the 'big four' urban conurbations along the South African east coast, that are now jointly home to more than eight million South Africans. These four urban conurbations have grown rapidly – their growth equalling that of the Cape Town urban region, with its more than six million inhabitants. Despite their rapid growth, they are still a long way off from the Gauteng urban region with its population of more than 22 million people. Together with the booming cities of Polokwane, Mbombela, Rustenburg, Msunduzi and Mangaung, each with their populations of around 1 million people, the eleven urban conurbations are now home to around 42 million people, or around 60% of the South African population (see **Figure 36**).

Figure 36: National Spatial Development Pattern Transformed



Eleven Urban Conurbations

In contrast to days gone by in which large parts of metropolitan South Africa were described as lifeless and boring, these areas are now hives of activity. Three-to-six storey mixed-use buildings are the norm in the buzzing former inner-city areas and along dense activity-streets in many of the suburbs of these erstwhile cities. Rooftops are in most cases used for (1) food production, preparation and distribution, (2) pop-up music performances, (3) poetry nights, and (4) plays. Some of them are used for solar and wind energy generation, alongside a myriad of other ways of doing so (1) on buildings and verandas, and (2) in larger commercial energy farms on high-lying areas and in the ocean, alongside the numerous thriving aquaculture projects.

Trade with African countries along the east coast of the continent, as well as with India and China, has boomed over the last three decades. In contrast to days gone by, this is far less in the form of the export of raw commodities, some of which are no longer shipped, such as coal, due to international carbon-trade-bans dating back to the early 2030s. These days, South Africa is a major exporter of a wide range of high-value hand-made high-fashion clothing, jewellery, art, furniture, foodstuffs and beverages, which have become highly sought after in countries where nearly everything is made by machine. A key contributor to this new dawn for South Africa was the unveiling by government in the early 2020s of its massive and hugely successful '*Smart Reindustrialisation Programme*' and its '*Eastern South Africa Development Plan*'. Driven by (1) the evermore-pressing drought in the western and north-western parts of the country, (2) the unfulfilled and deferred promise of the democracy that was won at such a high cost, and (3) the enormous agriculture, industrial and settlement development opportunities that lay east, and that were unlocked by the massive '*New Land Reform Programme*' of the 2020s, government acted swiftly and decisively. And now, 25-30 years on, this is the outcome.

Transformation at Scale

The massive national-led '*macro-restructuring and development plans*' not only resulted in shared economic growth and poverty alleviation at scale, but also assisted in inculcating a culture of 'all-in', targeted, integrated and coordinated planning. Out the door went untargeted, unplanned and unintegrated investment by government and the private sector, and the wastage of time and money by everyone pursuing their own plans and projects in their own backyards. In contrast to the early days of SPLUMA, when the introduction of the new suite of spatial planning instruments had very little impact on ridding the country of the legacy of colonial and Apartheid planning, the Act is now (1) used as intended, and (2) respected by government, communities and the private sector alike.

In addition to the positive impacts the macro-restructuring and development plans had on the national spatial development planning system, the success of these plans assisted in making South Africans *believe that they can, and that it was possible to develop a truly transformed, liberated and prosperous post-Apartheid South Africa.* The fruits of this freed-up, confident country are everywhere to be seen – from the dynamic interplay between (1) well-targeted, wise government investment and (2) innovative, organic urban growth and land development by communities, to the booming SADC region. It is especially this regional bloc and the connections and free flow of goods, services and people that it has enabled, that have played a huge role in the national economic growth rate of on average between 3% and 6% since the mid-2020s. The benefits have not only been felt on the national level and in the big urban areas, as also smaller towns and rural areas have gained from it. *Thinking SADC, nationally and locally* when planning and investing in infrastructure, played a huge role in this success.

A Good Life in Urban South Africa

Life on the streets of urban South Africa is very different to the first two decades of the 2000s. In contrast to life back then, the streets are now filled with people and there is excitement in the air. There are now also far fewer cars in the streets, and all you hear is people's voices and music – walking and cycling are now the most popular means of moving around, and the electrical buses and taxis barely make a noise. Instead of pavements packed with cars, there now are (1) many small places to eat, (2) salons where you can have your hair done, (3) little shops selling anything from fresh produce to health foods, (4) research, education and innovation institutes, where knowledge and ideas flow freely, and (5) art and culture academies, where young artists are primed, and where you can enjoy music, poetry and short plays and buy paintings and sculptures. And it is here, in the vibrant streets and surrounding public spaces that never sleep, where many of the more than 75% of South Africans who now call 'the city' their home, *make a life and live much of their lives.* It is also here where South Africa and the rest of the world meet – where you see faces and hear languages from all over the planet. Many of these voices are those of tourists who love the vibrant and unique cosmopolitan atmosphere, and who have made South Africa one of the top ten tourist destinations in the world for the last 26 years in a row. Again, it was the foresight and decisive actions of government in the 2020s that succeeded in growing the sector into one of the largest and most dynamic in the country.

A Good Life in Rural South Africa

Rural South Africa is also in a very different shape to what is was in the late 2010s when it was a hard place to grow up in, money was tight, jobs were few and government services in many places non-existent or weak. This all started changing for the better when government launched its grant-funded *'National Spatial Restructuring Priority Plans'* in the early 2020s, with their focus on developing *'functional rural regions'* throughout rural South Africa, and which entailed the carefully planned roll-out and provision of quality services in each of these regions in a systemic way in accordance with government's so-called *'social services wheel'*. In many rural towns, there are now clinics, police stations, schools, arts and culture academies and sporting facilities, and even the smallest villages have lightning-fast communication networks. Hundreds of thousands of graduates deployed over the many years as interns, researchers, and tutors to rural schools, also assisted in making these plans a success. Very soon trade connections between smaller places in rural South Africa started growing, which soon saw the development of strong rural regions in areas where once there was little else but destitution and despair. At the same time, with the growing movement of millions of retired South Africans to rural areas, the economies of these places have been given a strong and stable financial injection.

A Young, Free and Creative Country

Today, 56 years into democracy, South Africa is finally beginning to enjoy the full dividend of freedom and is fully able to (1) harness the energy, creativity and vitality of its many young people, and (2) fuse it with the innovative flares and creative blazes of young people from the rest of the continent and all over the world.

Figure 37: Putting it all together

MAKING A LIVING AND ENJOYING LIFE IN VIBRANT, HIGH-QUALITY PLACES

- **Trade** with Africa, India and China with a focus on export: high-value hand-made high-fashion clothing, jewellery, art, furniture, foodstuffs and beverages
- Growth in the **SADC region** with free flow of goods, services and people

- Development of **Strong Urban Regions** in Gauteng, eThekwini and Cape Town
- **Vibrant urban areas** with mixed-use buildings, dense pedestrian and cycling-friendly activity-streets, and rooftops used for food production, pop-up music performances, poetry nights, plays and solar and wind energy generation that have become major tourist attractions

- **Strong rural regions** with trade connections between smaller places
- Carefully chosen **rural service centres** with clinics, police stations, schools, arts and culture academies and sport facilities, and lightning-fast communication networks

PART FIVE: National Spatial Development and Investment Guidance

5.1 Introduction

In this part of the NSDF, the desired **Ideal National Spatial Development Pattern for South Africa in 2050** is put forward. The **National Spatial Development Frame: Ideal National Spatial Development Pattern** (see **Figure 39**) provides an image of a:

> *Resilient, sustainable and inclusive post-Apartheid national spatial development pattern that is well-served by a consolidated system of international, national and regional development nodes and corridors, with a highly productive network of rural regions, where development nodes, rural regions and hard infrastructure are embedded within the capabilities and interdependencies of the national ecological infrastructure system.*

This ideal pattern is 'detailed-out' in five **'Sub-Frames'**[x]. These five **Sub-Frames** are:

- **NSDF Sub-Frame One:** Inter-Regional Connectivity;
- **NSDF Sub-Frame Two:** The National System of Nodes and Corridors;
- **NSDF Sub-Frame Three:** The National Resource Economy Regions;
- **NSDF Sub-Frame Four:** The National Movement and Connectivity Infrastructure System; and
- **NSDF Sub-Frame Five:** The National Ecological Infrastructure and Natural Resource System.

This **Ideal National Spatial Development Pattern** and the five **Sub-Frames** were constructed:

- In *adherence* to the priorities of the **National Development Plan** and the **SPLUMA principles;**
- In *accordance* with the **National Spatial Development Vision** and **Logic;**
- By *making use* of the **National Spatial Development Levers**; and
- In *pursuit* of the **National Spatial Development Outcomes** (see **Figure 37**.

Key **considerations** in constructing this **ideal National Spatial Development Pattern** and the five **Sub-Frames** were:

- National spatial development *realities* and national and international *trends, movement patterns and technological advances,* and (1) the challenges they present, and (2) the opportunities they offer;
- A significant growth in our *national population* of between 17 and 22 million people between today and 2050;
- The (1) unique *development potentials of places and areas,* and (2) the *roles* they will have to play in national, regional and local economies, to realise our national development objectives of inclusive economic growth, job creation and poverty eradication;
- The need to (1) safeguard *national food security*, (2) make the transition to a *low-carbon energy future*, (3) ensure *adequate provision of safe and affordable water*, (4) protect, manage and maintain *key ecosystems and the services* they provide, and (5) recognise the *interconnectedness and interdependencies* between places; and
- The multiple threats associated with *climate change,* such as (1) rising temperatures in the western and central parts of the country, (2) reduced water availability, and (3) growing unpredictability in the seasonal pattern of rainfall.

Together, the **Ideal National Spatial Development Pattern** and the five **Sub-Frames provide**:

- A **national spatial schema** to *inform, direct, prioritise and guide* all future infrastructure investment and development spending decisions by government and the private sector, to (1) optimise place-based potentials and spatial interdependencies, and (2) realise the **2050-National Spatial Development Vision** and our core national development objectives, as encapsulated in our **National Development Paradigm**;
- **Strategic spatial development and investment guidance** to *spatially direct* plans, budgets and actions of public and private sector actors, to, over time (1) *capitalise* on key national spatial assets, locational potentials and agglomeration opportunities, and (2) b*ring about* decisive, rapid, sustainable and inclusive national development and transformation at scale;
- A carefully chosen, *distinct set of* **nationally-significant places, connectors and areas** in and around which to *align, integrate and coordinate* investment by the private sector and the three spheres of government when preparing and reviewing (1) area/place-based provincial, regional and municipal SDFs, and (2) sector-specific and macro-infrastructure national and SADC-focused investment plans;
- A brief outline of the **key role-players** responsible for *driving spatial transformation, national adaptation and 'national spatial development accountability',* as well as (1) the institutions that will be involved, and (2) the instruments that will be used in all three these regards; and
- A **spatially-explicit assessment and accounting frame** for *monitoring and evaluating* all spending and investment decisions by government and the private sector in *space* (specific places and interrelated spaces) and *time* (the short, medium and long-term).

Following on from the ideal spatial pattern and the sub-frames, is a set of five **National Spatial Action Areas (NSAAs)**. These NSAAs represent the *most urgent strategic spatial development catalysts* to (1) bring about radical spatial transformation at scale, and (2) manage and mitigate rising national risks, and as such, *require immediate national action*. *Concerted and sustained intergovernmental collaboration* is required in these **NSAAs** over the short term to:

- Target context-specific, focused and catalytic *national spatial development interventions*; and
- Kickstart the process of aligning plans, budgets and departmental plans in and between spheres of government around *national spatial development priorities.*

Figure 38: From the Ideal National Spatial Development Pattern to the NSDF Sub-Frames

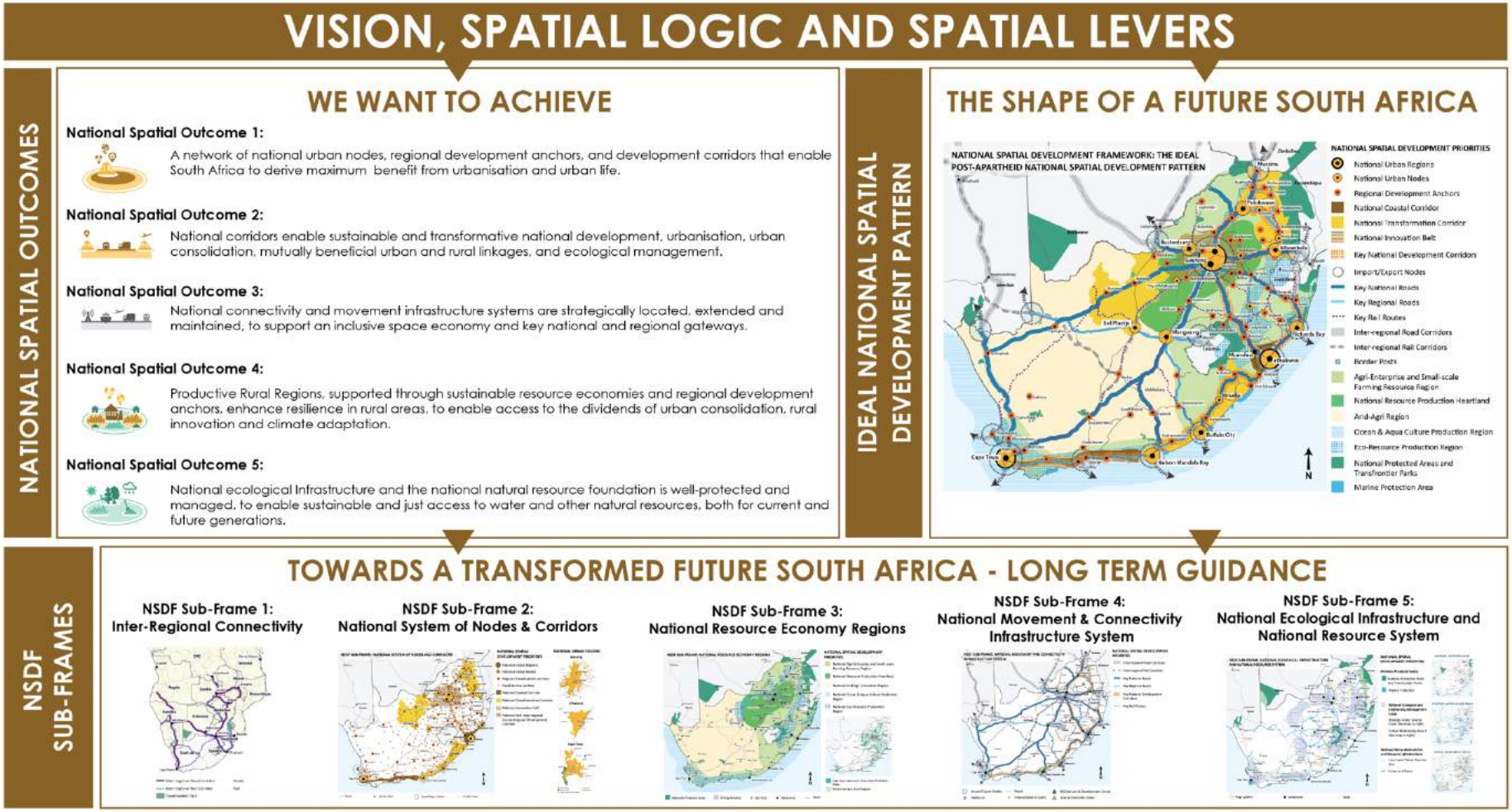
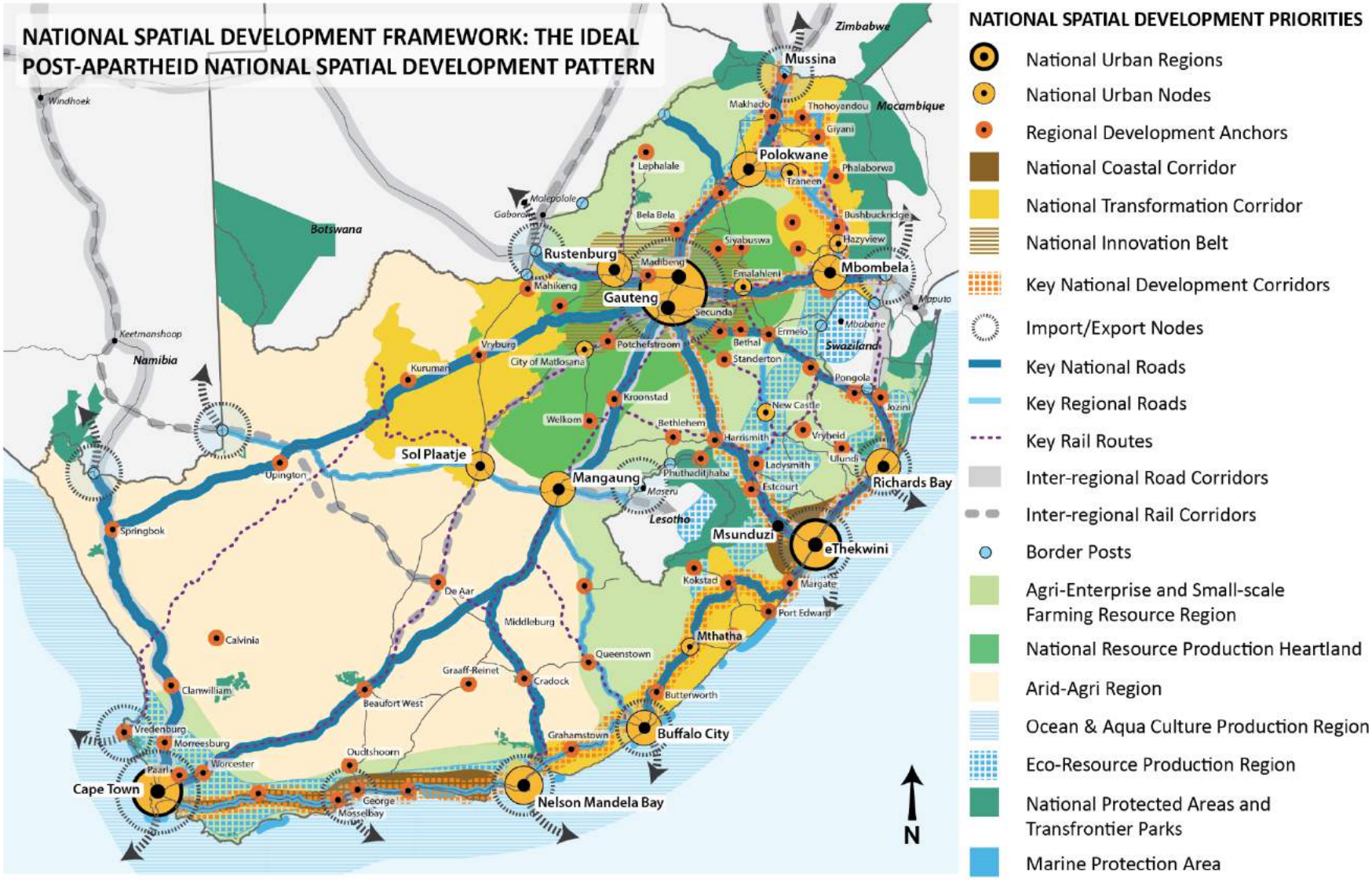


Figure 39: National Spatial Development Framework: The Ideal Post-Apartheid National Spatial Development Pattern



5.2 NSDF Sub-Frame One: Inter-Regional Connectivity

5.2.1 Spatial Development and Investment Guidance

Supra-national development and investment in four inter-regional spatial networks are of particular importance to South Africa (see **Figure 40**). These relate to (1) *energy supply*, (2) *transport and logistics services*, (3) *shared water resources, and (4) ecological infrastructure:*

- **Regionally-connected electricity networks** enable South Africa to (1) buy electricity from Lesotho, Mozambique and Namibia when surplus is required, or (2) sell to Botswana, Lesotho, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe when it has excess production.[xi] The *SADC Energy Sector Plan* indicates that, apart from the infrastructure projects in South Africa, there are also a number of *planned* (or by now *current*) projects aimed at increasing power generation in the region.[xii] Nationally, these are also under consideration through the *Electricity Grid Infrastructure and Gas Pipeline Extension programme*, for which a national Strategic Environmental Assessment (SEA) process is currently underway. **Renewable energy** has emerged as a rapidly-growing source that can add vastly to the energy mix in the region. Renewable energy projects have, however, faced serious challenges related to a lack of (1) policy and regulation, and (2) connecting infrastructure and financing.

- **Transport and logistics infrastructure** has been identified as key to creating an enabling environment to (1) achieving the goal of sustainable regional socio-economic development, and (2) closing the widening gap in the provision of high-quality, efficient infrastructure, especially when considering road and rail infrastructure. In response to this, SADC adopted a spatial development corridor strategy in 2008. While railway lines are considered as crucial for (1) improved efficiency of movement of freight in the region, and (2) the protection of infrastructure investment in the regional road network, the railway network has seen only minimal improvement, revitalisation and expansion. Poor road quality and lack of maintenance in certain areas remain a critical concern in the case of both regional and urban roads. Although capacity currently exists on the road network, projections for 2027 suggest the need for (1) further road-widening, (2) the construction of bypasses for major cities and passing-lanes in hilly regions, and (3) more efficient border-posts.[xiii] While the SADC railways generally operate far below their original design capacities, they cannot increase their volumes because of (1) poor track condition, (2) lack of locomotive and wagon availability, and (3) low operating capital. With regards to new railway investments directly impacting upon or driven by South Africa, the TRANSNET rail investment plan indicates a new rail line to Botswana (the Lephalale-Mahalapye line) for coal transport, as well as the upgrading of several lines to the major regional harbours, to support mineral exports.

- **Water availability** across SADC varies. The countries with the greatest demand unfortunately also have the most limited supply. South Africa shares several water catchment basins with neighbouring countries including (1) the Orange-Senqu basin (Namibia and Botswana), (2) the Limpopo basin (Botswana, Zimbabwe and Mozambique), (3) the Inkomati basin (Swaziland and Mozambique), and (4) the Maputo-Usungo-Pangola Basin (Swaziland and Mozambique). It is projected that by 2025, two of South Africa's major river basins (the Orange-Senqu and the Limpopo basin) will be under stress, i.e. meaning they will have less than 500 cubic metres of water available per person

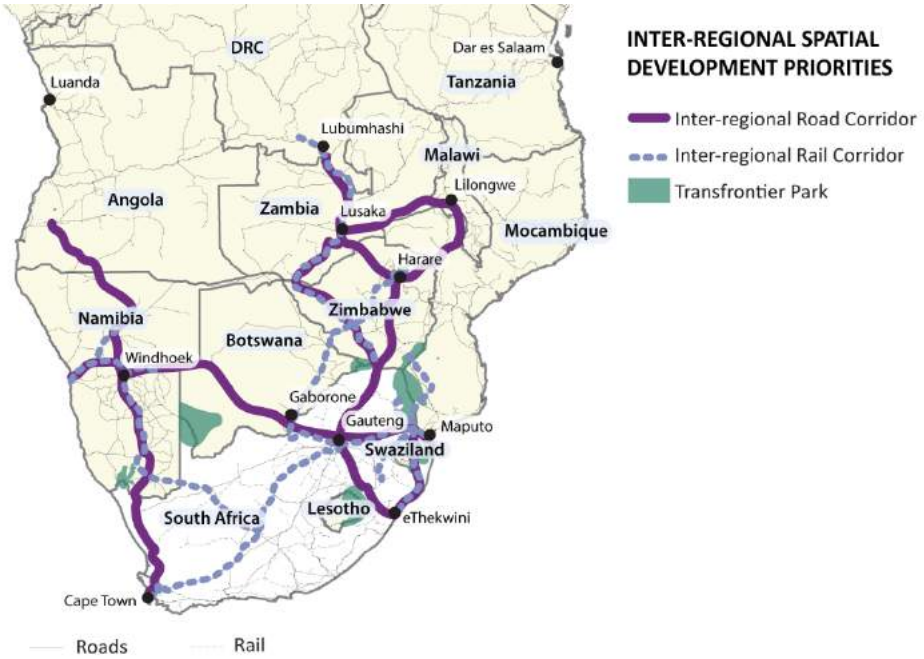
annually.[xiv] The SADC-Protocol establishes a legally-binding framework for transboundary water management in the region. Within the context of recent water challenges to sustain livelihoods, agriculture, mining, industrial and service economies in our country, the regional importance of (1) transboundary water management, and (2) sustained and enhanced biodiversity and natural ecosystems, including wetlands (which are also the bases for viable rural livelihoods and tourism) is clearly evident.

- **Ecological infrastructure** management and collaboration regarding risk management and beneficiation associated with identified strategic national protected and management areas within SADC is of critical importance for South Africa to reach national development objectives and international agreements.

The priorities related to supra-national cross-border and regional inter-relations can be summarised as follows:

- Facilitation of *trade and movement* in the SADC trade bloc;
- Strengthening and expansion of South Africa's role in facilitating inter-regional trade and providing *regional gateways* (i.e. our core urban regions and nodes) (see **NSDF Sub-Frames 2** and **3**);
- Protection of *strategic regional ecosystems and bio-diversity* through shared management of International Transfrontier Parks; and
- Effective and efficient management *of cross-border movement*, service delivery and inter-regional migration.

Figure 40: NSDF Sub-Frame One: Inter-Regional Connectivity



5.3 NSDF Sub-Frame Two: National System of Nodes and Corridors

5.3.1 Spatial Development and Investment Guidance

Settlement development, both in *urban and rural South Africa*, must be undertaken in such a way that it (1) increases development density, (2) reduces urban sprawl, (3) prevents the unsustainable use of productive land, and (4) optimises investment in infrastructure networks (see **Figure 41**).

Inclusive economic development, livelihoods, land and housing: In accordance with this objective, *municipalities, supported by provincial and national government sector departments,* must:

- Prepare and implement appropriate local and regional economic interventions;
- Enable and support a wide spectrum of livelihood opportunities;
- Ensure timeous identification, acquisition and release of well-located land; and
- Make provision for a diverse range of *housing options* for a diverse range of *household types.*[xv]

In *rural settlements,* it is imperative that (1) environmentally-sensitive settlement planning be undertaken, (2) *'rural design'* be introduced, and (3) viable, new agri-eco-focussed enterprises be established and existing ones supported.

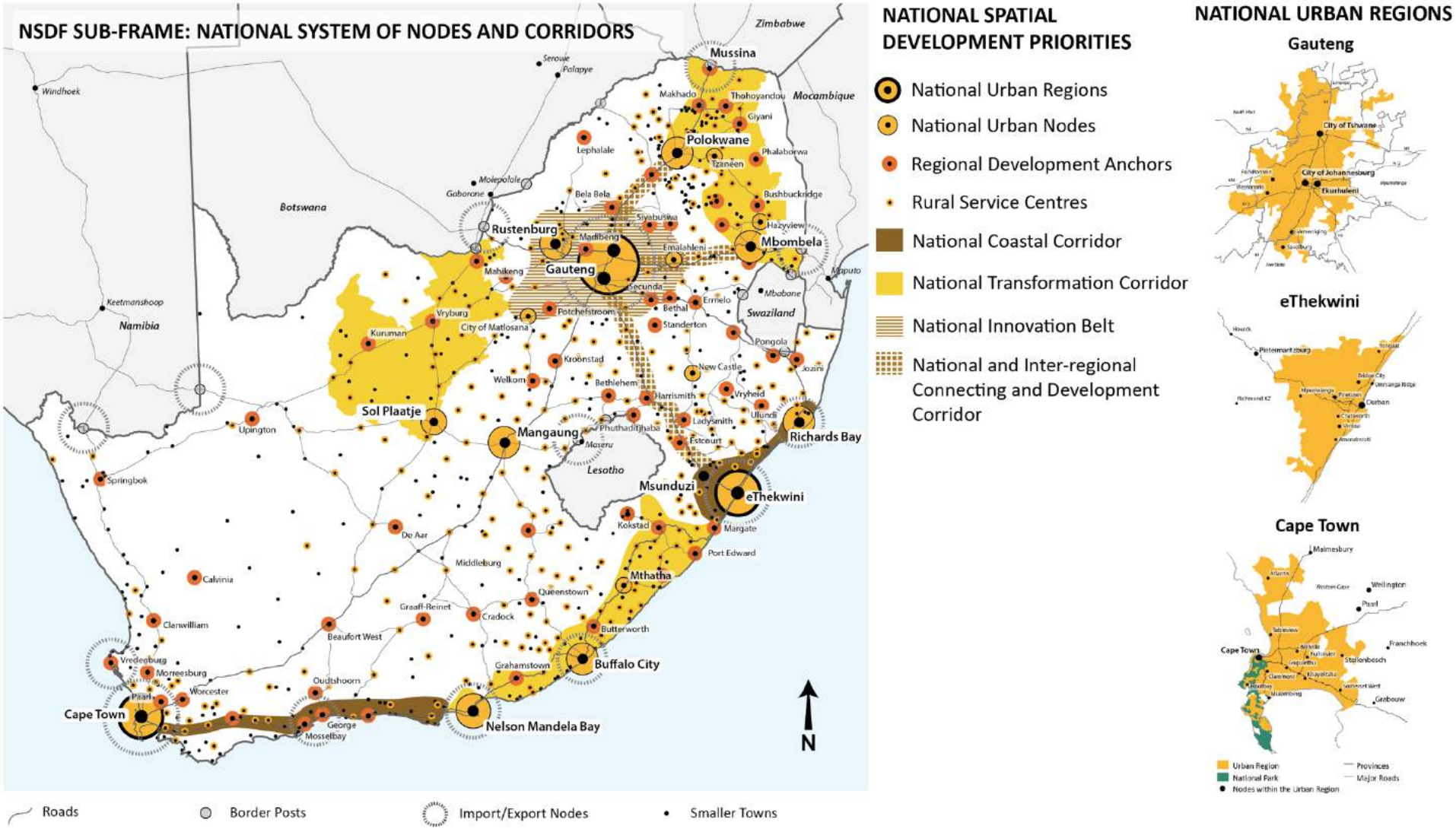
Social services and settlements: If South Africa is to meet the social needs of its *very young*, but also *increasingly older* population, then a rational process of providing social infrastructure is required. The NSDF is therefore underpinned by a *'national settlement service provision framework system'* in terms of which social services are provided in accordance with the (1) role and (2) service-reach of the type of settlement on the national settlement network. This system provides the basis for guiding investment in infrastructure and social services, especially by national sector departments (see **Figure 42**). However, this system will only work if government as a whole adopts it to guide its social infrastructure planning and investment. *As a starting point, it is recommended that priority be given to embedding this system in all of government.*

National and regional connectivity: The national network of nodes, smaller settlements and corridors requires that (1) national nodes and smaller settlements are well-connected to each other, and (2) national nodes are well-connected to the rest of the world though a range of transport modes and communications networks. This requires that:

- Road and rail routes that are of national importance be built, maintained and upgraded, as and where necessary;
- Rail be prioritised over road for freight movement; and
- The availability, affordability, safety and quality of mass public passenger transport be drastically improved.

Water availability: Given our dire water situation, water demand must be curbed, water sources must be augmented, and the little water we have, protected from loss through well-maintained infrastructure. In addition to this, (1) our ecological infrastructure must be protected and its use be well managed, and (2) new settlement development must be restricted and existing settlement growth carefully managed in water-stressed catchments and regions.

Figure 41: Sub-Frame Two: National System of Nodes and Corridors



5.3.2 National System of Nodes: Spatial Development and Investment Priorities

Spatial Development and Investment Guidance	National Spatial Development Priorities
National Urban Regions (see **Figure 41**) • Consolidate urbanisation in compact, productive, sustainable, inclusive and well-governed urban core regions. • Prioritise infrastructure maintenance to mitigate against the expected impact of natural and climate change-related hazards on large numbers of people, especially the poor and most vulnerable members of society, and avoid repetitive infrastructure-repair costs. • Manage demand and maintain, expand and refocus our infrastructure network, to enable and sustain bulk water supply and energy distribution *within* and *to* urban regions. • Effectively utilise, protect and manage high-value agricultural lands, ecological infrastructure and national manmade and natural environmental assets, and mitigate down-stream impacts on water bodies, water catchments and other natural resources. • Actively support national and international programmes aimed at climate change mitigation of CO2-emissions, and introduce local policies and measures to assist such programmes. • Utilise innovation, enterprise development and job creation opportunities in (1) agro-eco-industries, (2) tertiary and service sectors, (3) tourism, (4) knowledge-creation, and (5) cultural and entertainment industries. • Maintain and upgrade road and rail routes in urban regions. Prioritise rail for bulk freight, and improve the affordability of intercity public passenger transport.	***Strengthen and Consolidate Existing Urban Regions, i.e.:*** • The Gauteng Urban Region; • The eThekwini Urban Region; and • The Cape Town Urban Region.
National Urban Nodes (see **Figure 41**) • Consolidate and direct the rapid population growth in the eastern half of the country to national urban nodes, clusters and corridors by creating (1) quality human settlements, and (2) centres of human capital excellence, innovation, trade, inclusive green economies and regional enterprises, and in the process *reaping the urban dividend*. • Within *distressed and sparsely populated areas* and areas that are *becoming increasingly more arid,* consolidate settlement growth in (1) existing large urban nodes, and (2) emerging and fast-growing urban nodes. • In addition to strengthening and consolidating expected population growth in range of urban regions, and existing cities and intermediary cities, proactively support the development and emergence of a number of new cities in identified densely populated and high potential transformation corridors.	***Strengthen Existing Urban Nodes, e.g.:*** • Mbombela, Richards Bay, Buffalo City and Mangaung in existing and identified growth corridors. ***Support Urban Nodes Under Stress, e.g.:*** • Kimberley and Rustenburg in economically declining regions ***Develop New/Emerging Urban Nodes, e.g.:*** • Support emergence of new cities Mthatha, Hazyview, Tzaneen and Lephalale.

Spatial Development and Investment Guidance

National Network of Regional Development Anchors (see **Figures 41** and **42**)

- Prioritise and strengthen strategically located regional development anchor towns in productive rural regions and priority national development, trade and transport corridors to provide (1) a range of services within the specific towns/cities and surrounding network of settlements and productive rural regions (see **Figures 40** and **41** and **Annexure B** for a list of towns and cities).
- Support and strengthen strategically located regional development anchors through (1) targeted settlement planning and development, (2) higher-order social infrastructure provision, and (3) focused support for small and medium-sized enterprise development, industrialisation and economic diversification.
- Use the investment and enhanced social service provision (see **Figure 42**) in regional development anchors to encourage officials working in these rural regions to stay in these settlements and contribute to the local economy, instead of commuting to larger towns or cities on a daily or weekly basis.
- Clearly identify the role of specific settlements as gateways and interchanges on the regional public transportation network, and incorporate these as such into the planning of functional rural regions.
- Strengthen the connectivity of traditional areas and rural settlements with (1) higher-order urban *settlements*, and (2) *economic systems* in functional rural regions, by making use of the road and rail network and regional corridor development.
- Plan social infrastructure provision within a regional-rural setting using the 'social services wheel', and use such investment to establish and create well-functioning, compact, lively, rural settlements and regional rural systems (see **Figure 42** and **Annexure B**).

National Spatial Development Priorities

Strengthen and Consolidate Existing Regional Development Anchor Towns, e.g.:

- Nodes on strategic routes, e.g. Harrismith, Estcourt and Clanwilliam; and
- Bigger nodes in denser regions, e.g. Phalaborwa, George and Mossel Bay.

Support Regional Development Anchors under stress, e.g.:

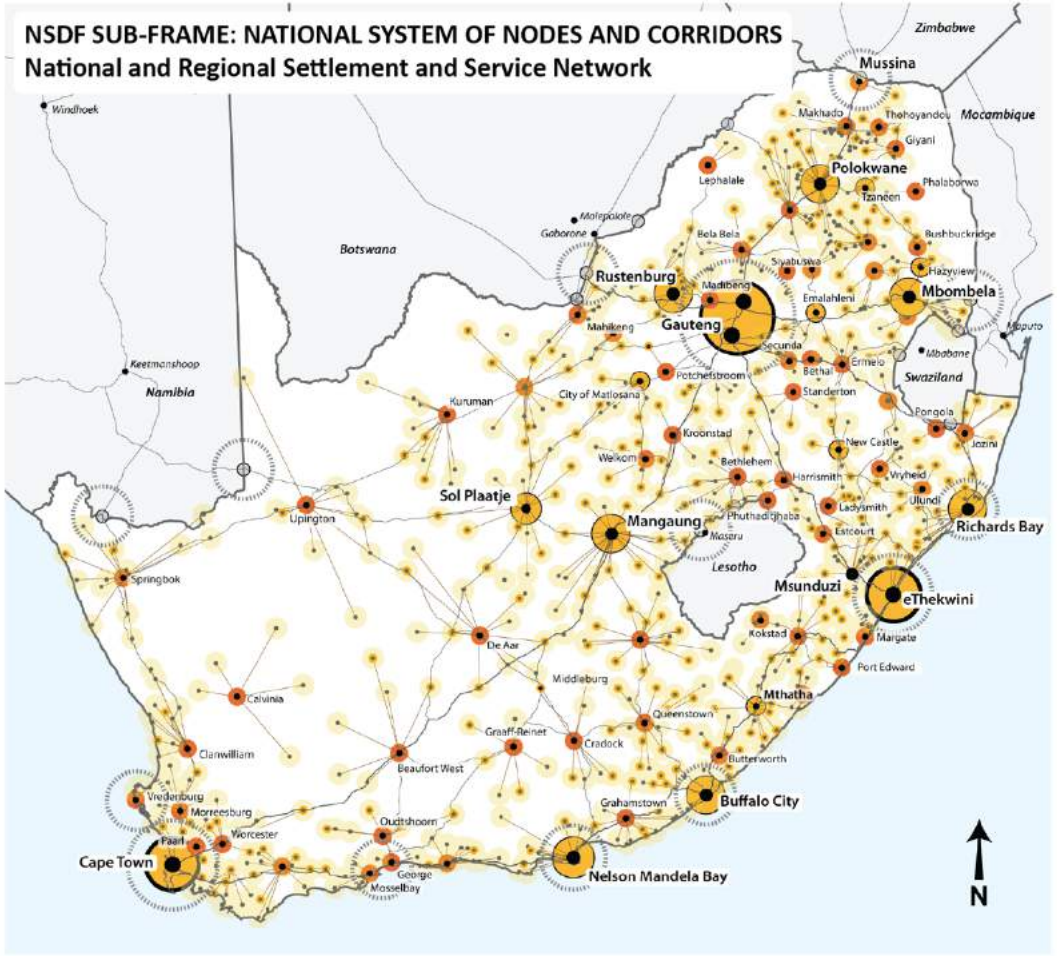
- In fast-growing towns with extended service delivery demands in densely-developed border regions, e.g. Musina, Pongola, Mmabatho, Mokopane, Tzaneen and Makhado;
- In nodes requiring consolidation and management support in arid, environmentally vulnerable regions, e.g. Upington and Kuruman;
- In nodes on strategic national routes, e.g. Beaufort West and Vryburg; and
- In smaller nodes in sparsely populated regions, e.g. Springbok and Calvinia that serve a large hinterland.

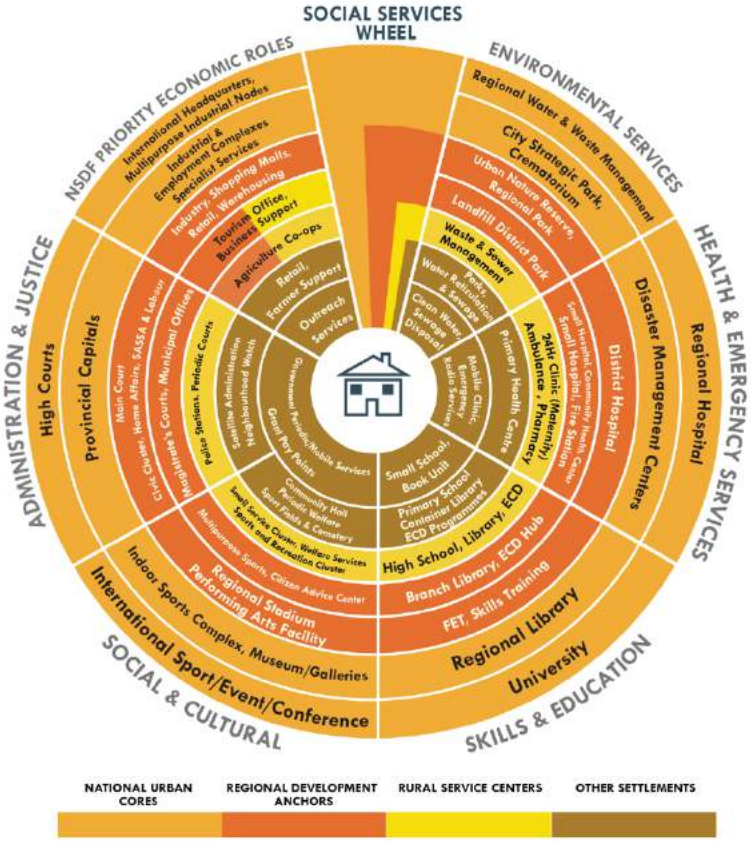
Create New/Transform towns into Regional Development Anchors e.g.:

- Towns in National Transformation Corridors, e.g. Giyani, Thohoyandou, Bushbuckridge, Mahikeng, Kuruman, Jozini, Ulundi, Kokstad and Butterworth.

Spatial Development and Investment Guidance	National Spatial Development Priorities
National Network of Rural Service Centres (see **Figure 41**) • Rural development must be supported though a hierarchical network of prioritised service centres (see **Figure 42** and **Annexure B**) where people in rural areas and settlements can optimally be provided with core municipal services, social and government services, and where rural logistics and support can be provided to optimally support rural development. • Towns that act as border and trade posts need special attention. • In arid areas and areas experiencing a decline in population, settlements must be consolidated and maintenance prioritised in such core towns. • In dense rural settlement regions, consolidation within nodal centres and rural design is required.	***Strengthen and Consolidate Existing Service Centres, e.g.:*** • Towns and border and trade posts such as Manguzi, Komatipoort, Ladybrand and Kamaqhekeza. ***Support Service Centres in Stressed Regions, e.g.:*** • Victoria West, Carnarvon, Groblershoop and Koffiefontein. ***Create New Service Centres and Transform Existing Settlements:*** • Settlements in dense rural settlement regions, e.g. Barkley East, Bizana, Dundee, Madibogo and Flagstaff.
Other Smaller Towns and Settlements in South Africa • Consolidate and provide basic services to the local population in a network of small towns and settlements (see **Annexure B** for a list of these towns). • Urban consolidation and basic service delivery in growing regions must keep pace with population growth and economic development. • In densely populated and growing rural regions, (1) settlement must be consolidates in nodes and (2) spatial planning and rural design done to ensure managed and quality future settlement development. • Specific support must be provided to (1) towns that act as border towns and trade posts, and (2) growing towns in border regions, • In areas that are ecologically-sensitive and that experience harsh climatic conditions, new settlement must be discouraged. • In arid areas and areas experiencing a decline in population, settlements must be consolidated and maintenance prioritised in the core towns. • Mining development must be decoupled from settlement development.	***Strengthen and Consolidate Existing Towns, e.g.:*** • Service Towns: Modjadjiskloof, Maclear, Marblehall and Paul Pietersburg; and • Trade posts and growing towns in border regions, e.g. Alldays, Clarens, Maluti and Rhodes. ***Support Towns in Stressed Regions, e.g.:*** • Areas experiencing a decline in population, e.g. Reivilo, Sannieshof, Pofadder. ***Develop New Towns and Transform Existing Dense Settlements:*** • In dense growing rural regions, e.g. Qumbu and Pomeroy.

Figure 42: NSDF Sub-Frame Two: National Systems of Nodes and Corridors: National and Regional Settlement and Service Network





5.3.3 National Urban Development Corridors and Growth Regions: Spatial Development and Investment Priorities

Spatial Development and Investment Guidance	National Spatial Development Priorities

Development within National Coastal Corridors (see **Figure 41**)
• The *Coastal Growth and Development Corridor* along the eastern and south coasts (N2) is supported as an area of strong interconnection between high-value rural resource production, ecological resource regions, popular tourist destinations, comfortable climatic zones and urban nodes.
• This corridor also provides opportunities for the consolidation of existing cities and the development of 'new' cities supported by well-developed multi-modal connectivity infrastructure. This requires that:
  ○ Port and airport development be strengthened in support of inter-regional trade flows and efficiency; and
  ○ Small harbour development in support of the fishing, tourism and maritime economy at identified coastal regional development anchor and rural service centres be maintained, expanded and accelerated.
	Strengthen and Consolidate Existing Corridors:
	• The KwaZulu-Natal Coastal Corridor (Port Shepstone to Richards Bay); and
	• The Garden Route (Mossel Bay to Nelson Mandela Bay).

Development within National Transformation Corridors (see **Figure 41**) • Consolidate settlement development and support the development of new cities in areas (1) of significant population growth, and (2) that are facing significant challenges and offer sizeable opportunities for transformation. • Develop regional and municipal resource management, urban-rural and eco-agri development strategies in strategic national water and agriculture production regions. • Accelerate small harbour development in support of the fishing, tourism and maritime economy in Regional Development Anchors and Rural Service Centres along the coast. • Undertake integrated human capital development, to enable a generation of young people to reap the benefits of urbanisation through (1) human capital development, and (2) the opening-up of urban economies to enable and support a multiplicity of livelihood options. • Use land administration and urban land reform to guide the interface between settlement planning, land-use, development and infrastructure planning in fast-growing formal and traditional settlement areas. • Introduce and upgrade sustainable built environment infrastructure as stimulus to enterprise development, with a focus on (1) housing, (2) basic service delivery, (3) public transport, and (4) rural-urban and rural-rural connections. • Introduce and/or strengthen effective regional collaboration, partnerships and cooperative governance models, to ensure (1) mutually beneficial natural resource-use and land development, and (2) optimise national, regional and local economic development benefits.	***Develop New Transformation Corridors:*** • *The Eastern Coastal Transformation Corridor:* Nelson Mandela Bay via Mthatha to Port Shepstone; • *The Eastern Escarpment Transformation Corridor:* Mbombela to Thohoyandou; and • *The North-Western Transformation Corridor:* Mahikeng via Vryburg and Taung to (1) Kuruman and Postmasburg and (2) Sol Plaatje.

Spatial Development and Investment Guidance	National Spatial Development Priorities
Develop alongside Inter-Regional and National Freight and Development Corridors (see **Figure 41**) • Consolidate nodal development to support inter-regional development corridors and trade with SADC, which includes (1) a focus on SADC corridors, and (2) improving cost and efficiency at border and port facilities on route, to handle greater international and regional trade flows. • Strengthen regional trade and flows on existing corridors, to support development of cities and towns on these corridors. • Prioritise infrastructure (ports, harbours and logistics infrastructure) and efficient operations of nationally-significant trade and movement networks.	***Existing National and Inter-regional Freight and Development Corridors to be Strengthened:*** • Significant export and import trade routes from Gauteng (1) via the N4 to Komatipoort, (2) via the N3 to eThekwini, and (3) via the N1 north to Musina.

5.3.4 National Action and Key Role-Players

Strategic investment in national urban growth regions will require (1) high levels of intergovernmental coordination and alignment, as well as (2) the introduction of *'joint national spatial accountability'* in terms of the achievement of national spatial development outcomes. Crucial actions that will have to be undertaken in these regards are the following:

- Urban areas experiencing large-scale urbanisation will need (1) the support of initiatives such as the IUDF and the DHS's long-term housing plans, *with a focus on* ensuring financial viability in human settlement development, and (2) regional-scale collaboration, *with a focus on* private sector, civil society and city government involvement;
- Coordination will need to be done between long-term infrastructure planning, implementation and maintenance, with a specific focus on (1) national water storage, allocation and availability, and (2) the national rail and road network, which necessitates harmonisation between IPAP, NATMAP 2050 and the NSDF;
- Capacity shortfalls in the construction, maintenance and upgrading of bulk water, energy and transport infrastructure at local level will require dedicated support from the national and provincial departments responsible for municipal and spatial planning, with care having to be taken to ensure that such support assists in the creation and maintenance of resilient and sustainable urban regions; and
- Urban land reform and the timeous release of suitable land in the right places must be done, which may require the provision of support to municipalities with (1) the identification, acquisition and release of such land, and (2) the use of such land in ensuring catalytic development, spatial transformation and inclusive growth.

5.4 NSDF Sub-Frame Three: National Resource Economy Regions

5.4.1 Spatial Development and Investment Guidance

Spatial development and investment directives and identified **national spatial development priorities** to develop the envisaged national resource economy regions (see **Figure 43**) are outlined below.

Rural regions and regional development anchors: The development of productive, functional rural regions throughout South Africa requires:

- The development of *viable, robust and resilient regional rural economies* that recognise and respect the limitations and interdependencies of the national ecological infrastructure and natural resources on which they depend;
- The (1) 'delineation' of functional rural regions, and (2) the identification of regional development anchors in such regions that are located on the *national transport network;*
- High levels of (1) *national-regional connectivity* between such regional development anchors, and urban nodes and regions, and (2) *regional-local connectivity* between such anchors and the towns and villages in their respective regions; and
- Sound spatial planning, consolidation of the urban development, and minimisation of the urban footprint, in such regions.

Diversity, strengths and cautions: While the concept of regional rural development is a generic one, the spaces in which it is to be utilised are far from that. When considering the diverse endowments and assets of these rural regions, it emerges that:

- The *eastern half* of the country has areas with moderate to high levels of '*agricultural potential*':
    - Although agriculture has been developed in many of the areas where this potential exists, there still remain areas of high-agricultural potential that have not yet been fully utilised; and
    - At the same time, there are also significant areas of dense human settlement on high-value agricultural land;
- The *western half* of the country has less agricultural potential, primarily due to far less annual rainfall in these areas than in the eastern half of the country:
    - Regions in this half of the country do, however, have a range of other opportunities, notably tourism, conservation and mineral-resource extraction;
- Both halves (east and west) hold most of the key national ground and surface-water production areas that are critical for water supply to the country's major urban regions, cities and towns, and, as such, this necessitate spatial planning, wise use of natural resources and effective land use management; and
- A number of key national conservation areas also feature prominently in the areas identified as productive rural regions, and although some communities already do benefit from these resources, much more can be gained from this relationship, notably in the area of eco-tourism and management of ecological infrastructure.

Sustainable resource use and land-use management: Intergovernmental cooperation and collaboration in (1) the development of productive rural regions, and (2) the management of natural resource use in such regions will be required. This is especially important in municipalities with significant parcels of high-value agricultural land that are under pressure from human settlement and/or mining. The focus of such collaboration,

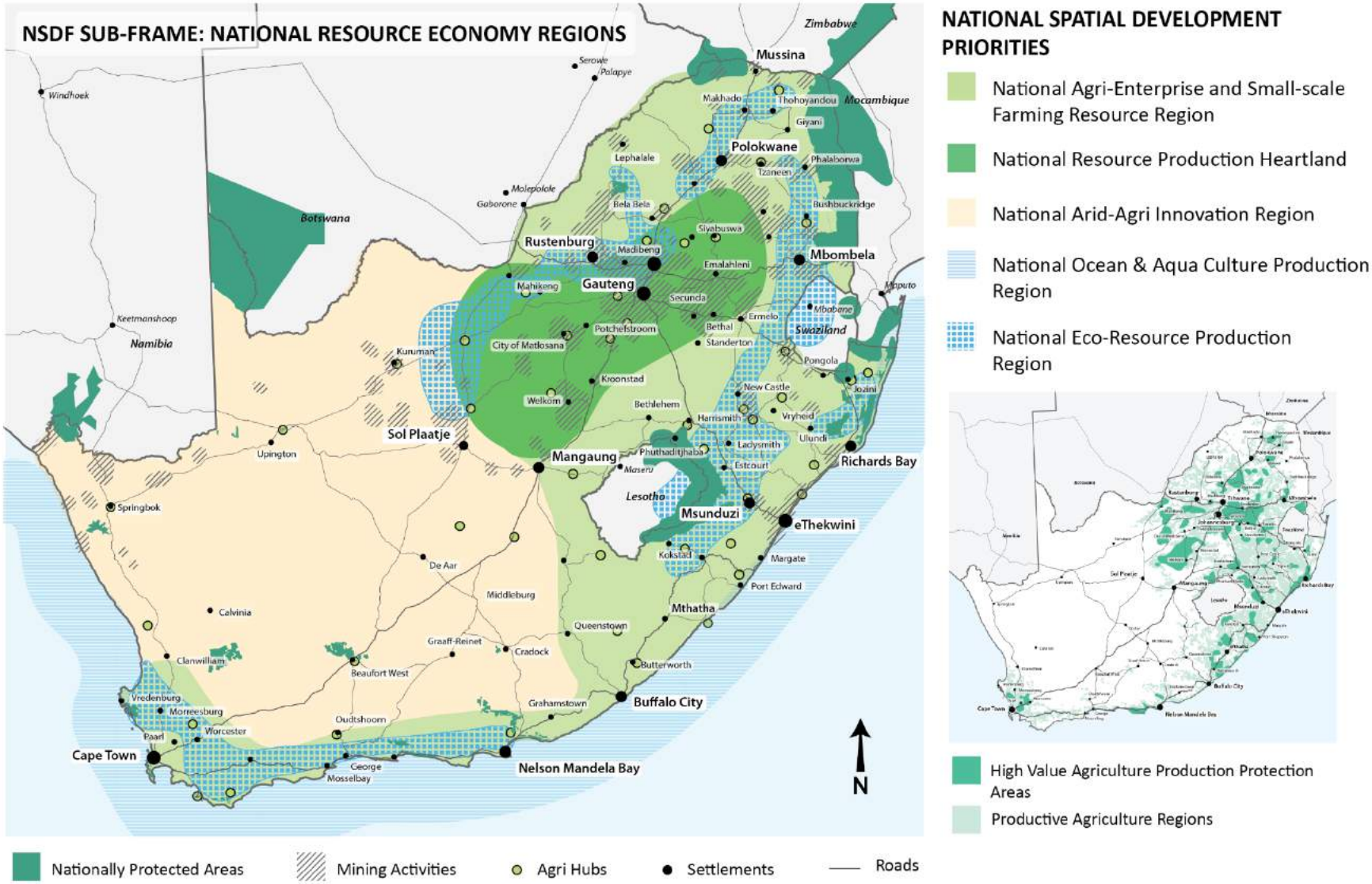
which should have a (1) spatial planning, (2) land use management and (3) inclusive growth component, must *at least* be on:

- *Water security, including* the mitigation of the impacts of regional rural development on national water resource availability and quality;
- *Food security,* including (1) the sustainable use of high-value agricultural land, and (2) the protection of national food production areas; and
- *Land reform,* including (1) the pursuit of justice in access to high-value agricultural land, and (2) the provision of support to new and emerging farmers in such areas.

Climate change adaptation: Climate change in the form of (1) less rain, (2) greater unpredictability in rainfall, (3) higher temperatures, (4) more very hot days, and (5) a greater risk of veld-fires, has far-reaching implications for agricultural produce and habitation in all of South Africa's productive rural regions. Even in regions where the impacts of climate change will be less severe, the more severe impacts in other regions will lead to increased pressure on the use of land and other natural resources in such 'less severely affected regions'.

In order to counter and mitigate the impacts of climate change, *innovative agricultural adaptation,* involving a move to (1) *agricultural commodities* that are more resistant to extreme and harsh conditions, and (2) *agricultural practices* that are better suited to the anticipated adverse climatic conditions, will be required. At the same time, climate change may open up opportunities for new economic activities in some regions, notably in the *area of solar energy generation*.

Figure 43: NSDF Sub-Frame Three: National Resource Economy Regions



5.4.2 National Resource Economy Regions: National Spatial Development and Investment Priorities

Spatial Development and Investment Guidance	National Spatial Development Priorities
Resource Production Heartland (see **Figure 43**) • Protection of high-value agricultural land through the use of 'rural edges' at the interfaces of regional rural regions with urban regions and nodes (see **Annexure B**) and the management of competing land uses. • Protection of high-value agricultural land, putting it to good use, and managing competition for development on such land, within the pursuit of (1) national food security, (2) economic growth, and (3) social stability. • Management of the development of land with high-agricultural production potential, and encouragement of small-scale agriculture and resource enterprise development.	***Strengthen the Existing Activities in Productive Rural Regions:*** • In the 'Central Heartland Region' located around the Gauteng, North-West, Mpumalanga and Limpopo Agriculture, Mining and Densely-Settled Urban Region. ***Support Stressed Rural Regions:*** • Intensive rehabilitation and strict control will be required in mining areas to limit water, air and soil pollution and land degradation; • The use of renewable and clean energy in coal mining regions will need to be incentivised; and • Regional Economic Innovation will need to be undertaken to mitigate the impact of declining demand and employment in mining areas in the areas around Gauteng and the Platinum Mining Belt. ***Create New and Transform Existing Productive Rural Regions:*** •Support and encourage urban agriculture and intensive agri-enterprise production in cities, towns and urban regions.
Agri-Enterprise Regions (see **Figure 43**) • Productive use of high value agricultural land to support national food security. • Rehabilitation of degraded land and effective land-use management. • Improvement of rural-to-rural connections, market accessibility and key agricultural-production infrastructure. • Enhancement of connectivity through well-planned infrastructure investment and settlement consolidation in well-connected regional development anchors.	***Strengthen Existing Productive Rural Regions:*** • Productive use of high-value agricultural land to support national food security. ***Create New and Transform Existing Productive Rural Regions:*** •Focus on the densely-settled Eastern and Northern Region in the Eastern Cape, KwaZulu-Natal and Limpopo Provinces; and • Improve rural-rural and urban-rural connectivity.

Spatial Development and Investment Guidance

Arid Agri-Region (see **Figure 43**)

- This arid area has extensive agricultural activities, with (1) pockets and stretches of intensive irrigation-farming, (2) mining clusters, (3) renewable energy farms/plants, and (4) small, compact settlements.
- The impact of climate change in the already drier and hotter western parts of the country (where large areas of locally-significant agricultural activities from an (1) economic activity and (2) job-provision perspective are located) will require regional agricultural adaptation-support and effective land use management.
- Innovative farming techniques and technologies must be introduced and supported in selected arid and semi-arid areas of the country, by making wise and smart use of groundwater and/or water transfers.
- Regional development initiatives to share capacity, research and innovation in support of innovative regional development must be encouraged.

National Spatial Development Priorities

Support Stressed Rural Regions:

- A good example of this is the *Nama-Karoo Regional SDF Initiative* and the intensive multi-stakeholder engagement and collaboration around it.

Strengthen Existing Productive Rural Regions

- Strengthen, use and expand on existing irrigation schemes, innovative farming practices and tourism activities.

Create New and Transform:

- 'Irrigation innovation areas' that make wise use of existing and new dams, irrigation schemes and canals must be designed and introduced as a matter of urgency.

Spatial Development and Investment Guidance

Eco-Resource Production and Livelihood Regions (see **Figure 43** and **Annexure B**)

- Enhance (1) the productive capacity, (2) environmental and livelihood quality, (3) cultural heritage, and (4) natural resource-access of these regions through effective agrarian practices and enterprise development programmes that are focussed on natural resource restoration and custodianship.
- Discourage further land and settlement development, and carefully manage existing settlements and land uses in productive agricultural regions that play a crucial role in national strategic water production, national food security and rural livelihoods.
- Pursue effective management and custodianship of national strategic water source production regions.
- Ensure efficient rural-to-rural connectivity in rural regions, to enhance the prospects of making a life in these areas.
- Rehabilitate degraded land and ensure effective land use management, settlement consolidation, improved rural connectivity and an eco-resource related enterprise focus, to (1) provide opportunities for livelihoods and industry development, and (2) support national water availability.
- Enhance and further expand the value and contribution of the Oceans' and Aqua Economy Areas to (1) local livelihoods and regional, and (2) national economic development.

National Spatial Development Priorities

Support Stressed Rural Regions:

- The Southwestern Region (i.e. the Western Cape) where changing climatic conditions will (1) significantly impact on national food production and (2) require regional agricultural adaptation and effective land use management;
- The Central (Gauteng and Limpopo) Regions where nationally significant water and food production are impacted by human settlement and mining activities, and require effective land-use management;
- The Northern KwaZulu-Natal Region (the Umkhanyakude DM), with nationally and regionally significant protected areas; and
- The Eastern Drakensberg Region including the Natal Midlands and extending into Mpumalanga along the Eastern Escarpment.

Create New and Transform:

- The densely-settled Eastern and Northern Regions (Eastern Cape, KwaZulu-Natal and Limpopo);
- The arid region on the western border of the Northwest Province extending into the Northern Cape; and
- The eastern border of the central high-productive value agricultural land and Central Heartland Region.

Spatial Development and Investment Guidance

Mining and Energy Production Areas and Supportive Infrastructure

- Collaborative, long-term regional development in *new mining exploration areas* is required, which includes (1) scenario development, (2) population migration projections, (3) diversification strategies, (4) cost/benefit-modelling of regional infrastructure provision, municipal service delivery, and the cumulative impacts of the mining activities, and (5) the optimisation of regional and local development opportunities.
- Rehabilitation and negative impact mitigation must extend beyond agreements on paper and be enforced on the ground.
- In the case of *new mines,* where (1) the levels of automation and mechanisation are low, and (2) sizeable numbers of workers will still be required, housing provision and/or settlement expansion must take place in *regional development anchors or existing small towns where adequate social services are available*. In deciding on the licencing of such new mining operations, (1) national and regional development priorities, and (2) the cumulative impacts of the envisaged mining activities and further such activities on the creation of functional rural regions must be considered. Where possible, mining companies should become far more involved in the development of functional, resilient rural regions, which may include investments in (1) hard, transport and connectivity, and (2) soft, social services-infrastructure.
- Limit development of new mining-dependent towns.
- Support and diversify economies in declining mining towns and regions.

National Spatial Development Priorities

Existing Productive Rural Regions to be Strengthened:

- Long-term infrastructure planning must be informed by changes in the mining industry;
- Regional development and resource management must be used to support further mining and associated activities in the northern mining regions; and
- In national urban regions, enterprise opportunities, large-scale innovations in service delivery and disruptive technologies need to be researched and explored, to support urban economies and national well-being.

Support in Stressed Rural Regions:

- The Mpumalanga Coal Mining and Coal Fired Power Plant Region will come under increased pressure as a result of (1) environmental concerns, (2) a possible decline in the demand for coal, and (3) large-scale employment losses, which requires regional-scale and industry-orientated innovation and the introduction of measures to reduce emissions; and
- Within remote and arid regions in the western and north-western parts of the country, the cumulative impact of a growing number of wind farms, solar plants and mining and energy-related projects should be carefully evaluated in regional context. The growth of existing towns close to these areas is supported, but new and on-site settlement far away from existing towns is not.

5.4.3 National Action and Key Role-Players

The strategic development of productive rural regions and regional development anchors, and the consolidation of regional settlement patterns, will require (1) high levels of intergovernmental coordination and alignment, as well as (2) the introduction of 'joint accountability' in terms of the achievement of clearly-defined regional spatial development outcomes. Crucial actions that will have to be undertaken in these regards are the following:

- Ensuring *broad-based support for the regional-rural development approach,* and *sustained, active collaboration* by national and provincial sector departments, traditional leaders, municipalities, the private sector and communities in (1) undertaking the necessary regional-rural planning and related long-term infrastructure investment, (2) tying-in key settlement development plans and initiatives, such as the IUDF, the DHS's long-term housing plans, and municipal IDPs and SDFs to these regional-rural plans, (3) implementing the plans in a coordinated and integrated manner, (4) monitoring the implementation of the plans, and (5) building the necessary capacity to undertake such regional rural planning and development; and
- Supporting national food security through the *protection and productive use of high-value agriculture land,* as identified and directed by DAFF, and ensuring that all relevant national and provincial sector departments and municipalities account for their use and management of high-value agricultural land; and
- Pursuing and assisting with initiatives aimed at regional economic diversification and transition in *mining-dependent areas,* which may involve (1) scenario development, (2) research, (3) piloting of proposals, and (4) the provision of enterprise development and support, and entail the involvement of a wide range of role-players, including the mining industry, organised labour, municipalities, traditional leaders, SALGA, universities and research councils.

5.5 NSDF Sub-Frame Four: National Movement and Connectivity Infrastructure System

5.5.1 Spatial Development and Investment Guidance

Spatial development and investment directives and identified **national spatial development priorities** to develop the envisaged national connecting and movement infrastructure (see **Figure 44**) are outlined below.

Long-term planning and investment: Given the high costs and long life-cycles involved in large scale infrastructure investment, timeous planning, evaluation and design of appropriate geo-specific national economic infrastructure is critical. Transitions in (1) national settlement patterns, (2) major economic activities and sectors, (3) climate change, and (4) technological advances, notably in transport, energy generation and communication networks need to be planned for well in advance, and modes and patterns of infrastructure investment adjusted accordingly. These actions require (1) the *phasing* of new connections and extensions, and the maintenance of existing infrastructure, and (2) the initiation of *collaborative long-term planning* with regards to national and inter-regional land and sea-based connecting and enabling infrastructure.

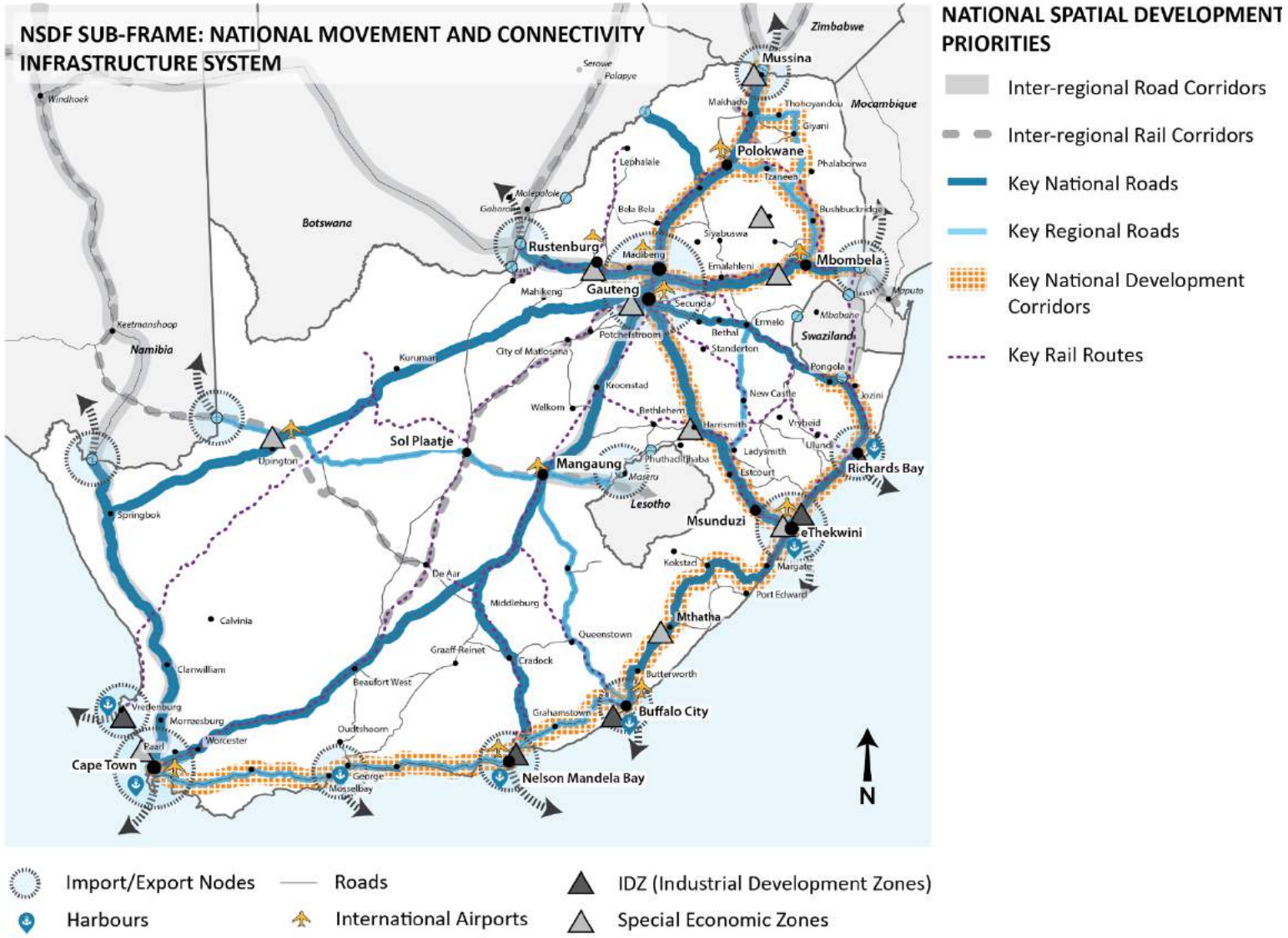
Movement and connection infrastructure networks: These networks are fundamental to (1) national spatial development, (2) the utilisation of national economic opportunities, (3) the creation of a national system of national urban cores, smaller settlements and national spatial development corridors, and (4) international, continental and SADC trade and connectivity. The effective functioning of these networks requires that:

- *Investment in rail* is prioritised over road for economic, ecological and efficiency reasons;
- *Rail infrastructure* is rehabilitated and expanded to support national freight movement and trade with SADC;
- All the roads in the core national network are appropriately surfaced and the key routes prioritised for *regular maintenance;*
- *Logistics hubs, ports (airports and harbours) and border posts are maintained and expanded,* as and where necessary, to keep pace with national economic growth and reduce delays at ports; and
- *ICT networks* are extended to the whole country with national corridors, urban regions, cities, regional development anchors, and rural service centres being prioritised, and the rest of the country incrementally covered over time.

Energy-transmission networks: Maintenance of the national electricity grid infrastructure is crucial and timeous expansion of the network must be done as and where required from *a national development perspective*. Where new sources of energy are to be introduced to the national energy mix, the following should be observed:

- *Solar and wind:* Production is to be located in close proximity to the national grid or users, and in distributed networks in low-density areas/small remote towns where it should be delivered though small-scale distributed networks;
- *Nuclear:* Nuclear power stations must be located in close proximity to large water bodies (for cooling) and the existing national distribution network; and
- *Gas:* Gas pipelines must be spatially located in such a way that they do not encumber, but support national economic development.

Figure 44: NSDF Sub-Frame Four: National Movement and Connectivity Infrastructure System



5.5.2 National Movement and Connectivity Infrastructure System: National Spatial Development and Investment Priorities

Spatial Development and Investment Guidance	National Spatial Development Priorities
Inter-Regional and National Development Corridors (Road and Rail) (see **Figure 44**) • Adequately plan for and enable trade with SADC, which includes (1) a focus on SADC corridors, and (2) improving cost and efficiency at border and port facilities to handle greater international and regional trade flows. • Ensure that all the roads in the core national network are appropriately surfaced and the key routes prioritised for regular maintenance. • Logistics hubs, ports (airports and harbours) and border posts are maintained and expanded, as and where necessary, to keep pace with national economic growth and reduce delays at ports.	***Maintain and Strengthen Existing National Development Corridors:*** • The N4-Maputo Corridor between Gauteng and Maputo; • The N4-west, leading to the Trans Kalahari-corridor, and passing through Botswana and Namibia to the port of Walvis Bay; • The National routes in South Africa from Gauteng to the Durban port (N3); • The N1 north from Gauteng to Musina and the Beitbridge border into Zimbabwe; • The N1 south from Gauteng to Cape Town; and • The N2 Coastal Corridor. ***Support Development in Stressed Regions;*** •The N2 from Nelson-Mandela Bay, via Mthatha to Port Shepstone; and • The N2 from Richards Bay to Pongola. ***Create New;*** • From Mbombela to Makhado and Polokwane.
Inter-Regional and National Freight Corridors (Road and Rail) (see **Figure 44**) • Investment in rail is prioritised over road for economic, ecological and efficiency reasons. • Rail infrastructure is rehabilitated and expanded to support national freight movement and trade with SADC.	***Maintain and Strengthen Existing National Development Corridors:*** • Existing national and inter-regional freight and development corridors along significant export and import trade routes, from Gauteng (1) via the N4 to Komatipoort, (2) via the N3 to eThekwini, and (3) via the N1 north to Musina.

Spatial Development and Investment Guidance	National Spatial Development Priorities
Access Roads to Service Towns and Hinterland (Rural to Rural) (see **Figure 44**) • Improve rural-urban and rural-rural connections to support rural development, innovation and enterprise development though infrastructure investment, access to services, rural logistics, market gateways and economic agglomeration.	***Existing Connections to be Strengthened and Maintained:*** • Maintain existing connectivity between urban regions, cities, new cities, regional development anchors, and resource production areas in the sparsely populated west, and the well-connected southern and central parts of the country; and • Maintain access roads and strategic infrastructure to ensure resilience of regional development anchors and rural service centres in areas where increased temperature and increased flooding, due to climate change, are predicted to impact negatively on infrastructure networks. ***Create New and Transform:*** • Improve rural-rural connectivity in National Transformation Corridors, and specifically so in the National Eco-Production Regions in the eastern and northern parts of the country.

5.5.3 National Action and Key Role-Players

The maintenance, expansion and upgrading of the country's national transport and communications network will require coordination and collaboration by a variety of role-players, notably the NDoT, the DMR, the DoE, the DWS, the NPC, the PICC, ESKOM, SANRAL, PRASA, provincial sector departments responsible for long term infrastructure planning and development, municipalities, mining companies, organised labour and community representatives. The huge costs involved in such maintenance, expansion and upgrading, and the many other pressing development needs may lead to it being neglected. Ways in which timeous planning, budgeting and investment can be secured are as follows:

- Preparing a *long-term national infrastructure plan* that is aligned with the NSDF, (1) using the appropriate scenario development modelling techniques, (2) with involvement of a wide range of role-players and interest groups, including communities, and (3) introducing a phased approach to spread the cost of time;
- Creating a broad-based awareness of national and supra-national interdependencies and the need for investing in the network;
- Building the necessary capacities amongst the key role-players;
- Introducing a coordinating and monitoring institution, and providing regular updates as to the state of the network; and
- Using the NSDF's envisaged 'national spatial accountability system' to monitor the contribution of key role-players in the maintenance, expansion and upgrading of the network in accordance with the national plan.

5.6 NSDF Sub-Frame Five: National Ecological Infrastructure and Natural Resource System

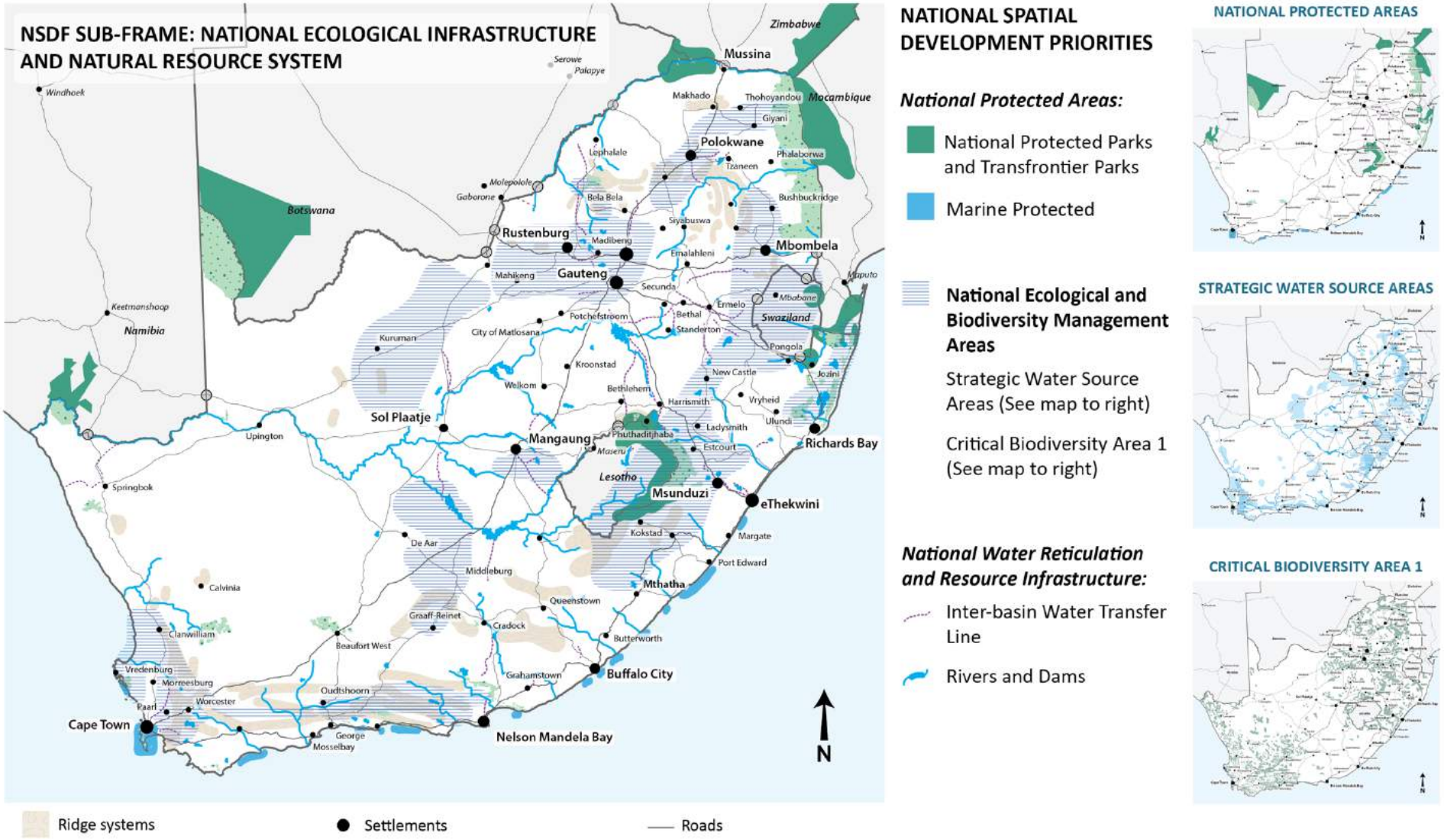
5.6.1 Spatial Development and Investment Guidance

Spatial development and investment directives and identified **national spatial development priorities** to develop the envisaged national ecological infrastructure and natural resource system (see **Figure 45**) are outlined below.

Protecting the national ecological infrastructure and natural resource system: This 'system' provides a natural resource foundation that enables all human life and activities in the country, and must, as such, be wisely used, managed and protected. It includes areas regarded as strategic assets within the country's national and international biodiversity, ecology and tourism areas (including Ramsar Sites and Transfrontier Parks). The protection of this system requires that:

- National spatial development is well-planned and well-managed to (1) limit negative impacts on the ecological infrastructure system, (2) ensure that urban growth and land use fits within national and regional water resource availability profiles, and (3) ensure that land and/or settlement development does not threaten or compromise strategic surface and groundwater water production areas (see **Annexure B**);
- National water use is curbed through effective water demand management, recycling, infrastructure maintenance and water augmentation projects; and
- The strategic national water resource infrastructure system is well-maintained and the restoration of degraded water areas is prioritised.

Figure 45: NSDF Sub-Frame Five: National Ecological Infrastructure and Natural Resource System



5.6.2 National Ecological Infrastructure and Natural Resource System: National Spatial Development and Investment Priorities

Spatial Development and Investment Guidance:	National Spatial Development Priorities
National Protected Areas (see **Figure 45**) • Protect national ecological resources and national heritage areas. • National spatial development is well-planned and well-managed to enable protection, as well as the effective use and beneficiation of national protected areas in accordance with the relevant regulations.	***Maintain and Strengthen the Full Range of Priority Protected Areas:*** • Transfrontier Parks; • Major National and Provincial Parks; • National Fresh Water Protection Areas; and • Marine Protected Areas. ***Support Development in Stressed Regions:*** • The N2 from Nelson-Mandela Bay via Mthatha to Port Shepstone; and • The N2 from Richards Bay to Pongola. ***Create New and Transform:*** • The ecologically-sensitive area from Mbombela to Makhado and Polokwane.

Spatial Development and Investment Guidance:

National Ecological and Biodiversity Management Areas *(see **Figure 45**)*

- Critical Biodiversity Areas (CBAs) and Strategic Water Source Areas (SWSAs) have been identified as Priority National Ecological Infrastructure Regions that are of national importance and development.
- Management, productive use and restoration of these areas (1) is a joint responsibility, and (2) could also be used for the socio-economic benefit of people, cities and economies in the regions in which they are located.
- Land-uses that reduce run-off or stream flow, or affect water-quality (e.g. mining, plantations, crop production and overgrazing) should be avoided in SWSAs, wetlands should be kept in good condition or rehabilitated, and invasive alien plants should be cleared. To support this:
  - The natural resource foundation and bio-diversity must be conserved in these areas of national and international significance; and
  - CBAs should remain in natural or near-natural ecological condition, i.e. no intensive land uses should take place in these areas (see **Annexure B**).
- 'Developmental co-benefits' must be created through effective management and use of strategic ecological and biodiversity management areas, to support rural livelihoods, especially with regards to custodianship and tourism opportunities.

National Spatial Development Priorities

Maintain and Strengthen the Full Range of Priority Protected Areas:

- Manage and protect national protected areas; and
- Manage the use and restoration of relevant water-bodies and water production areas.

Support Stressed Areas:

- Effective land development management and productive development of CBAs and SWSAs in Eco-Urban Resource Production and Livelihood Regions (i.e. densely-settled smallholder farming and livelihood regions);
- Strategic Ground and Surface Water Production Areas have been identified, but must still be formally delineated and proclaimed;
- SWSAs need to be effectively restored, used and managed to support enterprise and livelihood opportunities and eco-industrial activities; and
- Existing and new economic activities must adhere to national development and management guidelines that have been (and are being) developed.

Create New and Transform:

- Effective land-use management and productive development of CBAs and SWSAs in dense clusters of urban, agricultural, industrial and mining areas in the Central Heartland area; and
- Effective management of SWSAs in Agri-Arid Regions (i.e. Groundwater Production Areas)

National Water Reticulation and Resource Infrastructure (see **Figure 45**)

- Maintenance, extension and upgrading of the strategic water resource infrastructure network (including dams, reservoirs and transfer pipelines) is prioritised to support nationally significant spatial development areas (see **Annexure B**).
- Water pipelines must be maintained and extended to key urban cores, anchor towns and geo-specific production sites in line with national priorities.

Maintain and Strengthen the Full Range of Priority Protected Areas:

- Urban regions;
- Urban nodes;
- Regional Development Anchors; and
- Rural Service Centres.

Support Stressed Areas:

- Maintenance of water-transfer infrastructure that supports crucial national urban concentrations, nodes and development corridors; and
- Management of settlement growth in areas that are arid and increasingly under pressure in terms of water-availability, which may even include restrictions on further growth should water-availability not improve.

5.6.3 National Action and Key Role-Players

Regulatory implementation with regards to *SWSAs is* imperative. While *guidelines for the management of development in such areas* have been prepared, further actions have to be taken to see them implemented, i.e. (1) an intergovernmental team led by DEA and SANBI has to be put together, (2) awareness of the guidelines must be raised, and (3) the guidelines must be finalised and promulgated. In the interim, awareness of these guidelines *can and needs to be raised,* specifically with regards to:

- Activities such as (1) agriculture, (2) mining, (3) land and settlement development, (4) infrastructure investment, and (5) spatial planning and land use management in areas experiencing significant development pressures, such as the three National Transformation Corridors; and
- Category 1 of the CBAs, and the implications of this 'CBA-status' for land development and land use management in such areas.

With regards to '*national spatial accountability*' for the protection of environmental quality in (1) SWSAs, (2) CBAs: Category 1, and (3) National Fresh Water Protection Areas, provinces responsible for the management of these areas, and their upstream impacts, will have to account for their actions. In addition to this, provincial and municipal SDFs must ensure that development in such key ecological areas is (1) *not to their detriment*, and (2) *enhances* their ability to provide their crucial life-enabling and ecological support services. The *capacity, monitoring and support-implications* of these roles and duties are significant, and will need to be jointly attended to by the national sector departments responsible for environmental affairs and spatial planning.

5.7 National Spatial Action Areas

5.7.1 Introduction

Following on from the *directive in the NDP,* the NSDF identifies areas of *significant national risk and potential*. In sharp contrast to the *centrifugal forces (i.e. 'outward-pushing forces away from the core')* that shaped Apartheid national spatial development planning, the NSDF provides a development perspective aimed at '*drawing all South Africans closer to the core*':

- *Nationally,* in the form of a shared and smaller, yet more viable, more sustainable and more resilient national spatial footprint that places less pressure on our core national natural resource areas and ecological systems, and is more affordable to service and sustain;
- *Regionally,* in functionally integrated areas focused on regional development and wellbeing that (1) are supported by regional development collaboration agreements between of State and non-State actors, and (2) provide an interface between 'the national and 'the local; and
- *Locally,* in high-quality, serviced, compact, diverse and connected places with viable, robust and resilient economies.

In order to create such a '*shared, smaller, better connected and more sustainable South Africa',* the NSDF identifies the most urgent short-term, strategic spatial development catalysts to (1) bring about radical spatial transformation at scale, (2) manage and mitigate rising national risks, and (3) move our country at speed towards the **Ideal National Spatial Development Pattern** (see **Figure 46)**. These are called **National Spatial Action Areas (NSAAs) (see Figure 47)**

Concerted, focused and sustained intergovernmental collaboration is required in these **NSAAs** (see **Table 1**) in the short term to:

- Target national spatial development *actions and interventions;* and
- Kickstart the process of aligning plans, budgets and departmental plans in and between spheres of government around *national spatial development priorities.*

The selection of the *five types* of **NSAAs** was informed by:

- The challenges and trends that are most likely to impact our country over the course of the (1) immediate, and (2) medium and longer-term futures;
- The stated development objectives in national and provincial development and sector plans; and
- The gap between our national spatial development vision and the status quo.

The identification of the **NSAAs** does not propose an overhaul or detailed spatial alignment of every existing planning instrument or initiative. Instead the introduction of these *priority areas* seeks to impact government processes by:

- Identifying (1) urgently required interventions in national space and (2) priority spatial development enablers for accelerated development impact in this space; and
- Restoring and managing the sustainable utilization of our country's rich natural resource foundation and ecological infrastructure.

In the following sections, the **NSAAs** are briefly outlined, a few key statistics for each of the provided, and key action areas and role-players identified. (The statistics were generated by use of the **national Mesozone data set**[xvi], with the exception of the population growth scenarios for 2030 and 2050, for which the Green Book[xvii] was used.)

Table 1:An Overview of the Actions required in the National Spatial Action Areas in accordance with four of the NSDF Sub-Frames

National Spatial Action Areas	Relevant NSDF Sub-Frames			
	National System of Nodes and Corridors	National Resource Economy Regions	National Movement and Connectivity Infrastructure System	National Ecological Infrastructure and Natural Resource System
National Transformation Corridors	• Consolidating development in fully-fledged and transformed national urban nodes • Supporting and strengthening regional development anchors to play their crucial (1) national connecting, and (2) regional development anchoring and enhancing roles	• Supporting and strengthening and emerging farmers and small and medium-scale agriculture • Supporting eco-production and eco-entrepreneurs • Ensuring sustainable food production for national food security	• Creating new connections, e.g. the N2-extension, and strengthening existing connections	• Managing land development and land uses to ensure the protection of critical national water resources • Supporting agricultural practices and human settlement patterns and forms that optimise the use of land, and limit the impact on the ecology and the associated ecological service systems
Central Innovation Belt	• Diversifying the economy and supporting its transition to the secondary and tertiary sectors • Creating transformed, well-functioning settlements	• Supporting agro-processing, viable mineral and metals beneficiation and alternative energy production	• Strengthening existing connections to, and links with the core areas of the Gauteng Urban Region	• Managing and mediating the impacts of (1) dense human settlement and (2) intense economic activity on critical national water resources, e.g. the pollution-mitigation actions in the case of the Vaal River
National Resource Risk Areas	• Ensuring the sustainable use of resources, and preventing pollution and resource depletion	• Managing competing and incompatible land uses, e.g. mining, agriculture and eco-tourism	• Strengthening infrastructure networks to facilitate regional, national and cross-border flows	• Prioritising resource management by, amongst others, introducing far more stringent and binding protection of strategic (1) water resource and ecological systems services areas, and (2) high-value agricultural land
National Urban Regions	• Strengthening the network and nodes on it to become national centres of economic and human resource development and innovation	• Managing national and cross-border interdependencies for national and wider SADC benefit	• Refurbishing and developing infrastructure to enable and support (1) economic diversification and expansion, and (2) more youthful and larger populations • Strengthening regional, national and cross-border linkages	• Managing national and regional cross-border interdependencies to the benefit of all concerned • Managing the impact of human settlement and economic activities on strategic water resource areas
Arid-Innovation Region	• Strengthening regional development anchors as connecting, catalytic and interface points	• Supporting intensive, high-value productive agriculture • Strengthening and expanding alternative energy generation	• Supporting connections between urban cores and regional development anchors	• Ensuring sustainable aquaculture activities that assist with ensuring regional and national food security • Managing land development and economic activities, to ensure the protection of critical natural resources

Figure 46: From Ideal National Spatial Development Pattern to National Spatial Action Areas

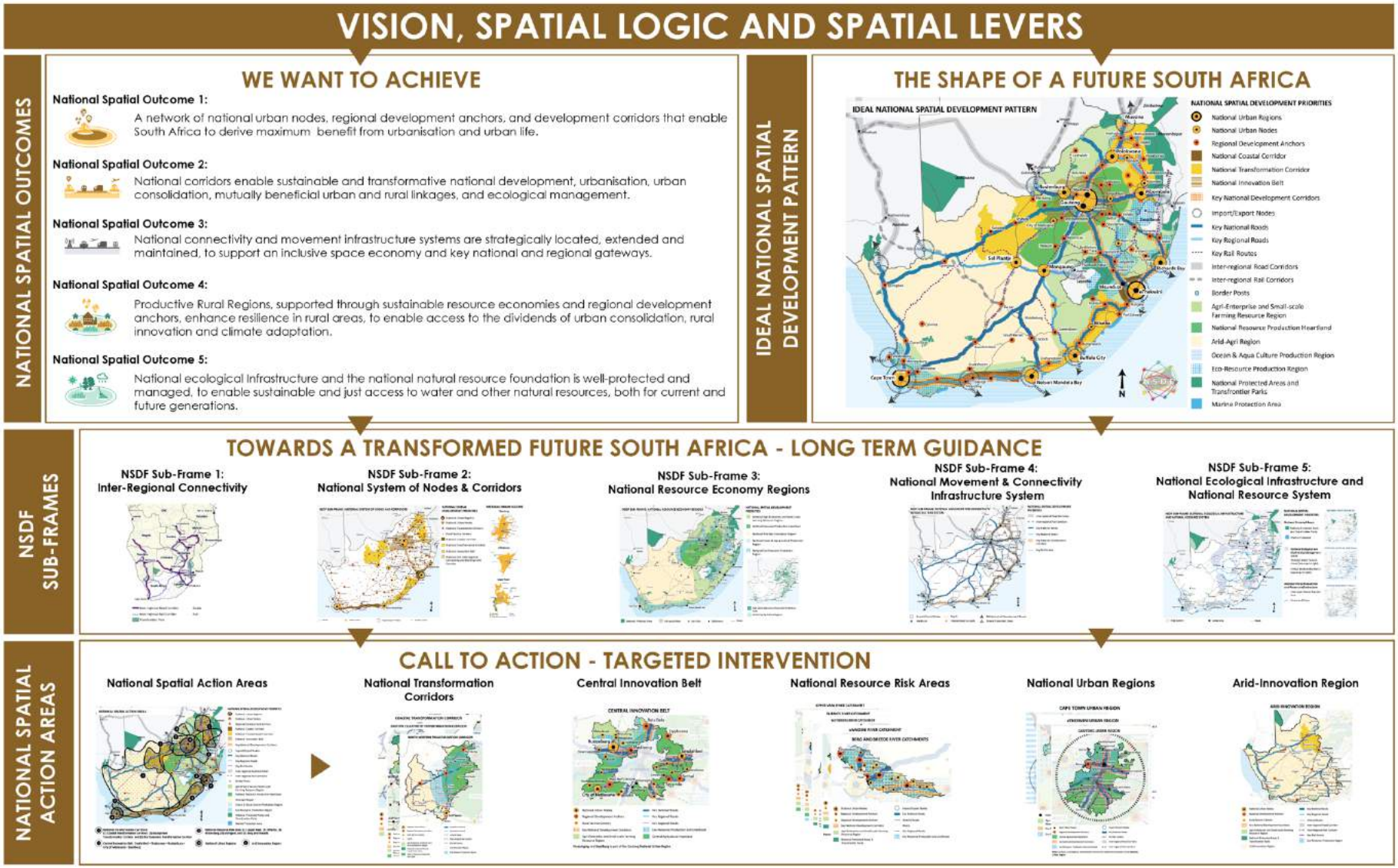
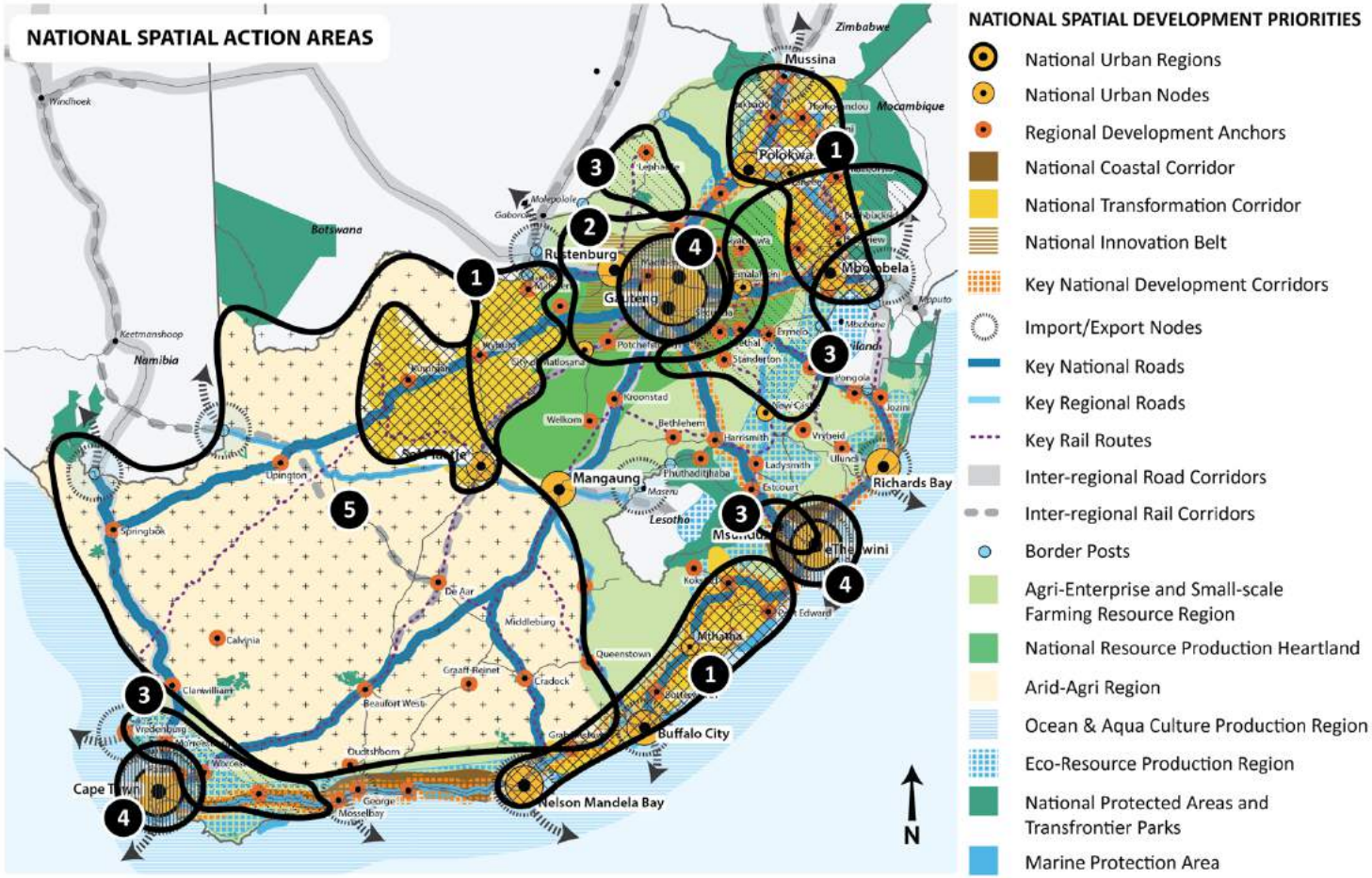


Figure 47: National Spatial Action Areas



1 National Transformation Corridors: (1) Coastal Transformation Corridor; (2) Escarpment Transformation Corridor; and (3) Northwestern Transformation Corridor

2 Central Innovation Belt: Emalahleni – Siyabuswa – Rustenburg – City of Matlosana - Sasolburg

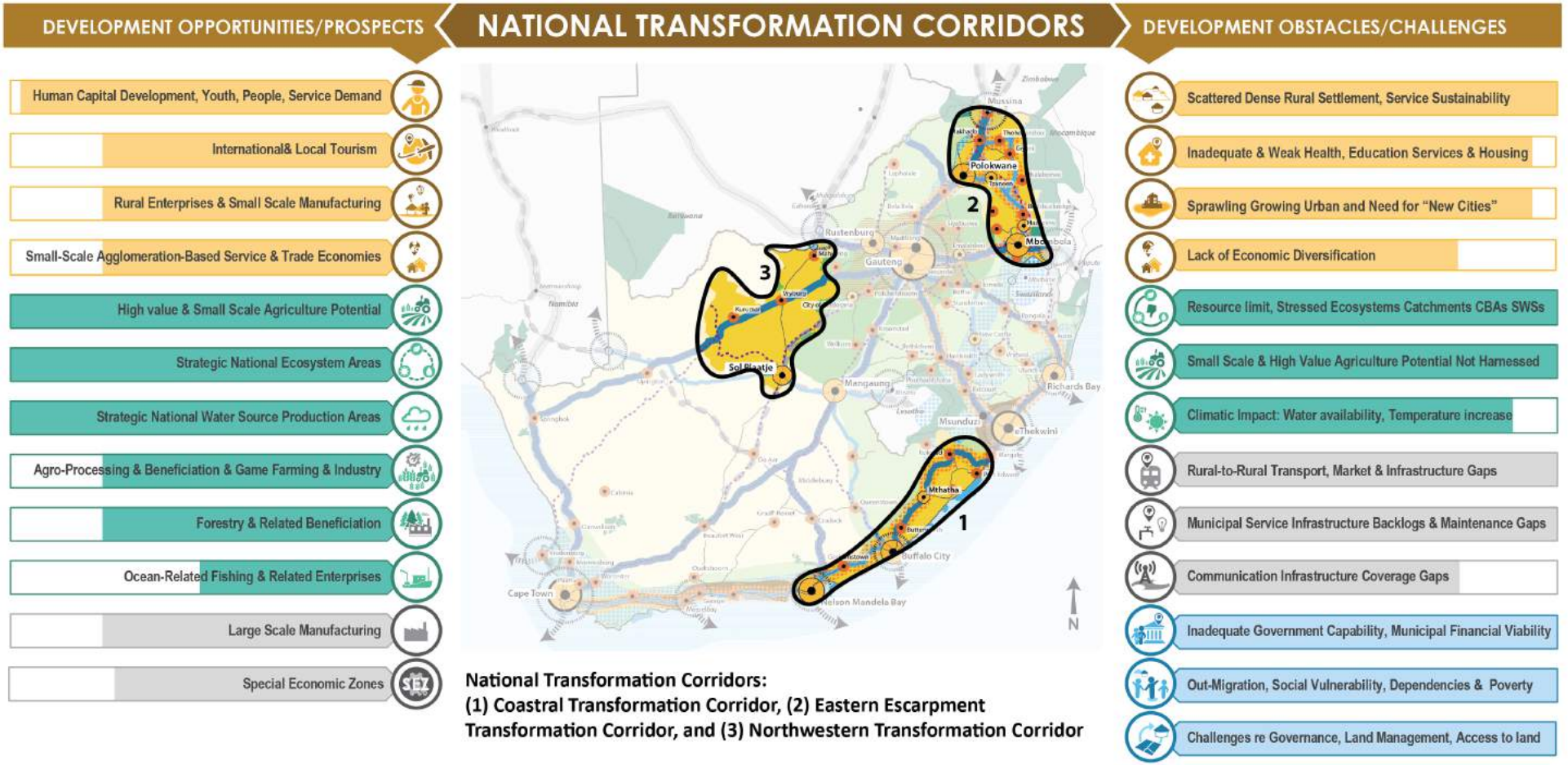
3 National Resource Risk Area: (1) Upper Vaal, (2) Olifants, (3) Waterberg, (4) uMngeni, and (5) Berg and Breede

4 National Urban Regions

5 Arid Innovation Region

5.7.2 NSAA One: National Transformation Corridors

Figure 48: National Transformation Corridors Overview



National Transformation Corridors:
(1) Coastral Transformation Corridor, (2) Eastern Escarpment Transformation Corridor, and (3) Northwestern Transformation Corridor

5.7.2.1 Significance of the National Transformation Corridors as NSAAs

While these three corridors have their own unique contexts and challenges, they share many similarities: They all have (1) large, youthful populations, (2) shared histories of deep deprivation and neglect as former Apartheid Bantustans, (3) high levels of poverty and unemployment, and (4) dense and sprawling rural settlement forms. They are also areas of high ecological value to the country as (1) surface water producers in the case of the *National Coastal Transformation Corridor* and the *Eastern Escarpment Transformation Corridor,* and (2) an enormous source of groundwater, in the case of the *Northwestern Transformation Corridor*. In addition to this, the *National Coastal Transformation Corridor* and the *Eastern Escarpment Transformation Corridor* include large portions of the country's very limited high-value agricultural land, and as such are key to the long-term food security of the country. The *Northwestern Transformation Corridor*, in turn, includes crucial cattle and irrigation farming activities.

In terms of climate change predictions, the *National Coastal Transformation Corridor* and the *Eastern Escarpment Transformation Corridor,* will also be called upon to provide (1) water and food, (2) key ecosystems services, and (3) a place to call home, due to the relatively more favourable climatic conditions in these parts of the country vis-à-vis far less favourable conditions envisaged in the western, north-western and central parts of the country. In the case of the *Northwestern Transformation Corridor,* the area in which it is located is set to experiences very harsh climatic conditions in the not-too-distant future, but (1) due to intensive irrigation, farming has become established as a regionally and nationally important economic activity, and (2) mining has a become a earner of foreign exchange for the country.

Given their shared histories, similar challenges, and importance for the future of the country, declaring these areas as **NSAAs** is crucial, (1) for the sake of historical redress, (2) for attending to pressing rural spatial, social and economic development challenges at scale, (3) for national food and water security, and (4) for realising our desired future **Ideal National Spatial Development Pattern**. Failure to turn the tide on the challenges these NSAAs face, and ensuring sustainable (1) service delivery, and (2) regional economic development, would not only be to the detriment of these areas and the people who live in them, but also the country as a whole, due to significant regional interdependencies.

5.7.2.2 Focus of Actions and Interventions

Guided by **the Ideal National Spatial Development Patterns** and the **NSDF Sub-Frames**, the following national priorities require strategic spatial action to (1) bring about transformation in the national spatial pattern, (2) enable national and regional-scale climate and developmental adaptation, and (3) achieve developmental impact at scale:

- Extend and improve the transportation networks, ensure *regular maintenance* and *upgrading* of existing infrastructure, notably roads, increase investment in high-speed ICT infrastructure and enhance urban-rural and rural-rural connectivity;
- Develop a *network* of (1) strong and vibrant existing and emerging cities and large towns to fulfil the role of fully-fledged national urban nodes, (2) viable regional development anchors, and (3) well-capacitated rural service centres;
- Ensure effective city and town management to prevent sprawl, ensure innovative settlement planning and urban land reform, well-managed land-use, enabling infrastructure investment.
- Introduce rural design, urban/rural edges, land administration and urban land reform, to consolidate place-specific urbanisation in

dense rural settlements within a strategically located network of rural service centres and towns

- Provide catalytic, innovative and contextually-suitable sustainable infrastructure, social and basic services to support enterprise development, well-being and inclusive growth with both an ecological and human-focussed approach.
- Prioritise human capital and people-centred enterprise development, e.g. arts and culture, tourism, knowledge creation, education and innovation;
- Optimise the agricultural opportunities in the region and support the establishment of small-scale farming activities, agri-enterprises and agri-led industrialisation, to foster productive rural regions, enhance national food security, and strengthen national water security;
- Develop the tourism sector and creative industries in the region, with an emphasis on small-and-medium-sized farming activities, and agri-eco production;
- Ensure the protection and management of ecological infrastructure and national resources and protected areas, including SWSAs and high-value agricultural land; and
- *Establish strong regional growth and development compacts,* including all role-players, i.e. the three spheres of government, traditional leaders, communities (notably youth), the private sector, CBOs, NGOs and organised labour, and ensure regional, cross-provincial and cross-municipal boundary collaborative spatial development planning and governance.

In the following figures (**Figures 49 to 51**) and tables (**Tables 2 to 7**), (1) a spatial image of each of the three National Transformation Corridors, (2) a summary of the key statistics regarding each of the corridors, (3) the names of the affected municipalities in each of the corridors, and (4) the names of the key settlements in each of the corridors is provided.

Figure 49: The Coastal Transformation Corridor Close-Up

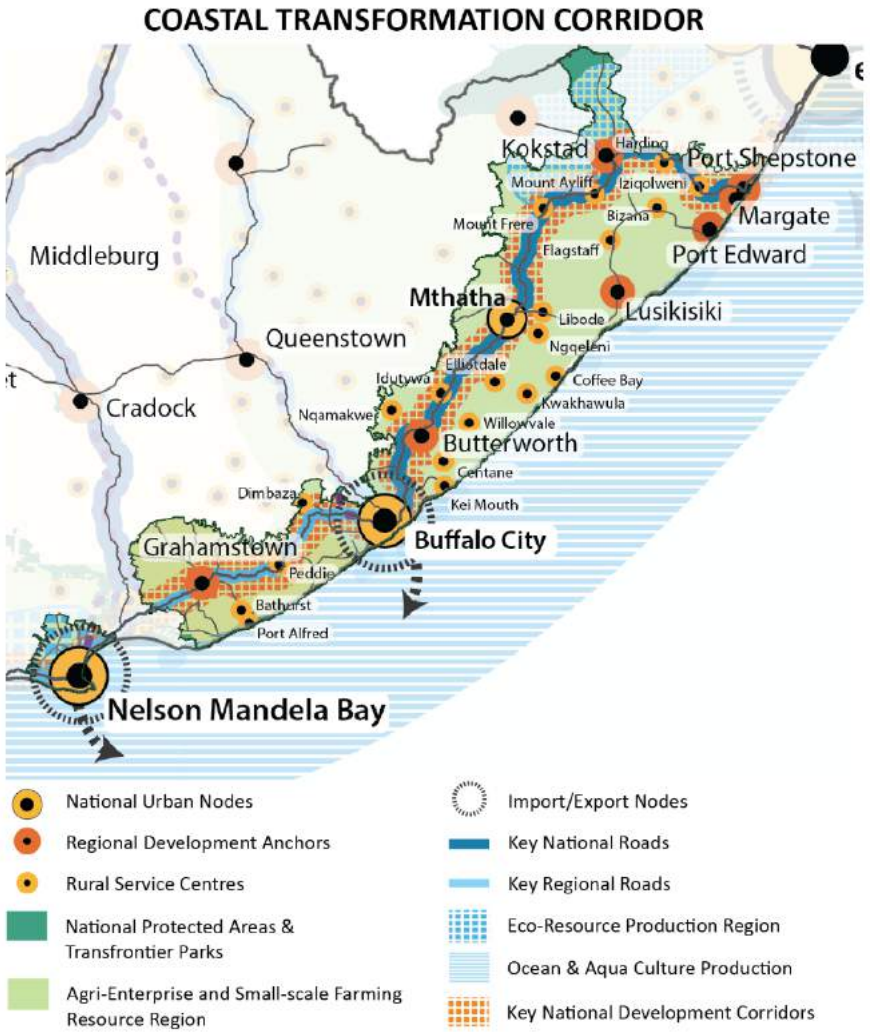


Table 2: Coastal Transformation Corridor population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	5 144 905	9.2%
Youth (under 35)	3 381 782	9.4%
Population 2030 (medium growth)	6 300 850	9.7%
Population 2050 (medium growth)	7 273 761	9.7%
Total GVA 2016 (R mil)	174 770.12	6.5%
Unemployed 2016	495 284	8.7%
Poor Households 2011	296 524	10.0%
Productive land: +/- 42 000 km^2 = 6.5% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Cores:** Nelson Mandela Bay, Buffalo City and Mthatha as new emerging city;
- **Regional Development Anchors:** Grahamstown, Butterworth, Lusikisiki, Kokstad, Port Shepstone-Margate; and
- **Rural Service Centres:** Port Alfred, Bathurst, Peddie, Kei Mouth, Centane, Willowvale, Nqamakwe, Idutywa, Kwakhawula, Elliotdale, Ngqeleni, Port St Johns, Libode, Flagstaff, Bizana, Mount Frere, Iziqolweni, Mount Ayliff and Harding.

Table 3:Coastal Transformation Corridor affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
EC	Mbizana	Alfred Nzo
EC	Ntabankulu	Alfred Nzo
EC	Umzimvubu	Alfred Nzo
EC	Great Kei	Amathole
EC	Mbhashe	Amathole
EC	Mnquma	Amathole
EC	Ngqushwa	Amathole
EC	N/A	Buffalo City
EC	Makana	Cacadu
EC	Ndlambe	Cacadu
EC	N/A	Nelson Mandela Bay
EC	King Sabata Dalindyebo	OR Tambo
EC	Mhlontlo	OR Tambo
EC	Ngquza Hill	OR Tambo
EC	Nyandeni	OR Tambo
EC	Port St Johns	OR Tambo
KZN	Greater Kokstad	Sisonke
KZN	Ray Nkonyeni	Ugu
KZN	uMuziwabantu	Ugu

Figure 50: The Eastern Escarpment Transformation Corridor Close-Up

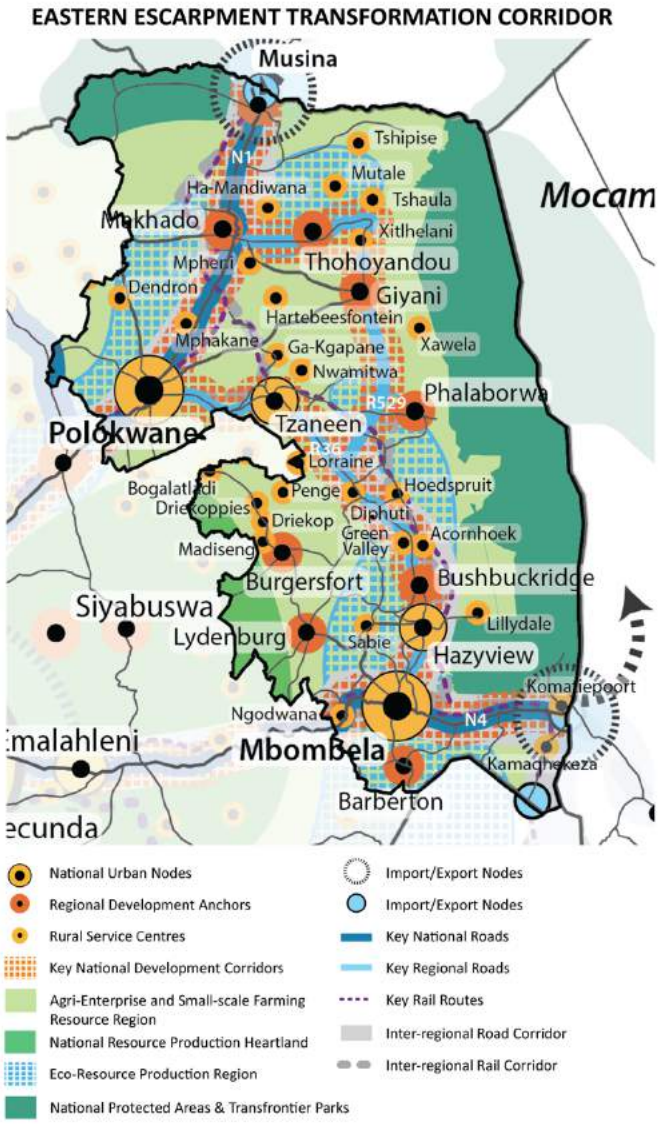


Table 4: Eastern Escarpment Transformation Corridor population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	5 693 132	10.2%
Youth (under 35)	3 897 376	10.8%
Population 2030 (medium growth)	6 514 770	10.0%
Population 2050 (medium growth)	7 036 132	9.4%
Total GVA 2016 (R mil)	177 240.17	6.6%
Unemployed 2016	592 768	10.4%
Poor Households 2011	316 163	10.7%
Productive land: +/- 50 000 km² = 7.7% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Cores:** Mombela, Polokwane, Hazyview and Tzaneen;
- **Regional Development Anchors:** Barberton, Burgersfort, Bushbuckridge, Giyani, Lydenburg, Makhado, Musina, Phalaborwa and Thohoyandou; and
- **Rural Service Centres:** Acornhoek, Bogalatladi, Dendron, Diphuti, Ga-Kgapane, Ha-Mandiwana, Hartebeesfontein, Hoedspruit, Kamaqhekeza, Komatiepoort, Lillydale, Lorraine, Madiseng, Mphakane, Mpheni, Mutale, Ngodwana, Nwamitwa, Penge, Sabie, Tshaulu, Tshipise, Xawela and Xitlhelani.

Table 5: Eastern Escarpment Transformation Zone affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
LIM	Molemole	Capricorn
LIM	Polokwane	Capricorn
LIM	Greater Giyani	Mopani (part of)

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
LIM	Greater Letaba	Mopani
LIM	Greater Tzaneen	Mopani
LIM	Ba-Phalaborwa	Mopani (part of)
LIM	Maruleng	Mopani
LIM	Greater Tubatse/Fetakgomo	Sekhukhune
LIM	Musina	Vhembe (part of)
LIM	Thulamela	Vhembe
LIM	Makhado	Vhembe
LIM	Collins Chabane	Vhembe (part of)
MP	Thaba Chweu	Ehlanzeni
MP	Nkomazi	Ehlanzeni (part of)
MP	Bushbuckridge	Ehlanzeni (part of)
MP	Mbombela	Ehlanzeni (part of)

Figure 51: Northwestern Transformation Corridor Close-Up

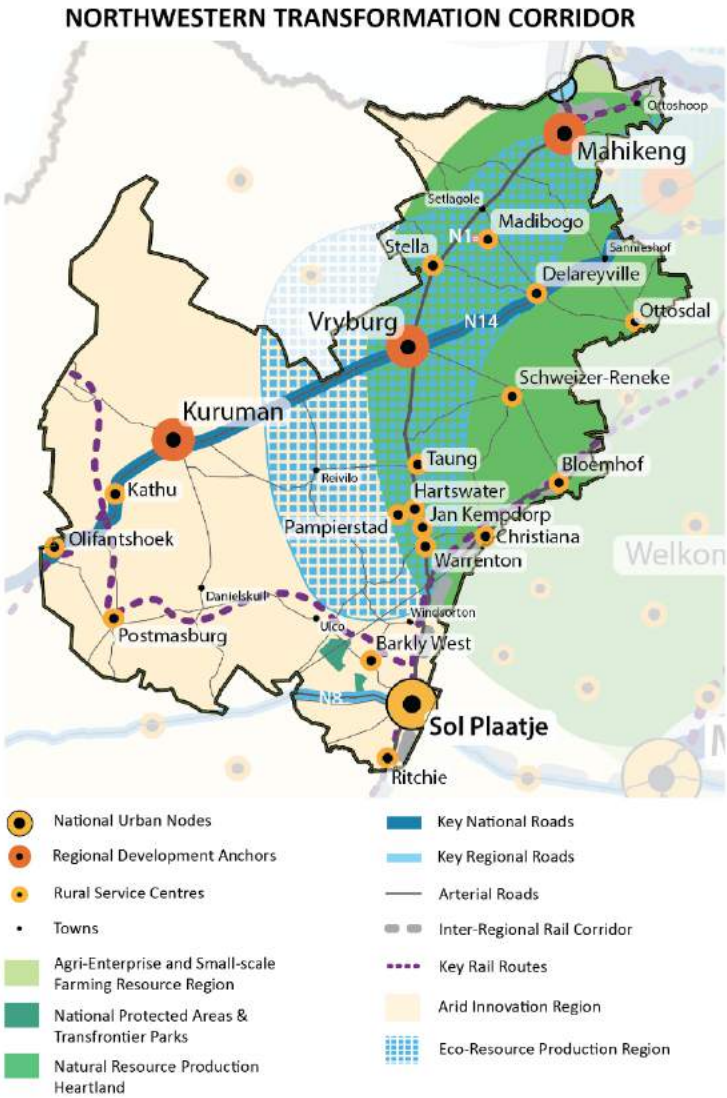


Table 6: Northwestern Transformation Corridor population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	1 612 544	2.89%
Youth (under 35)	1 057 572	2.94%
Population 2030 (medium growth)	1 833 925	2.81%
Population 2050 (medium growth)	1 961 518	2.61%
Total GVA 2016 (R mil)	61 684.23	2.30%
Unemployed 2016	153 847	2.69%
Poor Households 2011	87 300	2.94%
Productive land: +/- 58 100km^2 = 8.9% of national productive land		

National System of Nodes and Corridors Elements:

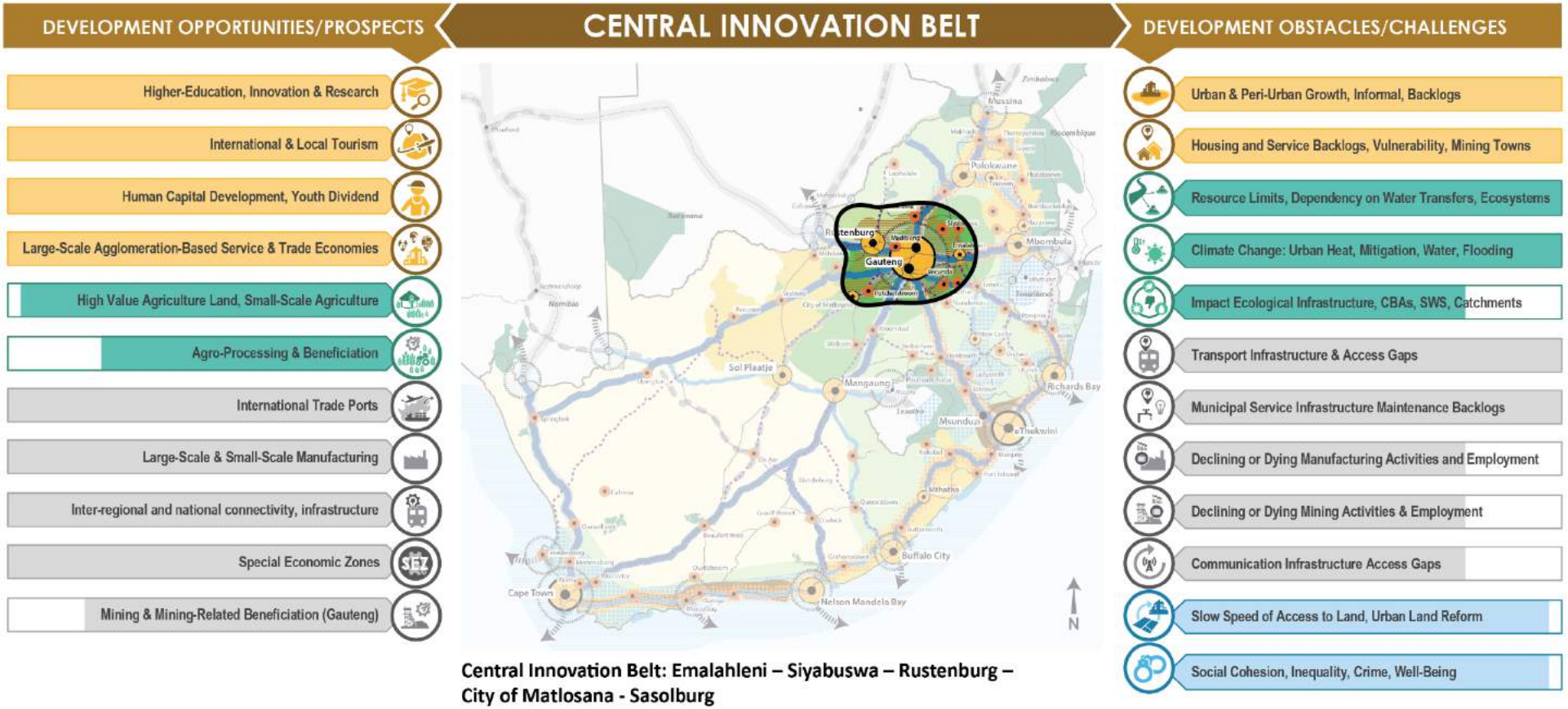
- **Urban Core:** Sol Plaatje;
- **Regional Development Anchors:** Kuruman, Mahikeng and Vryburg; and
- **Rural Service Centers:** Barkly West, Bloemhof, Christiana, Delareyville, Hartswater, Jan Kempdorp, Kathu, Madibogo, Ottosdal, Pampierstad, Postmasburg, Ritchie, Schweizer-Reneke, Stella, Taung, Warrenton and Olifantshoek.

Table 7: Northwestern Transformation Zone affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
NC	Dikgatlong	Frances Baard
NC	Magareng	Frances Baard
NC	Phokwane	Frances Baard
NC	Sol Plaatje	Frances Baard
NC	Gamagara	John Taolo Gaetsewe
NC	Ga-Segonyana	John Taolo Gaetsewe
NC	Joe Morolong	John Taolo Gaetsewe (part of)
NC	Kgatelopele	Z F Mgcawu
NC	Tsantsabane	Z F Mgcawu (part of)
NW	Greater Taung	Dr Ruth Segomotsi Mompati
NW	Lekwa-Teemane	Dr Ruth Segomotsi Mompati
NW	Mamusa	Dr Ruth Segomotsi Mompati
NW	Naledi	Dr Ruth Segomotsi Mompati
NW	Mafikeng	Ngaka Modiri Molema
NW	Ratlou	Ngaka Modiri Molema
NW	Tswaing	Ngaka Modiri Molema

5.7.3 NSAA Two: Central Innovation Belt

Figure 52: Central Innovation Belt Overview



Central Innovation Belt: Emalahleni – Siyabuswa – Rustenburg – City of Matlosana - Sasolburg

5.7.3.1 Significance of the Central Innovation Belt as NSAA

The area around the core of the Gauteng urban region is spatially positioned to be an economically strong, diverse production area that forms an integral part of the core economic driver of the country and sub-continent. The Central Innovation Belt is a key contributor to national economic growth and employment and a crucial surface water production area, i.e. the Vaal Catchment.

The Central Innovation Belt is characterised by:

- A long history of high-value mining and industrial production that is, and has been, experiencing significant shrinkage and job losses in some parts, with more very likely to come, which is primarily due to changes in the demand for resource-based commodities and the costs of resource extraction;
- Intensive agriculture and related agro-enterprises, as well as tourism activities that are not necessarily at odds, but also not enhanced by the mining and industrial activities in the same area;
- Sustained strong natural population growth and in-migration, much of it driven by the prospect of employment in the mining and industrial sectors;
- High levels of regional economic and socio-economic vulnerability, due to the economic decline and job losses and uncertainties about the future of especially mining in the area; and
- Pressures on natural resources, notably productive agricultural land and surface water production by population growth, urban sprawl and pollution.

The eastern part of the Region intersects with another NSAA, i.e. the Olifants River Catchment in Mpumalanga, which is a National Resource Risk area in Mpumalanga, where similar changes in the mining and energy-generation sectors, as well as competition for land and water for food production require a transition in the regional economy and mitigation of environmental risk factors. The Vaal Catchment area covers the southern portion of the Region, where severe challenges around contamination have been, and are being experienced.

5.7.3.2 Focus of Actions and Interventions

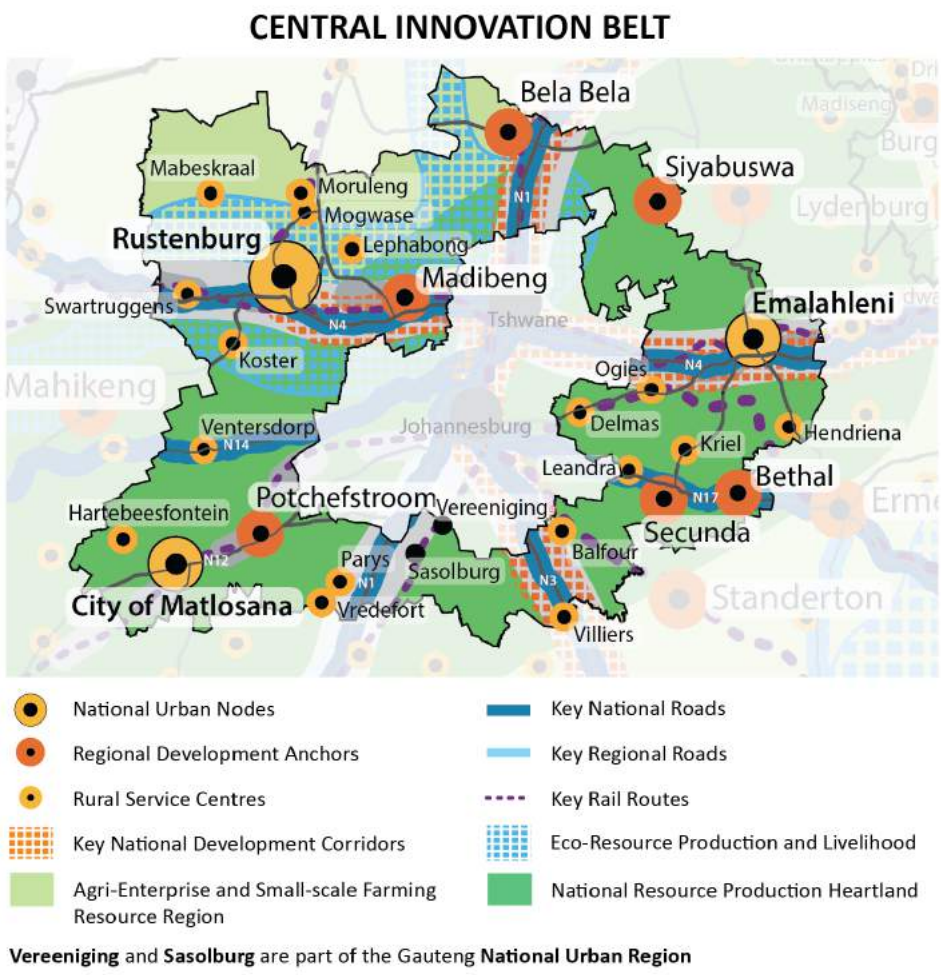
Guided by **the Ideal National Spatial Development Patterns** and the **NSDF Sub-Frames**, the following proposals are made:

- Support large-scale regional economic and employment change in the region through innovation, diversification, adaptation and the repurposing of existing industrial land and associated infrastructure;
- Expedite urban and rural land reform, consolidate existing small-and-medium-scale agriculture support programmes, protect and optimise high-value agricultural land, and strengthen the focus on job-intensive agro-processing in the area;
- Introduce a special collaborative programme in government (including DMR, DTI, CoGTA, DRDLR, DPME, NT, provincial sector department and municipalities) with a specific focus on ensuring (1) innovation and economic diversification, and (2) quality human settlement development in the region, and involve universities, research councils, the private sector, communities and organised labour in this urgent initiative; and
- Establish a joint public-private action group to manage the threat to nationally and regionally important water and productive land resources, with the priority being on the impact of formal and informal urban sprawl, acid mine water, the maintenance of productive agriculture, especially for small scale farmers close to urban centres, and the rehabilitation and management of the Vaal system.

In the following figure (**Figure 53**) and tables (**Tables 8** to **9**), (1) a spatial image of the Central Innovation Belt region, (2) a summary of key

statistics regarding region, (3) the names of the affected municipalities in the region, and (4) the names of the key settlements in the region are provided.

Figure 53: Central Innovation Belt Close-Up



Vereeniging and **Sasolburg** are part of the Gauteng **National Urban Region**

Table 8: Central Innovation Belt population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	4 630 286	8.3%
Youth (under 35)	2 909 184	8.1%
Population 2030 (medium growth)	5 746 604	8.8%
Population 2050 (medium growth)	6 904 972	9.2%
Total GVA 2016 (R Mil)	283 504	10.6%
Unemployed 2016	538 925	9.4%
Poor Households 2011	270 064	9.1%
Productive land: +/- 50 000 km^2 = 7.7% of national productive land		

National System of Nodes and Corridors Elements:

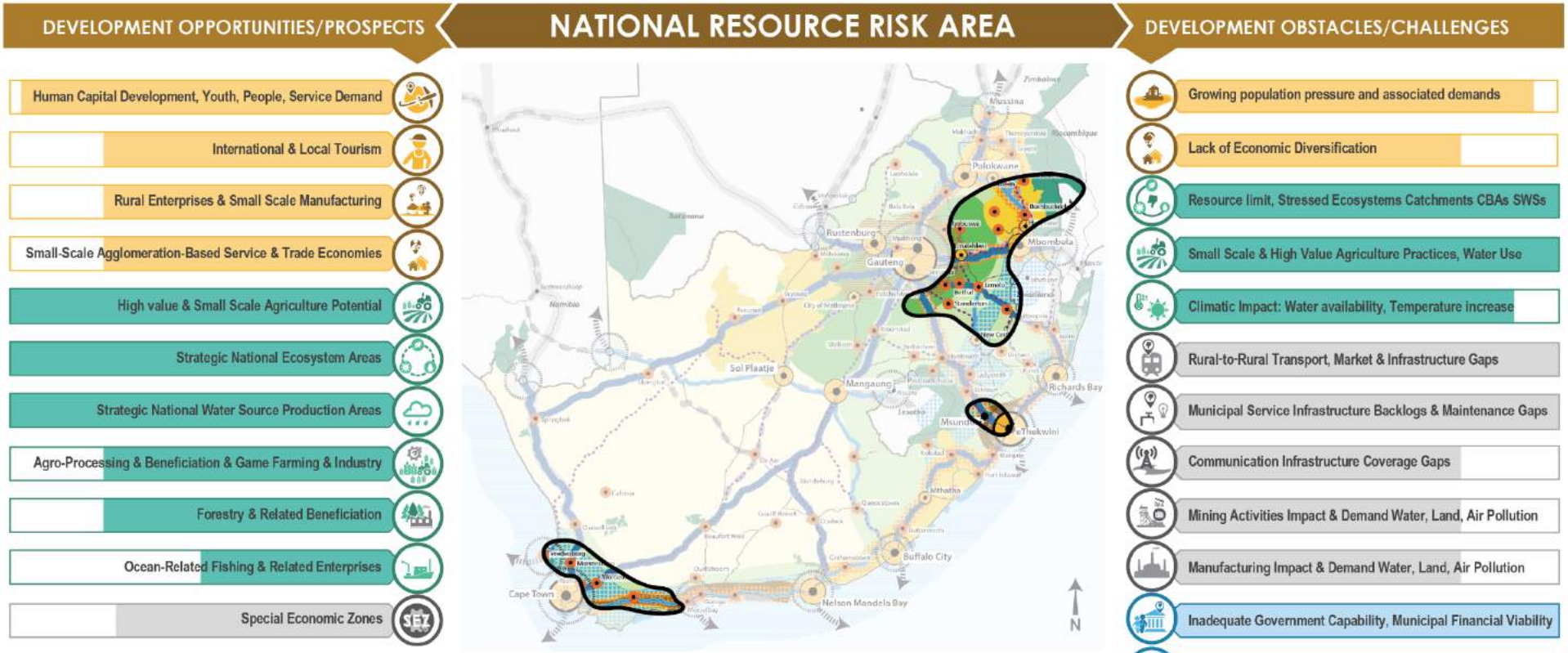
- **Urban Cores:** City of Matlosana, Rustenburg and Emalahleni;
- **Regional Development Anchors:** Bela Bela, Bethal, Brits (Madibeng), Potchefstroom, Secunda, Siyabuswa-Dennilton; and
- **Rural Service Centres:** Balfour, Delmas, Hartebeesfontein, Hendrina, Koster, Kriel, Leandra, Mabeskraal, Moruleng, Ogies, Parys, Swartruggens, Ventersdorp, Villiers and Vredefort.

Table 9: Central Innovation Belt affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
FS	Metsimaholo	Fezile Dabi
FS	Ngwathe	Fezile Dabi (part of)
FS	Moqhaka	Fezile Dabi (part of)
FS	Mafube	Fezile Dabi (part of)
GT	Emfuleni	Sedibeng (part of)
GT	Midvaal	Sedibeng (part of)
LIM	Bela-Bela	Waterberg
MP	Govan Mbeki	Gert Sibande
MP	Dipaleseng	Gert Sibande
MP	Emalahleni	Nkangala
MP	Steve Tshwete	Nkangala
MP	Victor Khanye	Nkangala
MP	Dr JS Moroka	Nkangala
MP	Thembisile	Nkangala
NW	Rustenburg	Bojanala
NW	Kgetlengrivier	Bojanala
NW	Moses Kotane	Bojanala
NW	Madibeng	Bojanala
NW	Moretele	Bojanala
NW	City of Matlosana	Dr Kenneth Kaunda
NW	Ventersdorp/Tlokwe	Dr Kenneth Kaunda

5.7.4 NSAA Three: National Resource Risk Areas

Figure 54: National Resource Risk Areas Overview



National Resource Risk Area: (1) Nkangala, (2) Olifants, (3) Waterberg, (4) Umgeni, (5) Berg, and (6) Breede River Catchments

5.7.4.1 Significance of the National Resource Risk Areas as NSAAs

These are areas that are of national importance to the economy of the country and the lives of its people. They are under severe stress from an ecological perspective, while also being 'resource critical regions' for other economic sectors, such as mining, agriculture and human settlement. Water is not only a vital resource in the mining activities that drive the energy sector, but also crucial for (1) the strong agricultural sector in these areas, and for (2) energy-generation at coal fired power plants, i.e. the Olifants, Upper Vaal and Waterberg catchment areas. Keeping these economies going, and expanding them further, as is currently happening in a number of these catchment areas, (1) poses a serious risk to the quantity and quality of the water supplied by these areas to the country as a whole, and (2) presents the country with a serious conundrum and set of trade-offs. At the moment, however, the trade-offs between water, food and energy security in these areas (and the knock-on effects in other places) are playing out in a largely *ad hoc* way. It is, however, not due to lack of awareness and concern, as numerous plans refer to the challenge. The problem is that not much has been done to date, with *urgent engagement being required* with regards to the following trade-offs:

- *Upper Vaal region (Mpumalanga):* Coal mining, energy generation SWSAs and high-potential agricultural land;
- *Greater uMngeni region (KwaZulu-Natal):* Water supply for eThekwini, intensive agriculture and expanding settlements;
- *Waterberg region (Limpopo):* Mining, water, energy generation and future expansion of the area driven as a national priority;
- *Olifants Water Management Area (Mpumalanga and Limpopo):* Irrigation schemes, major water quality issues, and pressure from mining activities and energy generation; and
- *Berg and Breede River Catchments (Western Cape):* High-production agriculture, food security and water supply for the Cape Town urban region.

5.7.4.2 Focus of Actions and Interventions

Guided by **the Ideal National Spatial Development Patterns** and the **NSDF Sub-Frames**, the following proposals are made:

- Attend, as a matter of urgency, to areas were land-use and water competition and pollution are (1) causing severe risks to stressed catchments in fulfilling their roles, and (2) placing downstream dependent regions at risk;
- Rehabilitate degraded and/or contaminated areas to play their crucial roles in national (1) food production, and (2) surface and ground water production and supply;
- Plan and prepare for climate change, not only in the areas themselves, but also for the knock-on effects of climate change in other parts of the country and in neighbouring countries;
- Attend to capacity and resource-constraints at provincial, regional and local levels, with national sector departments responsible for environmental affairs and spatial planning playing a key role in this regard;
- Avoid approving applications and proposals for land-uses that reduce stream flow or affect water quality (e.g. mining operations and huge plantations) in SWSAs;
- Keep wetlands in good condition, rehabilitate ones in need of it, and clear invasive alien plants form these areas;
- Restore, manage and wisely use CBAs and SWSAs to support eco-enterprise activities and related livelihood opportunities;
- Prepare an integrated development and resource management plans with an explicitly (1) spatial approach and (2) a strategic national perspective, for each of these areas, possibly a Regional SDF;[xviii] and
- Ensure coordinated State intervention in these areas, with provincial governments, in collaboration with the institution responsible for NSDF implementation, spearheading such action.

In the following figures (**Figures 55 to 59**) and tables (**Tables 10 to 21**), (1) a spatial image of each of the three National Resource Risk Areas, (2) a

summary of the key statistics regarding each of the areas, (3) the names of the affected municipalities in each of the areas, and (4) the names of the key settlements in each of the areas is provided.

Figure 55: Upper Vaal River Catchments Close-Up

Table 10: Upper Vaal River Catchment population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	615 318	1.1%
Youth (under 35)	394 519	1.1%
Population 2030 (medium growth)	765 551	1.2%
Population 2050 (medium growth)	958 133	1.3%
Total GVA 2016 (R mil)	39 044.06	1.5%
Unemployed 2016	64 987	1.1%
Poor Households 2011	29 391	1.0%
Productive land: +/- 19 500 km^2 = 3% of national productive land, and 97% of the entire extent of the catchment.		

National System of Nodes and Corridors Elements:

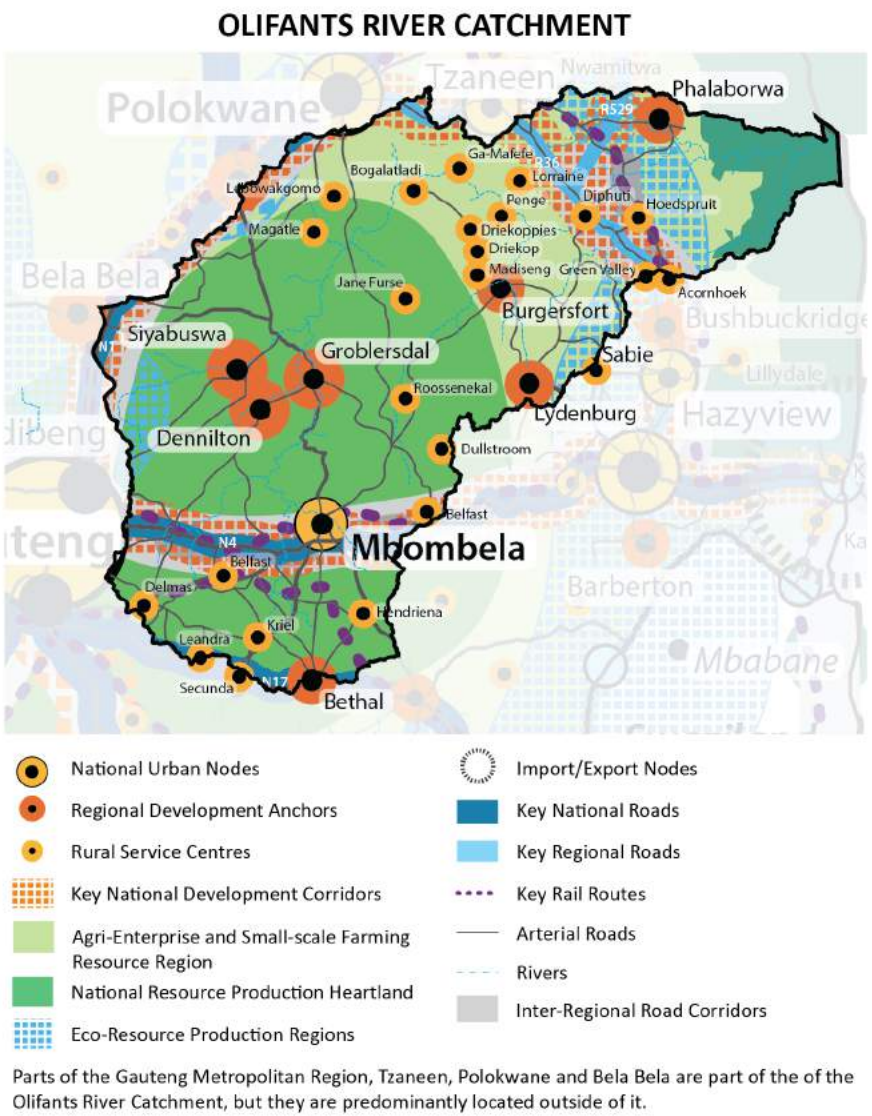
- **Regional Development Anchors:** Standerton, Ermelo, Bethal and Secunda; and
- **Rural Service Centres:** Memel, Vrede, Villiers, Amersfoort and Morgenzon.

Table 11: Upper Vaal River Catchment affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
FS	Mafube	Fezile Dabi (part of)
FS	Metsimaholo	Fezile Dabi (part of)
FS	Phumelela	Thabo Mofutsanyane (part of)
GT	Midvaal	Sedibeng (part of)
KZN	Dannhauser	Amajuba
KZN	Newcastle	Amajuba
MP	Dipaleseng	Gert Sibande (part of)

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
MP	Dr Pixley Ka Isaka Seme	Gert Sibande (part of)
MP	Govan Mbeki	Gert Sibande (part of)
MP	Lekwa	Gert Sibande
MP	Mkhondo	Gert Sibande
MP	Msukaligwa	Gert Sibande
NW	City of Matlosana	Dr Kenneth Kaunda (part of)
NW	Ventersdorp/Tlokwe	Dr Kenneth Kaunda (part of)

Figure 56: Olifants River Catchments Close-Up



Parts of the Gauteng Metropolitan Region, Tzaneen, Polokwane and Bela Bela are part of the of the Olifants River Catchment, but they are predominantly located outside of it.

Table 12: Olifants River Catchment population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	3 520 066	6.3%
Youth (under 35)	2 319 900	6.4%
Population 2030 (medium growth)	4 259 832	6.5%
Population 2050 (medium growth)	4 899 302	6.5%
Total GVA 2016 (R mil)	154 213.09	5.8%
Unemployed 2016	396 962	6.9%
Poor Households 2011	215 232	7.3%
Productive land: +/- 41 200km^2 = 6.3% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Cores:** Witbank and parts of the Gauteng Metropolitan Region, Tzaneen and Polokwane;
- **Regional Development Anchors:** Bethal, Lydenburg, Groblersdal, Siyabuswa-Dennilton, Burgersfort, Phalaborwa and parts of Bela Bela; and
- **Rural Service Centres:** Leandra, Kriel, Hendriena, Delmas, Ogies, Belfast, Dullstroom, Roossenekal, Sabie, Jane Furse, Acornhoek, Madiseng, Magatle, Diphuti, Penge, Hoedspruit, Lebowakgomo, Bogalatladi, Lorraine and Ga-Mafefe.

Table 13: Olifants River Catchment affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
GT	N/A	City of Tshwane (part of)
GT	N/A	Ekurhuleni
GT	Lesedi	Sedibeng
LIM	Lepele-Nkumpi	Capricorn
LIM	Polokwane	Capricorn (part of)
LIM	Ba-Phalaborwa	Mopani (part of)
LIM	Greater Tzaneen	Mopani (part of)
LIM	Maruleng	Mopani
LIM	Elias Motsoaledi	Sekhukhune
LIM	Ephraim Mogale	Sekhukhune
LIM	Greater Tubatse/Fetakgomo	Sekhukhune
LIM	Makhuduthamaga	Sekhukhune
LIM	Bela-Bela	Waterberg (part of)
LIM	Modimolle/Mookgophong	Waterberg (part of)
LIM	Mogalakwena	Waterberg
MP	Bushbuckridge	Ehlanzeni (part of)
MP	Thaba Chweu	Ehlanzeni (part of)
MP	Chief Albert Luthuli	Gert Sibande
MP	Govan Mbeki	Gert Sibande (part of)
MP	Msukaligwa	Gert Sibande (part of)
MP	Dr JS Moroka	Nkangala
MP	Emakhazeni	Nkangala (part of)
MP	Emalahleni	Nkangala
MP	Steve Tshwete	Nkangala
MP	Thembisile	Nkangala
MP	Victor Khanye	Nkangala

Figure 57: Waterberg River Catchment Close-Up

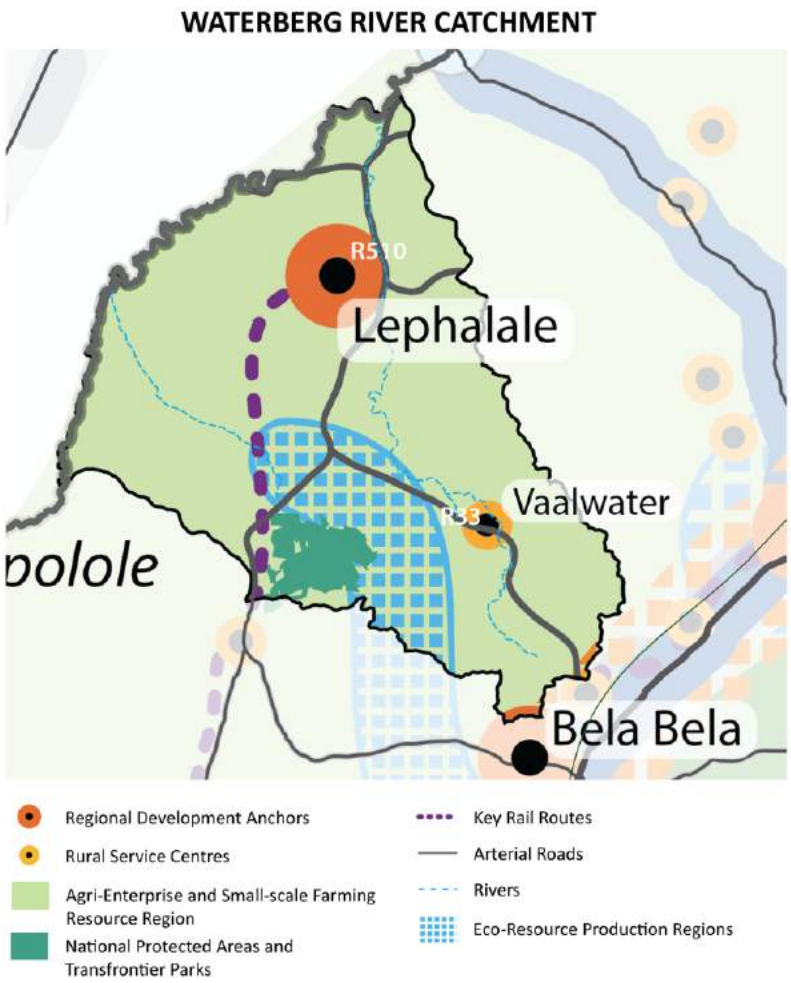


Table 14: Waterberg River Catchment population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	571 355	1.0%
Youth (under 35)	343 379	1.0%
Population 2030 (medium growth)	672 377	1.0%
Population 2050 (medium growth)	807 616	1.1%
Total GVA 2016 (R mil)	26 473.40	1.0%
Unemployed 2016	33 569	0.6%
Poor Households 2011	3 489	0.1%
Productive land: +/- 11 000km^2 = 1.7% of national productive land		

National System of Nodes and Corridors Elements:

- **Regional Development Anchor:** Lephalale; and
- **Rural Service Centre:** Vaalwater.

Table 15: Waterberg River Catchment affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
LIM	Bela-Bela	Waterberg
LIM	Lephalale	Waterberg (part of)
LIM	Modimolle/Mookgophong	Waterberg (part of)
LIM	Thabazimbi	Waterberg (part of)

Figure 58: uMngeni River Catchments Close-Up

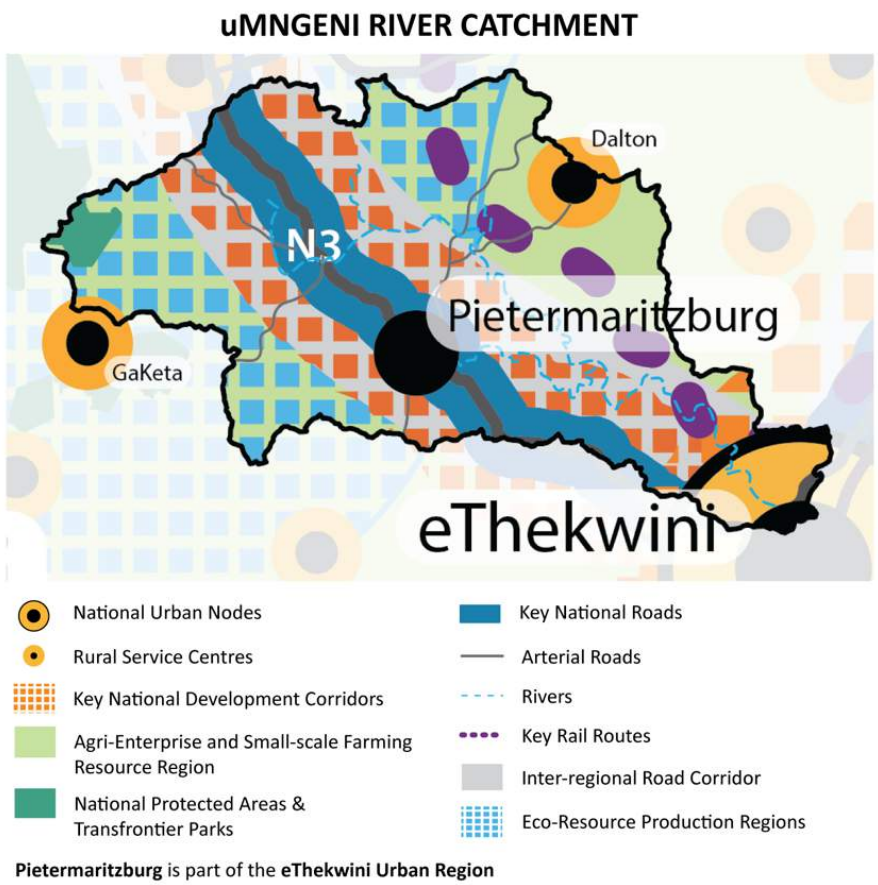


Table 16: uMngeni River Catchment population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	2 049 458	3.7%
Youth (under 35)	1 317 793	3.7%
Population 2030 (medium growth)	2 547 224	3.9%
Population 2050 (medium growth)	3 019 055	4.0%
Total GVA 2016 (R mil)	99 553.24	3.7%
Unemployed 2016	237 634	4.2%
Poor Households 2011	144 415	4.9%
Productive land: +/- 4 200km^2 = 0.66% of national productive land		

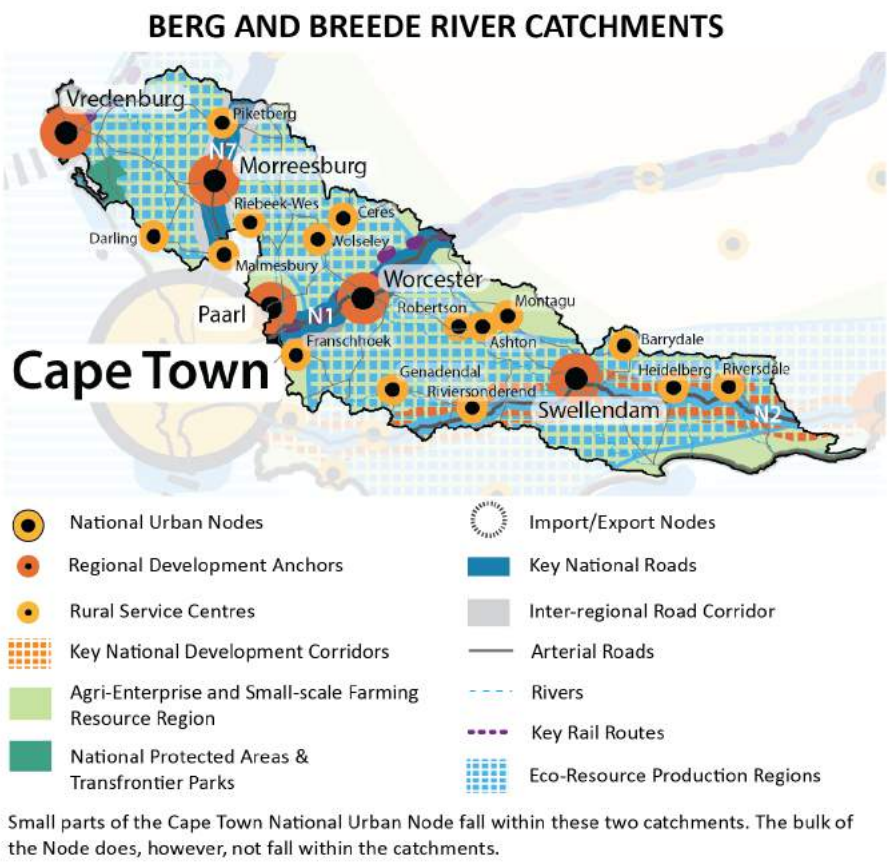
National System of Nodes and Corridors Elements:

- **Urban Region:** The eThekwini Urban region; and
- **Rural Service Centres:** GaKeta, Dalton.

Table 17: uMngeni River Catchment affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
KZN	N/A	eThekwini (part of)
KZN	Ndwedwe	iLembe (part of)
KZN	Impendle	Umgungundlovu (part of)
KZN	Mkhambathini	Umgungundlovu (part of)
KZN	Mpofana	Umgungundlovu
KZN	Richmond	Umgungundlovu
KZN	The Msunduzi	Umgungundlovu (part of)
KZN	uMngeni	Umgungundlovu (part of)
KZN	uMshwathi	Umgungundlovu (part of)
KZN	Umvoti	Umzinyathi

Figure 59: Berg & Breede River Catchments Close-Up



Small parts of the Cape Town National Urban Node fall within these two catchments. The bulk of the Node does, however, not fall within the catchments.

Table 18: Berg River Catchment population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	2 049 458	1.0%
Youth (under 35)	1 317 793	1.0%
Population 2030 (medium growth)	2 547 224	1.0%
Population 2050 (medium growth)	3 019 055	1.0%
Total GVA 2016 (R mil)	99 553.24	1.0%
Unemployed 2016	237 634	0.6%
Poor Households 2011	144 415	0.6%
Productive land: +/- 4 900km^2 = 0.8% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Region:** Small parts of the Cape Town Urban Region;
- **Regional Development Anchors:** Paarl – Wellington, Moorreesburg, and Vredenburg; and
- **Rural Service Centres:** Darling, Riebeek-Wes, Piketberg, Wolseley, Ceres, Franschhoek, Genadendal, Riviersonderend, Ashton, Montagu, Barrydale, Heidelberg and Riversdale.

Table 19: Berg River Catchment affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
WC	Breede Valley	Cape Winelands
WC	Drakenstein	Cape Winelands (part of)
WC	Stellenbosch	Cape Winelands (part of)
WC	Witzenberg	Cape Winelands (part of)
WC	N/A	City of Cape Town (part of)
WC	Theewaterskloof	Overberg

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
WC	Bergrivier	West Coast (part of)
WC	Cederberg	West Coast
WC	Saldanha Bay	West Coast
WC	Swartland	West Coast (part of)

Table 20: Breede River Catchment population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	507 226	0.9%
Youth (under 35)	299 843	0.8%
Population 2030 (medium growth)	534 316	0.8%
Population 2050 (medium growth)	577 511	0.8%
Total GVA 2016 (R mil)	22 249.21	0.8%
Unemployed 2016	21 254	0.4%
Poor Households 2011	16 234	0.6%
Productive land: +/- 11 200 km^2 = 1.7 % of national productive land		

National System of Nodes and Corridors Elements:

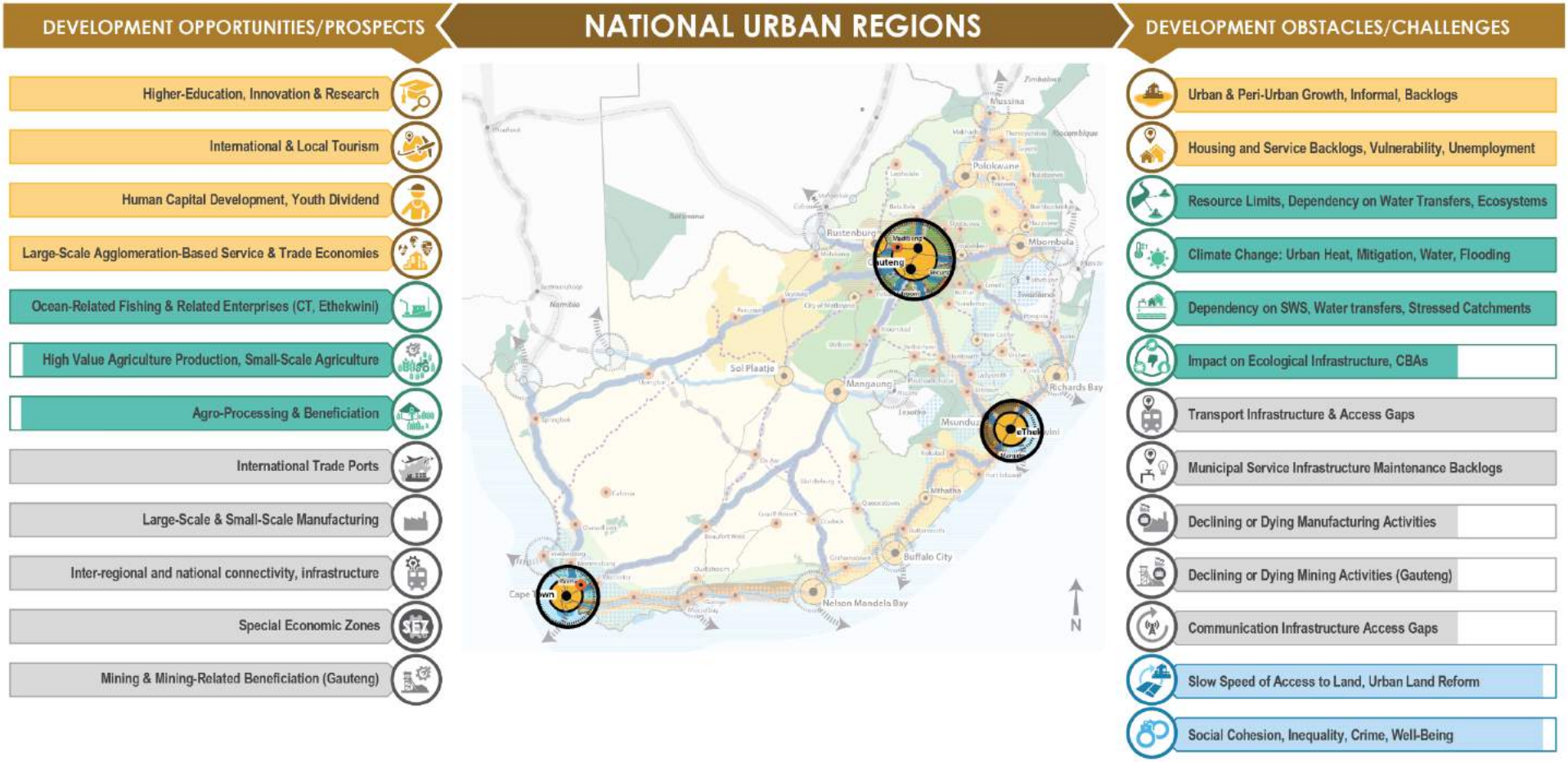
- **Urban Region:** Small parts of the Cape Town Urban Region;
- **Regional Development Anchors:** Swellendam and Worcester; and
- **Rural Service Centres:** Riviersonderend, Genadendal, Heidelberg, Riversdale, Franschhoek, Barrydale, Ashton, Robertson, Montagu, Wolseley and Ceres.

Table 21: Breede River Catchment affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
WC	Breede Valley	Cape Winelands (part of)
WC	Drakenstein	Cape Winelands (part of)
WC	Langeberg	Cape Winelands (part of)
WC	Stellenbosch	Cape Winelands (part of)
WC	Witzenberg	Cape Winelands (part of)
WC	N/A	City of Cape Town (part of)
WC	Hessequa	Eden (part of)
WC	Cape Agulhas	Overberg
WC	Swellendam	Overberg (part of)
WC	Theewaterskloof	Overberg (part of)

5.7.5 NSAA Four: National Urban Regions

Figure 60: National Urban Regions Overview



5.7.5.1 Significance of the National Urban Regions as NSAAs

More than half of the country's population already live in urban regions and cities, with this trend set to continue well into the future. In addition to being 'home' to millions of our people, three main urban regions are also where:

- The bulk of the country's economic activities, and those economic activities of highest value, are concentrated;
- The national transition to a high-value service-based economy will be driven and accomplished;
- Prospects for job creation through upstarts, small-scale activities and the arts, culture and entertainment industries are greatest;
- The youth dividend must be reaped; and
- The bulk of (1) imports and exports, and (2) tourists visiting the country, pass through.

As such, these spaces, small in size, but huge in terms of population, economic activity and opportunity, are fundamental to the future of the country. Powerful as they are, they are struggling to deal with the challenges of service provision, housing, unemployment, crime, environmental degradation, transport and infrastructure maintenance. I addition to this, they also still struggle with the legacy of spatial segregation and exclusion.

Due to their economic and social significance, these regions face not only natural population growth but also in-migration of people hoping to tap into the benefits and opportunities of urban areas. Ensuring not only sustainable economic growth, but also spatial transformation and inclusive economic growth in these regions will be key contributors to realising the desired **Ideal National Spatial Development Pattern**.

5.7.5.2 Focus of Actions and Interventions

Guided by **the Ideal National Spatial Development Patterns** and the **NSDF Sub-Frames**, the following proposals are made:

- Plan for and undertake infrastructure maintenance at scale, to (1) ensure economic vitality, and (2) avoid human health and safety risks because of ageing infrastructure, lack of maintenance and damage by climate change-related hazards on water, sanitation, storm water, transport and electricity networks;
- Develop specific funding, land access, land tenure and service provision mechanisms to (1) enable higher residential densities, (2) provide a range of housing options, (3) alleviate pressure on basic and social service provision, (4) optimise urban land reform dividends, (5) manage urban growth, and (6) provide effective mass public transport;
- Support small-scale farmers in the regions to improve food security and employment;
- Support innovation and skills development in growing economic sectors, with a focus on youth development and employment at scale;
- Support and maintain key export routes and ports; and
- Prepare for climate change by amongst other measures, initiating an in-depth study into *the long-term impacts of climate change on the core urban areas of the country*, and developing mitigation and adaptation strategies, e.g. desalination, urban food production, and low/no-carbon energy generation, based on the findings of the study.

In the following figures (**Figures 61 to 63**) and tables (**Tables 22 to 27**), (1) a spatial image of each of the three National Urban Regions, (2) a summary of the key statistics regarding each of the regions, (3) the names of the affected municipalities in each of the regions, and (4) the names of the key settlements in each of the regions is provided.

Figure 61: Greater Gauteng Region Close-Up

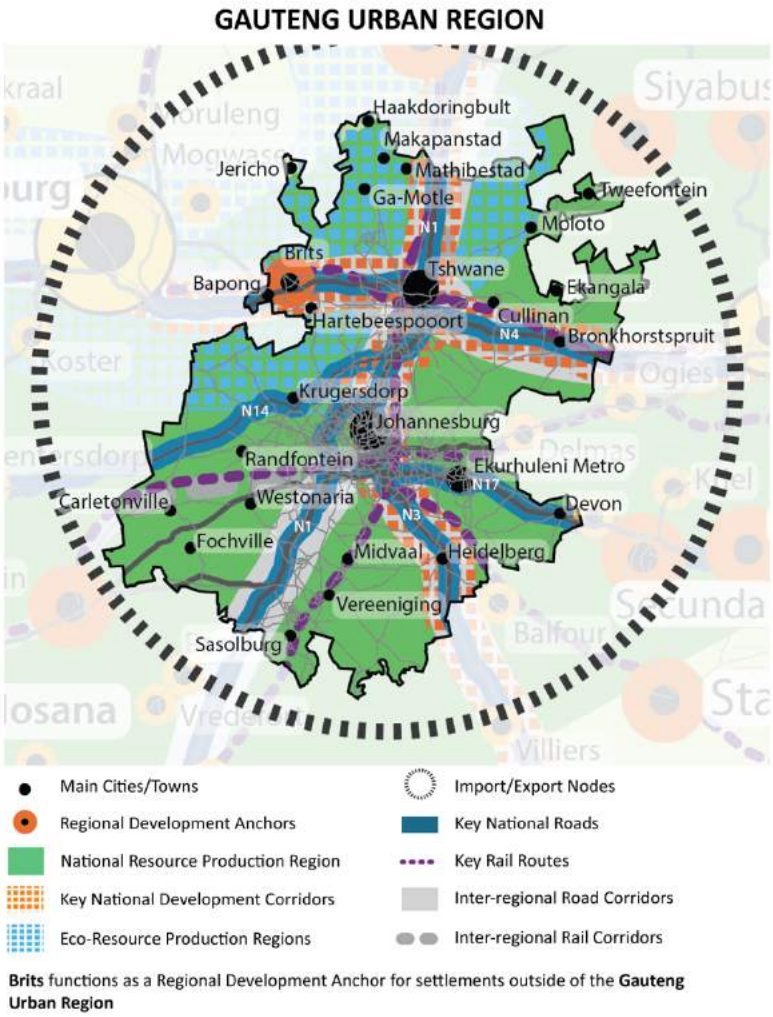


Table 22: Greater Gauteng Region population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	14 846 703	26.6%
Youth (under 35)	9 295 730	25.8%
Population 2030 (medium growth)	17 863 527	27.4%
Population 2050 (medium growth)	21 683 800	28.9%
Total GVA 2016 (R mil)	975 092.82	36.4%
Unemployed 2016	1 790 760	31.2%
Poor Households 2011	589480	29.0%
Productive land: +/-19 200 km^2 = 2.95% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Region:** The Gauteng Metropolitan Region; and
- **Regional Development Anchors:** Brits.

Table 23: Greater Gauteng Region affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
FS	Metsimaholo	Fezile Dabi (part of)
GT	N/A	City of Johannesburg
GT	N/A	City of Tshwane
GT	N/A	Ekurhuleni
GT	Emfuleni	Sedibeng
GT	Lesedi	Sedibeng
GT	Midvaal	Sedibeng
GT	Merafong City	West Rand
GT	Mogale City	West Rand
GT	Rand West City	West Rand
MP	Thembisile	Nkangala (part of)

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
NW	Madibeng	Bojanala (part of)
NW	Moretele	Bojanala (part of)

Figure 62: Greater Cape Town Close-Up

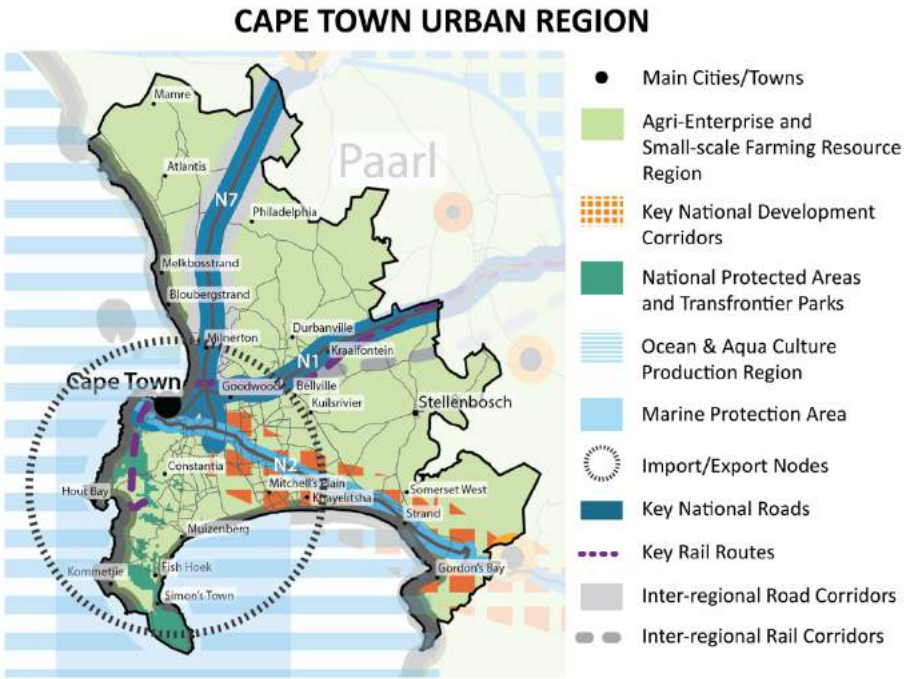


Table 24: Greater Cape Town Region population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	4 243 363	7.61%
Youth (under 35)	2 550 481	7.08%
Population 2030 (medium growth)	4 989 264	7.64%
Population 2050 (medium growth)	5 781 830	7.70%
Total GVA 2016 (R mil)	276 706.42	10.33%
Unemployed 2016	404 661	7.07%
Poor Households 2011	189 728	6.4%
Productive land: +/- 2 500km^2 = 0.4% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Region:** The City of Cape Town Urban Region.

Table 25: Greater Cape Town Region affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
WC	Stellenbosch	Cape Winelands (part of)
WC	Swartland	West Coast (part of)
WC	City of Cape Town	City of Cape Town

Figure 63 :Greater eThekwini Region

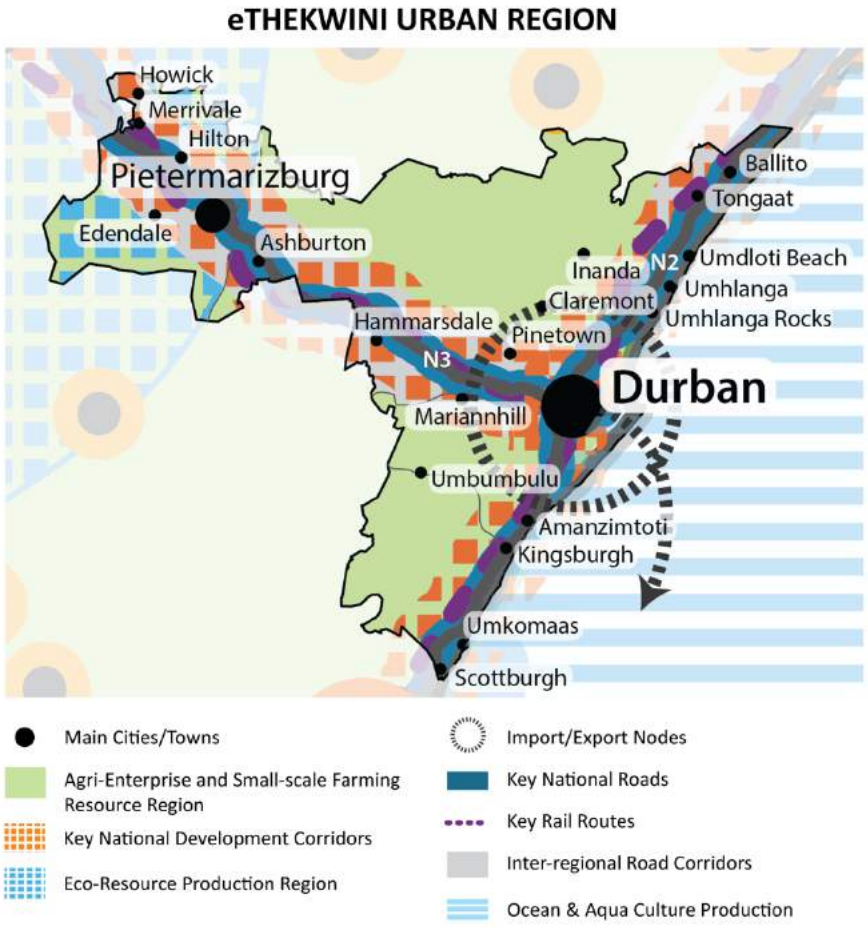


Table 26: Greater eThekwini Region population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	4 571 794	8.2%
Youth (under 35)	2 936 152	8.2%
Population 2030 (medium growth)	5 534 789	8.5%
Population 2050 (medium growth)	6 447 311	8.6%
Total GVA 2016 (R mil)	278 492.51	10.4%
Unemployed 2016	538 669	9.4%
Poor Households 2011	256 731	8.7%
Productive land: +/-3 800 km^2 = 0.6% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Region:** The eThekwini Urban Region.

Table 27: Greater eThekwini Region affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
KZN	Umdoni	Ugu (part of)
KZN	KwaDukuza	iLembe (part of)
KZN	Ndwedwe	iLembe (part of)
KZN	Richmond	Umgungundlovu (part of)
KZN	uMshwathi	Umgungundlovu (part of)
KZN	N/A	eThekwini
KZN	Mkhambathini	Umgungundlovu (part of)
KZN	Msunduzi	Umgungundlovu (part of)
KZN	uMngeni	Umgungundlovu (part of)

5.7.6 NSAA Five: Arid-Innovation Region

Figure 64: Arid-Innovation Region Overview

5.7.6.1 Significance of the Arid Innovation Region as NSAA

This region comprises the arid and sparsely populated western and southwestern central parts of the country. It is set to be significantly affected by future climate change trends, notably (1) higher temperatures and (2) less rainfall in large parts of the region, requiring a consolidated response.

In terms of the key characteristics of region:

- The towns, their inhabitants, their economies and the economy of the wider arid region in which they are located, are under constant threat from a limited availability of water; and
- Most of the towns are heavily reliant on a single economic sector, typically agriculture or mining. This makes them very vulnerable to (1) *external factors,* such as currency fluctuations, trade disputes and changes in the demand for commodities, and (2) *more local factors,* notably climate change in the form of a significant rise in temperature, more very hot days, a greater risk of veld fires, and the advent of even drier conditions and water shortages.

Due to current challenges and increasing climatic pressures, this region requires a range of targeted interventions. This is necessary to ensure the future well-being of its inhabitants, the health of its economy and the sustainable use of its natural resources. It is also important to harness the nationally significant opportunities of this region, including its niche agricultural activities and fisheries, mineral deposits, potential for alternative energy generation and contribution to the international scientific community through the SKA.

5.7.6.2 Focus of Actions and Interventions

Guided by **the Ideal National Spatial Development Patterns** and the **NSDF Sub-Frames**, the following proposals are made:

- Pursue regional adaptation, economic diversification and agri-innovation at scale, to ensure greater resilience of livelihoods in the region;
- Limit expansion and development of new settlements in very arid areas, and pursue and support compact settlement development around social service nodes and taxi routes in towns and villages, within assured water availability limits;
- Enhance regional, cross-provincial and cross-municipal boundary collaborative spatial development planning and governance;
- Establish strong regional growth and development compacts, including all role-players, i.e. the three spheres of government, traditional leaders, communities (notably youth), the private sector, CBOs, NGOs and organised labour;[xix]
- Encourage and support inhabitants of such towns to become self-sufficient and 'go off the gird' with regards to (1) water, electricity and sanitation services, and (2) food production;
- Enhance ICT linkages, to support distance-learning and provide access to other social services; and
- Discourage new temporary settlement formation for mining or large-scale construction projects, e.g. the building of a solar-plant) by facilitating housing-provision in closest existing regional development anchors and/or regional service towns and support with public transport.

Figure 65: Arid-Innovation Region

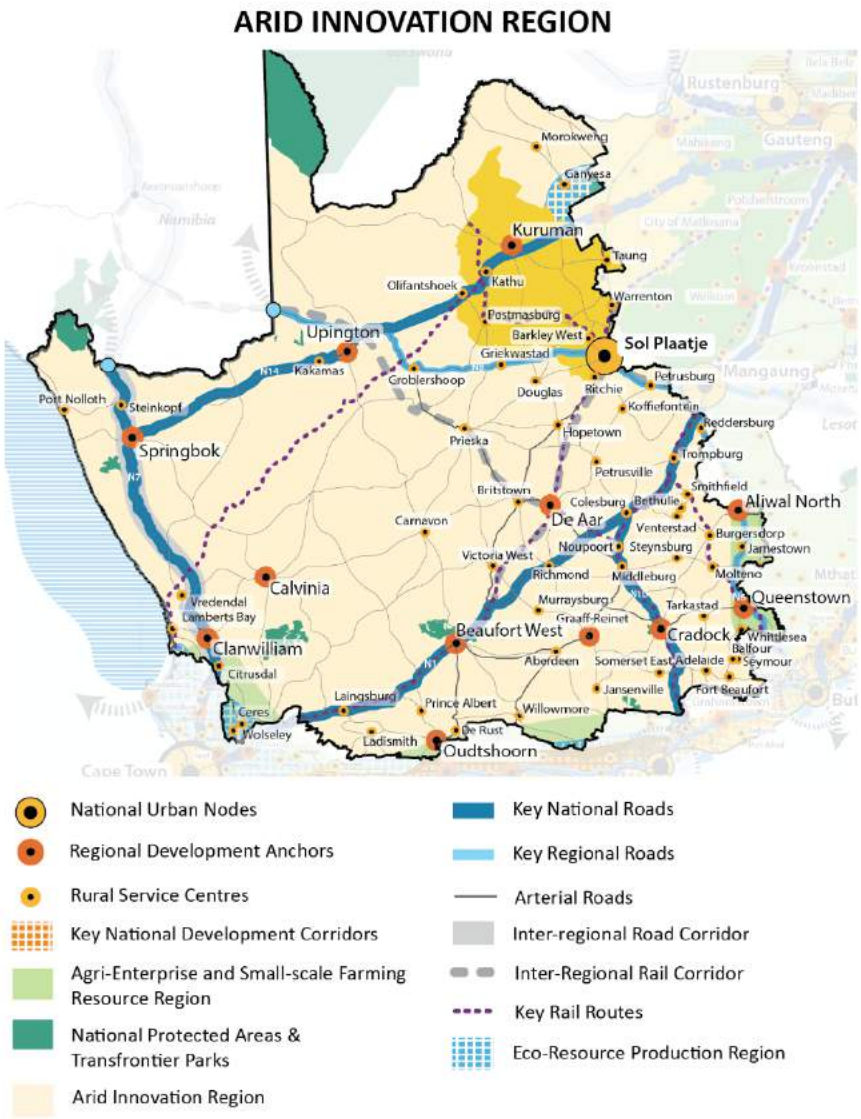


Table 28: Arid-innovation Region population and economy

CATEGORY	TOTAL	% OF NATIONAL
Population 2016	2 646 251	4.7%
Youth (under 35)	1 655 521	4.6%
Population 2030 (medium growth)	2 900 485	4.4%
Population 2050 (medium growth)	3 102 292	4.1%
Total GVA 2016 (R mil)	100 694.91	3.7%
Unemployed 2016	215 642	3.8%
Poor Households 2011	118 713	4.0%
Productive land: +/- 132 000 km^2 = 20% of national productive land		

National System of Nodes and Corridors Elements:

- **Urban Core:** Sol Plaatje;
- **Regional Development Anchors:** Oudtshoorn, Beaufort West, Clanwilliam, Graaff Reinet, Cradock, Queenstown, Calvinia, Aliwal North, De Aar, Springbok, Upington and Kuruman; and
- **Rural Service Centres:** Ladismith, Wolseley, De Rust, Ceres, Willowmore, Laingsburg, Prince Albert, Jansenville, Fort Beaufort, Somerset East, Adelaide, Citrusdal, Seymour, Aberdeen, Lamberts Bay, Whittlesea, Tarkastad, Murraysburg, Vredendal, Middelburg, Molteno, Victoria West, Steynsburg, Noupoort, Jamestown, Burgersdorp, Carnarvon, Venterstad, Colesberg, Britstown, Bethulie, Petrusville, Trompsburg, Prieska, Reddersburg, Hopetown, Port Nolloth, Koffiefontein, Steinkopf, Petrusburg, Douglas, Ritchie, Groblershoop, Griekwastad, Kakamas, Barkly West, Postmasburg, Warrenton, Taung, Ganyesa, Morokweng and Olifantshoek.

Table 29: Arid-Innovation Region affected municipalities

PROVINCE	LOCAL MUNICIPALITY	DISTRICT/METROPOLITAN MUNICIPALITY
EC	Blue Crane Route	Cacadu
EC	Dr Beyers Naude	Cacadu
EC	Enoch Mgijima	Chris Hani
EC	Inxuba Yethemba	Chris Hani
EC	Raymond Mhlaba	Amathole
EC	Walter Sisulu	Joe Gqabi
FS	Kopanong	Xhariep
FS	Letsemeng	Xhariep
NC	!Kheis	Z F Mgcawu
NC	Dawid Kruiper	Z F Mgcawu
NC	Dikgatlong	Frances Baard
NC	Emthanjeni	Pixley ka Seme
NC	Gamagara	John Taolo Gaetsewe
NC	Ga-Segonyana	John Taolo Gaetsewe
NC	Hantam	Namakwa
NC	Joe Morolong	John Taolo Gaetsewe
NC	Kai !Garib	Z F Mgcawu
NC	Kamiesberg	Namakwa
NC	Kareeberg	Pixley ka Seme
NC	Karoo Hoogland	Namakwa
NC	Kgatelopele	Z F Mgcawu
NC	Khâi-Ma	Namakwa
NC	Magareng	Frances Baard
NC	Nama Khoi	Namakwa
NC	Renosterberg	Pixley ka Seme
NC	Richtersveld	Namakwa
NC	Siyancuma	Pixley ka Seme
NC	Siyathemba	Pixley ka Seme
NC	Sol Plaatjie	Frances Baard
NC	Thembelihle	Pixley ka Seme
NC	Tsantsabane	Z F Mgcawu
NC	Ubuntu	Pixley ka Seme
NC	Umsobomvu	Pixley ka Seme
NW	Greater Taung	Dr Ruth Segomotsi Mompati
NW	Kagisano/Molopo	Dr Ruth Segomotsi Mompati
WC	Beaufort West	Central Karoo
WC	Cederberg	West Coast
WC	Kannaland	Eden
WC	Laingsburg	Central Karoo
WC	Matzikama	West Coast
WC	Oudtshoorn	Eden
WC	Prince Albert	Central Karoo
WC	Witzenberg	Cape Winelands

5.7.7 Implementation: Roles and Responsibilities

Table 30: Implementation Roles and Responsibilities

NSAA	LEAD ROLE PLAYERS	OTHER IMPORTANT ROLE PLAYERS	INTERVENTIONS: 5 YEAR HORIZON

National Transformation Corridors	Department of Planning, Monitoring and Evaluation
	
	Department of Rural Development and Land Reform
	
	Department of Cooperative Governance and Traditional Affairs
	
	Eastern Cape Province (Coastal Transformation Corridor)
	
	Mpumalanga and Limpopo Provinces (Eastern Escarpment Transformation Corridor)
		National and Provincial Environmental Departments
		
		National Department of Water and Sanitation
		
		National and Provincial Agriculture, Forestry and Fishery Departments
		
		National and Provincial Transport/Public Works Departments
		
		National and Provincial Human Settlements
		
		Department of Energy
		
		Provincial and National Tourism
		
		Affected Municipalities
		
		SALGA
			• Awareness raising among relevant national, provincial and municipal stakeholders of the provisions and directives of the NSDF for the corridor.
			• A Regional SDF addressing and/or providing for at least the following aspects and issues in the corridor:
			  ○ The regional urban network, including urban cores, regional development anchors and rural service centres, including an audit of current service levels for each element of the network;
			  ○ New and upgraded strategic regional infrastructure to connect elements of the regional urban network;
			  ○ Environmental and resource management measures, taking cognisance of climate change risks and pressures;
			  ○ Development management measures to solidify the regional urban network, e.g. urban and rural edges, and densification and de-densification strategies;
			  ○ Catalytic economic projects, including a focus on eco-production and livelihood, agri-enterprise, strengthening of small-scale farming areas, high-value tourism and the marine economy; and
			  ○ A Five-year Implementation plan including partnerships in the region between traditional leaders, the provincial government, municipalities, civil society and business required.
			• Land reform that is cognisant of the critical future role of the corridors in national economic development.
			• Review of relevant provincial and municipal planning and implementation frameworks to accommodate measures identified in the RSDF.

NSAA	LEAD ROLE PLAYERS	OTHER IMPORTANT ROLE PLAYERS	INTERVENTIONS: 5 YEAR HORIZON
			• Strengthening of local government through capacity building and financial strategies focussed on increasing income and decreasing grant-dependency, and relationship-building with traditional leadership.
Central Innovation Belt	Department of Planning, Monitoring and Evaluation Department of Rural Development and Land Reform	Provinces: Gauteng, Free State, Mpumalanga, North West National and Provincial Economic Development Departments National and Provincial Environmental Departments Department of Water and Sanitation National and Provincial Human Settlements Departments Department of Mineral Resources Department of Energy Affected Municipalities	• Focussed economic development strategy, with a focus on diversification, investment attraction and skills development. The strategy should be formulated in a collaborative manner, including key regional stakeholder such as mining houses, labour organisations, large investors and environmental action groups. • Environmental management measures to mitigate the impact on nationally significant natural resources, including the Vaal catchment area. • The ongoing Vaal RSDF process should take into account regional urban network elements, roles and service profiles, as proposed in the NSDF, and include measures to strengthen and consolidate the settlements in the region by use of the appropriate connecting infrastructure. • Strengthening of local government through capacity building and financial strategies focused on capacity to deal with increased levels of service delivery, economic development and human settlement development.
National Resource Risk Areas	Department of Environmental Affairs	Department of Agriculture	A strategic resource management plan for each of the National Resource Risk Areas that may take the form of a Regional SDF or Environmental Management Plan, or similar suitable measure focussing on:

NSAA	LEAD ROLE PLAYERS	OTHER IMPORTANT ROLE PLAYERS	INTERVENTIONS: 5 YEAR HORIZON
	Department of Water and Sanitation	Department of Mineral Resources Department of Energy and Eskom Department of Rural Development and Land Reform National and Provincial Human Settlements Departments All municipalities & provinces affected Key partnerships / stakeholders such as Strategic Water Partners Network, Mining Houses, Agricultural Organisations	• Identification of the high risk areas per region, including future climate change risks; • Specific measures to conserve quality of water resources; and • Specific measures to manage competition for land, water and energy between land uses, such as agriculture, mining, human settlement and nature conservation.
National Urban Regions	Department of Planning, Monitoring and Evaluation Department of Cooperative	Department of Rural Development and Land Reform National Treasury Department of Water and Sanitation	• Raising of awareness among relevant national, provincial and municipal stakeholders of the provisions of the NSDF for the urban regions and their role in the national economy, population trends and the impact of climate change. • Utilise existing instruments, such as Municipal and Regional Spatial Development Frameworks and Built Environment Performance Plans to place a greater emphasis on:

NSAA	LEAD ROLE PLAYERS	OTHER IMPORTANT ROLE PLAYERS	INTERVENTIONS: 5 YEAR HORIZON
	Government and Traditional Affairs Western Cape Province and affected municipalities Gauteng Province and affected municipalities KZN Province and affected municipalities	Other affected National and Provincial Department per region SALGA SACN Key private sector role players including business, labour, environment and mining	○ Planning for future population growth, including its impact on basic municipal and social services; ○ Mitigation-measures for climate change impact; ○ Economic development including regional and global linkages; and ○ Consolidation, densification and formalisation of urban areas through strict implementation of anti-sprawl measures. • Establishment of an Intergovernmental Forum for each urban region to address the above pressures in a consolidated manner.
Arid-Innovation Region	Department of Rural Development and Land Reform Department of Cooperative Government and Traditional Affairs Northern Cape Province Eastern Cape Province	Affected municipalities National and Provincial Environmental Departments Department of Water and Sanitation Department of Mineral Resources Department of Energy	• Raising awareness among relevant national, provincial and municipal stakeholders of the provisions of the NSDF for the region. • Utilised existing regional planning/Regional Spatial Development Framework processes to focus on the following: ○ Potential change in economic base in response to climate change; ○ Concentration of population in key settlements, and the role of different types of settlement in service provision and employment; ○ Improved linkages between settlements and production areas; ○ Marine economy; and ○ Green energy generation. • Strengthening of local government through capacity-building and financial strategies focussed on increasing income and decreasing grant-dependency.

NSAA	LEAD ROLE PLAYERS	OTHER IMPORTANT ROLE PLAYERS	INTERVENTIONS: 5 YEAR HORIZON
	Western Cape Province	Department of Agriculture, Forestry and Fisheries SALGA	

5.7.8 National Risk of Non-Action

The NSDF seeks to fundamentally and decisively change and transform South Africa from a country shackled by its past, into a truly free and just country that offers a (1) decent quality of life, and (2) a fair chance to make a life, to all who live in it. To this effect it puts forward a series of proposals to bring this transition about, and identified the set of NSAAs, as briefly described in **Section 5.7.6**. Yet, it may be that there is a reluctance, slowness or unwillingness to implement the proposals. The table below (**Table 31**) sets out the risks associated with failure to act *in* and *on* the NSAAs.

Table 31: Risks of Non-Action in/on the NSAAs

HIGH RISKS OF NON-ACTION IN/ON STRATEGIC ACTION AREAS	RESULTANT IMPLICATIONS
Lack of development management in national ecological and biodiversity management areas, such as the Natural Resource Risk Areas and the National Transformation Corridors	• Unmanaged urban growth and land-use resource risk areas and transformation corridors with resultant negative impacts on (1) sensitive ecological infrastructure, (2) the tourism sector, and (3) other economic opportunities of national significance. • 'Running out of water', which will have detrimental effects on (1) all inhabitants dependant on these urban regions, but notably so vulnerable communities, (2) job creation, (3) agriculture and food production, and (4) living costs. • Continued settlement development infiltrating high-value agriculture and strategic national surface water production areas. • Due to the population size and scale of settlement in national urban regions, massive losses of biodiversity and crucial ecosystems services for urban regions, the country at large, and the globe.
Lack of action in areas were land-use and water bodies and production are in competition	• Will most likely cause severe risks to stressed catchments in fulfilling their roles, and place downstream dependent regions at risk. • Could lead to costly pollution and life-threatening toxicity of water bodies and streams with a resultant threat to human, plant and animal life and enormous financial expenses to resolve the matter. • Failure to manage competitive land use between human settlements, water production and food production can result in food and water shortages.
Failure to maintain and improve international trade and movement infrastructure (routes and ports)	• A loss in South Africa's competitive advantage with regards to infrastructure. • Restricting growth and limiting national, SADC, African and global integration. • An increased burden on road networks if the rail network is not attended to.
Failure to improve and extend critical infrastructure and develop the three National Transformation Corridors	• Increased sprawl, loss of high-value agricultural land, loss of surface water production areas, an increase in joblessness and growing frustration and associated risks to national cohesion and stability. • A squandering of a real opportunity to turn around the dreadful spatial, social and economic legacies of Apartheid in what includes large swaths of former Bantustan areas.

HIGH RISKS OF NON-ACTION IN/ON STRATEGIC ACTION AREAS	RESULTANT IMPLICATIONS
Lack of future-orientated, nationally directed urban growth in areas of opportunity	• Urban and settlement growth merely following existing trends (as illustrated through spatial modelling of most likely trends without intervention), which will severely reduce our ability to (1) create viable livelihoods at scale, (2) threaten our natural resources, and (3) reduce government's ability to provide sustainable services in towns. • The legacies of the colonial and Apartheid pasts will become even more deeply entrenched across the national urban-rural landscape. • Towns in arid areas with unfavourable climate conditions will become ever-more exposed to risks that they will most likely not be able to counter or manage.
Ineffective governance, funding shortfalls in the provision of municipal infrastructure, and a lack of a nationally targeted, systematic, systemic and long-term developmental focus on large urban areas, towns and national development corridors with large urban concentrations	• A loss of the opportunity to harness the 'triple dividend' of a youthful population, many of whom are located in urban areas. • A serious likelihood of unmanaged urban growth and land-use in coastal areas with devastating effects on (1) sensitive ecological infrastructure, and (2) related tourism and economic activities and opportunities. • An increasing inability of even large municipalities to meet the growing demands of a fast-growing population, and provide services and sustain environments in which economies can take root and grow, leading to (1) outbreaks of disease with associated chronic public health risks, (2) business closures, (3) more unemployment and more crime, (5) a loss in the quality of life in urban areas, (6) massive social unrest and an increase in xenophobic attacks and violence, (7) the collapse of the Rand and the large-scale departure of local and foreign investors, and (8) the mass emigration of millions of especially young South Africans.

PART SIX: Implementation Framework

6.1 Introduction

The implementation framework outlines the measures, approach and actions required to realising our **National Spatial Development Vision** in a coherent, diligent and systematic way.

The NSDF is aimed at addressing our history of forced removals, spatial segregation and unequal spatial investment. This legacy of colonialism and Apartheid persists to this day, and leads to the perpetuation of inequality, unemployment and poverty. The **Apartheid National Spatial Development Logic** underpinning this legacy has to be disrupted and undone, to enable us to bring about a very different future.

Despite much progress having been made since 1994 in (1) the provision of basic services, (2) housing delivery, and (3) integrated development legislation, policy and planning, the unequal spatial development patterns have continued. We have failed to bring about spatial transformation, i.e. moving from a segregated, unequal and inefficient **Apartheid National Spatial Development Pattern** to a new, integrated, inclusive and sustainable **Ideal National Spatial Development Pattern**.

The major gap in our transformation effort has been at a strategic spatial investment and implementation level, where, despite a sound **National Development Paradigm** including the Constitution, the NDP and a progressive legal and policy framework, we have not been able to disrupt and overcome colonial and apartheid spatial development logics in practice.

The NDP recognises that it is only through *radical and decisive intervention* that is *coherently planned for and managed in the national sphere at the national scale,* that we stand a chance of disrupting the **apartheid spatial logic and space economy**, and overcoming the inequities and distances brought about by colonialism and Apartheid.

The NSDF has been prepared to give effect to the NDP by providing national spatial development guidance and direction. As such, the NSDF is closing the gap in our transformation effort by changing and influencing practice by becoming clearer about (1) the strategic spatial development challenges and opportunities across the country, and (2) the desired **National Spatial Development Outcomes**.

The NSDF's analysis of **National Spatial Development Shapers** indicates the *five key problems* emanating from the current **national spatial development pattern** that the country has to address:

- High pressure on natural resources;
- Inequitable use of land;
- High rates of urbanisation with high pressure and expectations of adequate housing, basic services and jobs;
- High levels of poverty in the former Bantustan and township areas; and
- A disconnected national spatial pattern where there is mis-alignment between where economic activity takes place and where people live, where natural resources are located, and costly infrastructure networks is in place.

The **NSDF's theory of change** presents the pathway from the current situation to the desired spatial future, and the NSDF by:

- Crafting a strong and credible and **Post-Apartheid National Spatial Development Vision**;
- Articulating a compelling and persuasive **Post-Apartheid Spatial Development Logic**;

- Crafting a desired **Post-Apartheid National Spatial Development Pattern**;
- Setting out interventions and actions that are required to bring about the desired **Post-Apartheid National Spatial Development Pattern**; and
- Providing **Implementation Guidance** for realising the desired national spatial transformation.

As such, and it being positioned alongside and in tandem with the NDP, the NSDF, once adopted by Cabinet, will be the **Apex Spatial Plan** for the country, and it will remain so until it is reviewed in the future. This means that henceforth *all spatial plans, investment and projects in the country have to give effect to achieving the NSDF intent and adhere to the NSDF Frames and Guidelines.*

In order to transcend the "practice gap", there will be a rigorous focus on holding all three spheres of government, sector departments and social actors **accountable** for their (1) planning, (2) investment decisions and (3) delivery programmes, according to the extent to which these processes advance the objectives of the NDP and the NSDF, and adhere to the spatial development guidance and directives of the NSDF.

6.2 Preparing for Success

The successful implementation of the NSDF is dependent on all role players within and outside of government understanding the spatial guidance and directives, and interpreting, advancing, applying and adhering to these.

The scale of spatial change identified over the 2050-horizon as well as the limited window of opportunity to realise the demographic and urban dividend, means that there has to be an acceleration towards the desired spatial future pathway and outcomes. This will require (1) a renewed vigour, belief and urgency, (2) a posture of excellence and country success, and (3) retooled and even new capabilities to build an inclusive and prosperous society in a far more focused and methodical manner.

The NSDF guides and promotes coordinated work across government and society where every national department, state entity, province, municipality, civil society organisation, private sector, and the public has to:

- Be aware of and appreciate the national spatial transformation imperative of the country;
- Understand and promote the **National Spatial Development Vision 2050**, and commit to realising the vision; and
- Be accountable for the spatial impact of planning, investment and actions as they relate to achieving the **Ideal National Spatial Development Pattern** and the spatial transformation of places.

The state will lead the process under the framework of the NDP by ensuring a cohesive government approach with the NSDF sitting complementarily to the NDP at the apex of the country's spatial development planning system. The implementation of the NSDF operates as such within the constitutional framework of the country, as well as within the precepts of the *Intergovernmental Relations Framework Act, 2005*, with regards to coordinating the implementation of national priorities, and in furthering the objectives set out in SPLUMA, in particular:

- The NSDF has to indicate the desired patterns of land use in the country and guide and direct provincial and municipal SDFs accordingly; and

- The NSDF has to guide planning and development across all sectors of the national sphere of government, and contribute to a coherent planned approach to spatial development in the three spheres of government.

Implementation of the NSDF entails the process of adapting and improving the process of development planning across government and ensuring that it informs government (corporate/departmental) planning, budgeting (investment), delivery and enforcement (spatial governance), to achieve the desired national spatial development outcomes.

The NDP-NSDF at the apex of the country's development planning system informs the government (or corporate/organizational) planning cycle. The development plans (sector strategies, provincial growth and development strategies and provincial spatial development frameworks, municipal integrated development plans and spatial development frameworks) are strategic, integrated and/or sector-wide long-term plans, whilst the corporate plans are short-medium term departmental plans (national, provincial and municipal) linked to the Medium Term Strategic Framework (MTSF) and the annual and three-year multi-year budgeting (MTEF) cycle.

The successful implementation of the NSDF will require additional and more appropriate capacity to be developed across government for this approach to long-term strategic planning, investment have a positive spatial development impact on delivery. All departments, state entities, provinces and municipalities will have to (1) retool existing capabilities, and (2) find, or augment capacity for the new task at hand, working together with industry, tertiary institutions and professional bodies.

This must also be an opportunity to tap into the agility and resourcefulness of young planners and nurture and fast-track young talented planners who have the passion and drive for making a better future.

6.3 Work Streams

The implementation of the NSDF refers to what in essence are four processes running in parallel and these are accordingly arranged into four interrelated **work streams**, i.e.:

- **Workstream 1:** Championing and Support;
- **Workstream 2:** Development Planning Alignment;
- **Workstream 3:** Investment Spending Alignment; and
- **Workstream 4:** Spatial Development Accountability.

Workstream 1: Championing and Support

This workstream pertains to the custodianship of the NSDF and the process of ensuring that the NSDF is being advanced and institutionalised within government and across society.

A dedicated **Spatial Transformation Unit** in national government with the necessary resources and authority will be responsible for the following:

Embedding the NSDF in government and across society:

- Championing and guiding NSDF implementation;
- Undertaking broad-based communication of the NSDF to build shared understanding;
- Institutionalisation of the NSDF into Centre of Government Planning, Budgeting, Implementation, Monitoring and Evaluation Systems;

- Undertaking ongoing spatial development observation and research;
- Embedding collaborative planning and action ;
- Undertaking ongoing engagement spatial development norms, standards and differentiated guidelines for different integrated, inclusive and sustainable settlement formations;
- Providing technical support to departments, provinces, and municipalities in interpreting and applying the NSDF Frames and guidelines; and
- Reviewing and updating the NSDF.

Engaging in review of policy and fiscal tools and instruments that support and incentivize spatial transformation:

- Evaluating performance of fiscal instruments in relation to spatial transformation outcomes;
- Reviewing investment requirements, fiscal capacity, funding and financing strategies;
- Reviewing infrastructure and human settlement grant funding mechanisms;
- Undertaking socio-economic cost-benefit modelling; and
- Making recommendations with regard to the establishment of any special Spatial Funds.

Supporting coordination of spatial transformation and national priority actions:

- The NSDF will apply all at once across the country where the different role players have to exercise their mandates and perform their functions according to the spatial guidance and direction detailed in the NSDF Sub-Frames. There will have to be a focus on national priority issues and actions, i.e. the NSAAs, and these will be supported at a central coordinating level in a focused and phased manner;
- The Spatial Transformation Unit could sequence and support intensive focus and coordination of national sector strategies and plans in each urban and rural region and corridor for defined periods until all regions are spatially transformed between now and 2050; and
- Similarly, in alignment with the NSDF and in coordination with the national spatial transformation unit, each Province will prepare or refine/adapt their PSDF and will undertake coordination at provincial level, to identify and sequence focal areas within the province.

Workstream 2: Development Planning Alignment

This workstream entails the process by which sector departments, provinces and municipalities prepare their sector strategies, spatial and development plans. These plans have to be reviewed and aligned with the NSDF.

Each national department, state entity, province and municipality already has a mandate and set of responsibilities in terms of planning, implementation and spatial governance. These roles will continue, but they will now have to be undertaken in adherence with the NSDF.

The priority for each role player will be:

- National sector departments have to prepare or review their sector strategies as long-term plans that respond/align to the broader development goals and objectives set out in the NDP and the spatial development objectives and outcomes set out in the NSDF;
- The key priority sector issues and strategies will have to focus on:
    - Long-term water security for all, according to the desired future national spatial development pattern;

- Energy security for all according to the desired future national spatial development pattern;
- The provision of social services (schools, clinics, hospitals, community centres, sports fields, etc) to meet growth demands and according to the desired future spatial development pattern;
- Protection of high value agricultural land, surface water and biodiversity areas;
- Providing guidance as to where future settlement growth may take place, according to the desired future national spatial development pattern, and limiting the footprint of land development and human settlement in the process;
- Developing economic development strategy, highlighting the role, potential, opportunities and unique selling points across different places;
- The justification, spatial impacts and place-making logics of new economic nodes (SEZs, mines, industrial parks, commercial hubs) and economic infrastructure investment including roads, ports, rail, and telecommunications;
- Rehabilitation of mining land in declining mining areas and diversification of local economies;
- Guiding and resolving conflicting land uses according to the NSDF guidelines and by undertaking research and obtaining independent inputs and recommendations;
- Initiating well-considered rural development strategies and rural economic diversification and industrialization; and
- Working together with traditional leaders, preparing a framework for, and ensuring agreement on undertaking settlement planning and unlocking land development in areas under traditional authority control.

- Provinces have to:
  - Prepare or review their PGDSs and PSDFs and align these with the NSDF;
  - Coordinate the alignment of provincial sector and municipal plans and demonstrate how this alignment is contributing to the adherence of the NSDF; and
  - Change provincial spending patterns according to desired spatial impact, especially human settlement subsidies.
- Similarly, municipalities have to:
  - Prepare or review their IDPs and SDFs for their area of jurisdiction according to the spatial guidance and direction provided in the NSDF, and in alignment with the respective province; and
  - Conduct spatial governance, undertake their spatial planning and land use management functions, more rigorously and in strict adherence with spatial transformation and inclusive place-making objectives as outlined in the NSDF.
- The private sector has to:
  - Undertake investment and prepare development applications in accordance with the NSDF spatial guidance; and
  - Adhere to the SDF of the respective municipalities, and not undermine municipalities and/or act in any manner that compromises the shift to an efficient and inclusive spatial forms.

Workstream 3: Investment Spending Alignment

This workstream entails the process by which departments, state entities, provinces and municipalities undertake their budgeting and implementation processes. These processes have to be aligned to the NSDF.

National Treasury (NT) will have to consider the alignment with the NSDF in the allocation and approval of budgets. A joint committee between the Spatial Transformation Unit and NT will consider infrastructure investment spending proposals and large-scale projects will have to undergo spatial impact assessment prior to any approvals.

Workstream 4: National Spatial Development Accountability

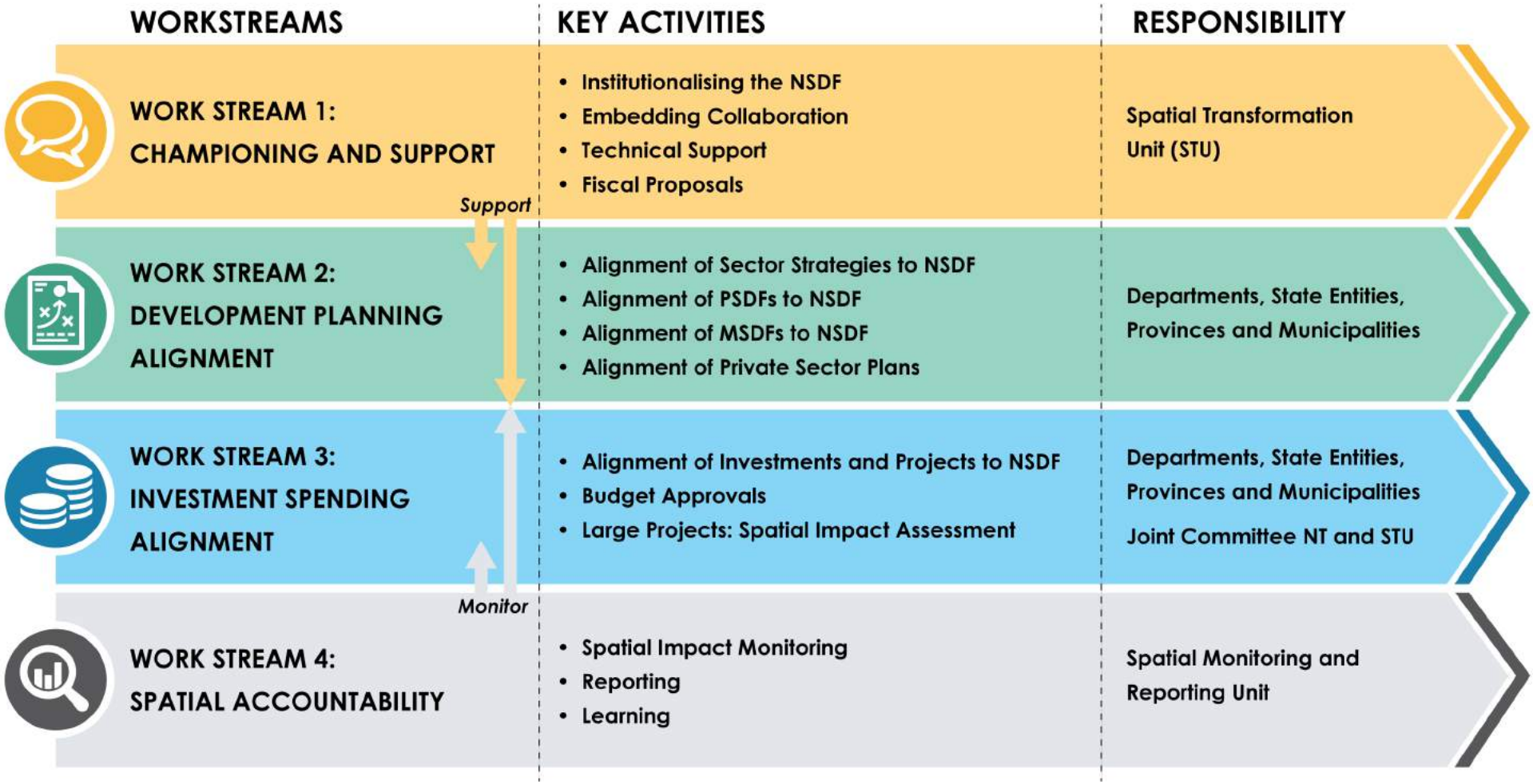
A special spatial impact monitoring and reporting unit will be established to set up and operate a national spatial accountability system. This will entail coordinating the reporting by the various departments, state entities, provinces, municipalities and private sector in relation to adherence to the spatial guidance and direction set out in the NSDF and in relation to the performance of their own functions and performance against any specific/relevant actions identified in the NSDF.

Whereas in the past, role players were not sufficiently held to account for the spatial impact of their planning, investing and delivery processes, now each of the role players including private sector as part of the *national spatial accountability system* will be more rigorously engaged and will be obligated to report on how they are adhering/contributing or not through the performance of their own functions to the desired spatial development patterns and outcomes.

The unit will establish criteria based on the NSDF Frames in assessing the planning and investment of role players and will prepare and submit reports on annual basis to cabinet to identify gaps and make proposals on improving alignment and adherence to the NSDF.

Workstream 1 will oversee and provide support for the alignment processes undertaken in workstreams 2 and 3. Workstream 4 will monitor the alignment and impacts of work undertaken in workstreams 2 and 3 (see **Figure 66**).

Figure 66: Workstream Overview



6.4 Rolling out the NSDF

For the NSDF vision and goals to be achieved, along with the desired national spatial transformation, there are enabling activities, institutional mechanisms and capability enhancements that need to be considered for the national planning system to operate. As argued in a recent DPME report, *"The imperative for institutionalisation is derived from identified gaps and the need to build the planning system by introducing a stronger and explicit developmental focus. In this context, institutionalisation means developing and strengthening the institutional, technical and administrative foundations (capacities, systems and processes) for a coordinated and responsive state that would be effective in promoting the structural changes required for inclusive growth, developing the country's human resource base and a stronger democracy".*[xx] Capability enhancements to the spatial planning system include building spatial literacy within government and enhancing the coordination and alignment roles traditionally played by spatial planners in intergovernmental systems.

Given that the capability of the state is a key enabler of effective planning, governance and implementation, the implementation of the NSDF (1) is intrinsically tied to government's institutional, organisational and individual capabilities, and (2) rests on two interrelated components:

- The use and application of the NSDF to guide action and spatial investment; and
- The building of 'national spatial planning and transformation capability' to undertake, manage and develop the benefits of spatial planning at an institutional, organisational and individual level within government and more broadly, across society.

The promulgation of *SPLUMA* has clarified the role of spatial planning and land-use management. At the same time, the systems and frameworks for intergovernmental planning and budgeting are being institutionalised and improved. Implementation, like planning, is, however, not a once-off step. In the case of the NSDF, it is also a continuous process of mobilising resources and action, guided by the objectives and desired outcomes of the NDP. Improvements and refinements are also made through monitoring and review, to (1) improve approaches and understandings, and (2) overcome obstacles on a continuous basis.

The NSDF has identified **five areas** for action that need to be considered. These consist of *three* **enabling components** and *two* **change and transformation-driving components**.

The *three* **enabling components** are:

- A *championing capability,* with associated programmes for building spatial transformation capability and supporting behaviour change;
- Supporting the *'centre of government' institutions* in improving developmental outcomes through the system of planning, budgeting, implementation, monitoring and evaluation; and
- Guiding the *alignment and coordination* of investment spending and planning capacity development, both (1) within government spheres and sectors, and (2) through broader private sector, civil society and learning organisation support and involvement.

The *two* **change and transformation-driving components** are:

- Communicating and sharing the NSDF, to ensure that it is broadly understood, and its use is enabled; and

- Specific and priority spatially targeted initiatives that (1) are of national significance, and (2) draw from the core components of the NSDF, as set out in **Part Five**

The *five* **action areas** would, taken as a whole, enable *the NSDF* and *national spatial planning* to be:

- *Championed:* National spatial planning is championed, researched and continually refined and developed, and national spatial planning capability and support systems are built across society, to ensure the desired national spatial development patterns and outcomes;
- *Communicated:* The NSDF is broadly shared to ensure awareness and buy-in across society;
- *Institutionalised in centre of government systems:* National spatial planning (1) supports and responds to the developmental agenda of the state, as articulated in the NDP, and (2) is articulated through key national planning, budgeting, implementation, monitoring and evaluation systems;
- *Embedded:* The NSDF is well-understood and actors can (1) respond to it, and (2) utilize it to guide and coordinate investment to transform space through provincial, regional and municipal SDFs and sector plans; and
- *Actioned:* Strategic spatial initiatives and priorities within the NSDF are acted upon and implemented (1) in a systemic way, and (2) by appropriate champions and role-players who have a direct mandate relating to each priority.

Each of these aspects is discussed in more detail below:

6.4.1 Objective One: Championing and Guiding NSDF Implementation

A key capability is a national institutional home for spatial planning and spatial transformation. As a matter of urgency there is a need to resolve the issue of '*the home of spatial planning nationally*'. Consideration should also be given to establishing a dedicated '*unit*', staffed with the necessary technical and administrative expertise. The aim of this *Unit* would be to:

- Provide *advice and guidance* on how to maximise spatial impacts and transformation across government;
- Actively *coordinate* across government for better spatial outcomes;
- Report on *implementation* of the NSDF, and the extent to which outcomes are achieved; and
- Build spatial literacy within government and strengthen the capacity and capability of planners and the spatial planning system.

Three functions would be important, amongst others. *First,* to work across government to align spatial action to the NSDF and support spatial transformation more broadly. This would be both at the strategic levels of the MTSP/MTSF and MTEF and other associated centre of government coordinating mechanisms and through national sector, provincial and local planning. *Second,* to champion research into, and around spatial planning and improving its utility to government. This could include working with learning organisations, civil society and other bodies to improve spatial planning capability. *Third, to,* through a consultative process, develop a framework for monitoring and evaluating the efficacy and realisation of spatial transformation, and in particular focusing on the priority actions associated with the NSDF frames.

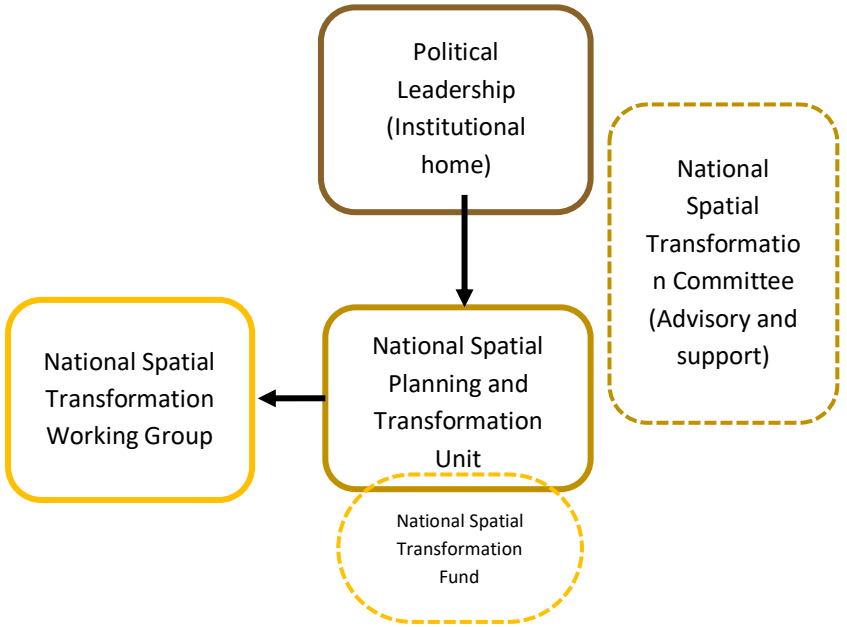
To facilitate this role, it is proposed that consideration be given to establishing two supporting structures. Firstly, a '*National Spatial*

Transformation Working Group' chaired by a/the lead spatial planning department. The aim of this working group would be to coordinate national action around spatial transformation. Second, a *'National Spatial Transformation Committee'*. This advisory and support committee should comprise representatives of the three spheres of government, the private sector, academia and professional bodies. Although drawing on the NSDF, this committee would have a broader focus and be composed with the aim of informing the spatial transformation agenda of government and society. Given the important role of evidence, monitoring and knowledge-sharing, this capacity needs to be enabled. As such, it could also guide the building and deepening of 'spatial literacy' and spatial planning capabilities amongst the built environment professions and within government.

The detailed terms of reference for the proposed *Unit, Working Group* and *Committee* would have to be developed while taking cognisance of existing structures and current processes, to avoid duplication and to ensure alignment, e.g. with the *IUDF Working Group*.

A priority for the proposed Unit, should be to engage in discussions with National Treasury on the development of a fund under the jurisdiction of the Unit to support transformation objectives. The scope of the fund would need to be developed in consultation, but aspects could include those relating to supporting spatial transformation initiatives of national significance (especially around coordination and alignment in space and time), spatial planning and transformation

Figure 67: Championing of Spatial Transformation



6.4.2 Objective Two: Communication of Shared Action

Communication is an essential and often neglected aspect of implementation. It is also a cost-effective way of building understanding and shared action. People and institutions can only act on, and invest in, a plan they know and understand. An effective communication strategy

that targets all spheres of government, the private sector, academia and civil society will have to be put into place. The proposed *Spatial Transformation Unit* should be tasked with developing and implementing this, and the requisite funding provided.

This communications strategy would need to work across a range of platforms. Consideration should be given to professional communications support, to develop and, as and where necessary, implement certain components of the communications strategy. Two key components should be included in such a strategy:

- A strong web-presence and profiling on key government websites, and in particular, '*centre of government departments*'[xxi], which includes The Presidency, DPME, CoGTA, DRDLR, and NT; and
- The use of existing inter-governmental engagement platforms to profile and explain the NSDF, including key government partners, such as SALGA, who would be a crucial ally in introducing and communicating the NSDF to municipalities.

6.4.3 Objective Three: Institutionalisation of the NSDF into Centre of Government Planning, Budgeting, Implementation, Monitoring and Evaluation System

Consideration needs to be given as to how the NSDF will link to the broader systems of planning, budgeting, implementation, monitoring and evaluation in government. This includes discussion as to how the NSDF could, amongst others:

- Support and strengthen the proposed Medium-Term Strategic Plan (MTSP) and the Medium Term Strategic Framework (MTSF);
- Inform and help strengthen the '*Budget Mandate Paper*';
- Improve alignment of sector and sphere budgeting, especially as related to spatially-targeted capital spending (and long-term infrastructure spending in particular);
- Contribute, through its implementation processes, to capacity building that impacts and supports spatial transformation; and
- Assist in identifying where special grants or other funding mechanisms could be considered to support spatial targeting, regional planning and other programmes aimed at spatial transformation

Figure 68: Clear Line of Sight

Suggestions for discussion include:

DPME
• DPME utilizes the NSDF to provide the spatial lens to the Medium-Term Strategic Plan (MTSP). • In line with the above, the DPME utilizes the NSDF as the spatial representation of the Mandate Paper (annually) prioritization and the MTSF (five-year cycle). • That DPME monitors the alignment of sector budget spending in physical space in line with the NSDF.

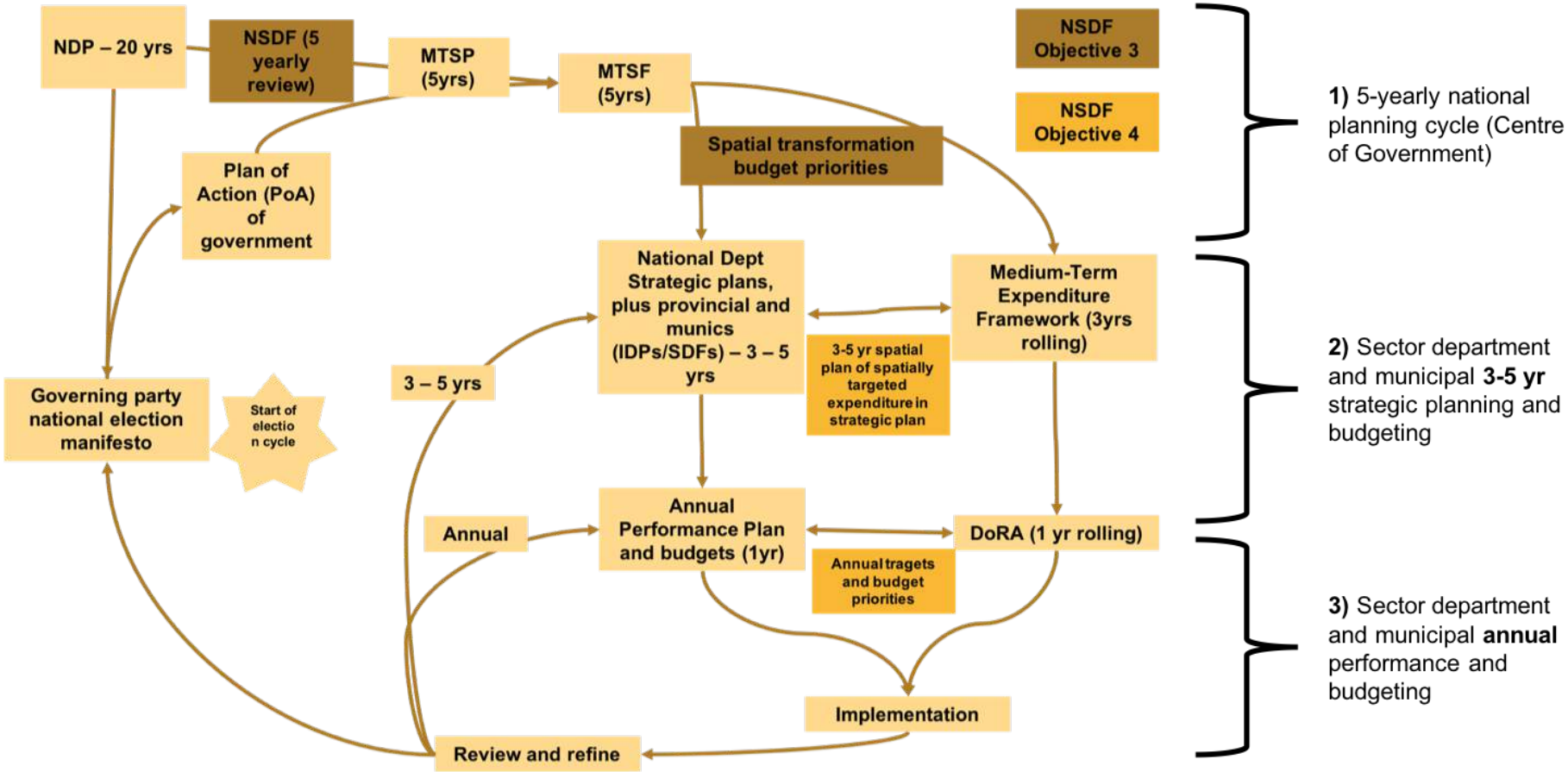
National Treasury
• In recognising the role of the NSDF in coordinating spending in space, NT could consider ways to use it to guide national sector department budgets (especially long- term infrastructure) and check that programmes align to and reinforce the objectives of the NSDF. • That this spending and prioritization is monitored and reported on.

COGTA
• That CoGTA supports the developmental, place-based and regional approach of the NSDF through capability- building and other related initiatives. This approach could take the form of regional intervention starting with PGDSs and PSDFs (and possibly associated RSDFs).

DRDLR
• That DRDLR (or the department responsible for spatial planning) establish a well-resourced and capacitated Spatial Planning Support Agency (or similar) that sees to, and if necessary, funds the placement of accredited spatial planners in every municipality. • That DRDLR (or the department responsible for spatial planning) considers how to empower planners and support them in building and enabling cross-sphere alignment with spatial planning.

Figure 69 below illustrates conceptually the interface of the NSDF with the national system of planning, budgeting, implementation and monitoring as discussed above and in the following section. Milestones of the implementation and monitoring system are as follows:

Figure 69: National Role in System of Planning, Budgeting, Implementation and Monitoring



1.) Five-year national planning cycle: After a national election a five-year plan of action is developed. Given the status of the NDP, this draws from the NDP, a shared plan. This plan is used to inform the MTSF of government as a whole. The NSDF is aligned to the NDP and is likewise reviewed every five years. It must also find expression in the MTSP. Annually the Mandate Paper identifies key priorities, likewise, there should be spatial investment priorities identified drawing on the MTSP.

2.) Three-to-five-year actions: Taking their cue from the MTSF and NDP, sector departments and municipalities formulate their strategic plans (three-five years) and National Treasury developments the budget and MTEF to the same logic. National sector departments and municipalities must then utilise the NSDF to develop their own spatial depiction of their strategic plans and link these to their budgets (the spatial investment components).

3.) Annual actions: Annual performance plans and budgets then need to set targets for each against the long-term strategic plan.

6.4.4 Objective Four: Embedding Implementation and Collaborative Action

All government departments preparing sector plans need to consider their spatial impact, especially as related to capital and infrastructure spending, and such plans must be aligned with the spatial priorities outlined in the NSDF. The aim is to achieve crucial urban, rural, municipal, provincial, regional and national development goals and objectives. This discussion needs to be focused on the procedures to facilitate and promote cooperative government and intergovernmental relations in respect of spatial development planning.

This aspect needs to explore the way in which this is done through:

- National sector departments;
- Provincial government plans;
- Municipal planning;
- Sub-national or regional planning;
- The private sector;
- Civil society; and
- Learning organisations.

Suggestions for discussion include:

National and Provincial Sector Departments	It is suggested that national sector departments and their provincial counterparts add a spatial component to their strategic plans that (1) is aligned to the NSDF, and (2) depicts the location of their spending, especially those components with a specific spatial and/or capital/infrastructure expenditure component. In doing so, they should also indicate how they will engage with the unique attributes of the places where the investment will 'land' in a sub-national space in such manner that it (1) responds to the unique regional and local challenges (as articulated in the IDP and SDFs), and (2) supports regional and local development in the area concerned.  When new national policy or legislation is contemplated, a Socio-Economic Impact Assessment System (SEAIS) is required. The suggestion is that an indicative *capital expenditure* ***spatial*** *framework* be incorporated as part of the Socio-Economic Impact Assessment System (SEAIS).
Provincial Government	That Provincial Governments explore practical ways of utilizing the NSDF as an important contextual frame for the preparation of their PGDSs and PSDFs.
Regional Development Collaborators	The NSDF could identify, make use of and coordinate relevant regional collaboration, and/or spatial development planning initiatives. Recent examples are the Nama Karoo and the Northern Free-State Regional Initiatives, and associated RSDF processes.
Local Government	That consideration be given by municipalities to practically using the NSDF as a 'crucial frame' in the preparation and review of their IDPs and SDFs, and any other form of long-term strategic planning.
Citizens and Civil Society Organisations & the Private Sector	That citizens, civil society organisations and the private sector are encouraged to engage proactively and on a continuous base with the NSDF, to ensure that their investment and spending decisions (1) respond to, and support national, regional and local needs, and (2) actively contribute to national spatial transformation and inclusive economic growth.
Learning Institutions and the	Capacity building on national (1) trends, dynamics, challenges and opportunities, (2) sense-making, and (3) spatial development concepts and plans is important. Learning institutions are encouraged to

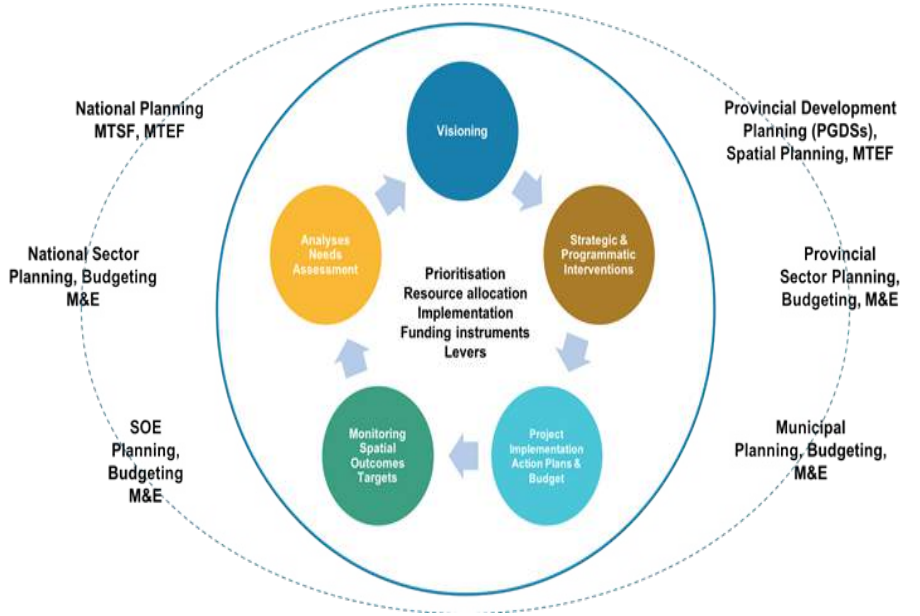
Planning Profession	follow, analyse and constructively critique the implementation of the NSDF with a view to offering reflections and insights on how it might be improved and/or refined when it is next reviewed.
Research Institutions and Initiatives	Ongoing research on national spatial development and inter-regional dynamics and spatial development scenarios is imperative. These entities are ideally placed to initiate and undertake and sustain such research.

6.4.5 *Objective Five: Sector Specific and Spatially Targeted Priorities Actioned*

This objective is the most important for spatial transformation. All the preceding objectives ultimately need to focus on the sector specific and spatially-targeted priorities identified in the NSDF's Frame and Sub-Frames.

The NSDF seeks to support *improved investment impact* and *alignment* of (1) national integrated and sector plans, and (2) provincial and regional plans and strategies within the context of government's five-year planning and review cycle and process. As indicated in **Figure 70** below, this it does by (1) being *informed,* and taking its cue from the NDP and a myriad of other multi-term, multi-sector, multi-sphere spatial-decision-making processes and plans, frameworks, strategies and programmes, and in turn (2) *guiding* many of these, and a range of other such plans, frameworks, strategies and programmes when they are being prepared, implemented and/or reviewed.

Figure 70: The Envisaged Role of the NSDF in Plan Preparation, Budgeting, Implementation and Review Cycles in Government



The envisaged role of the National Spatial Development Frame and Sub-Frames in the spatial alignment of Government's planning instruments and cycles is set out in **Figure 71.**

Figure 71: The Envisaged Role of the National Spatial Development Frame, Sub-Frames and Strategic Spatial Action Areas in Spatial Planning

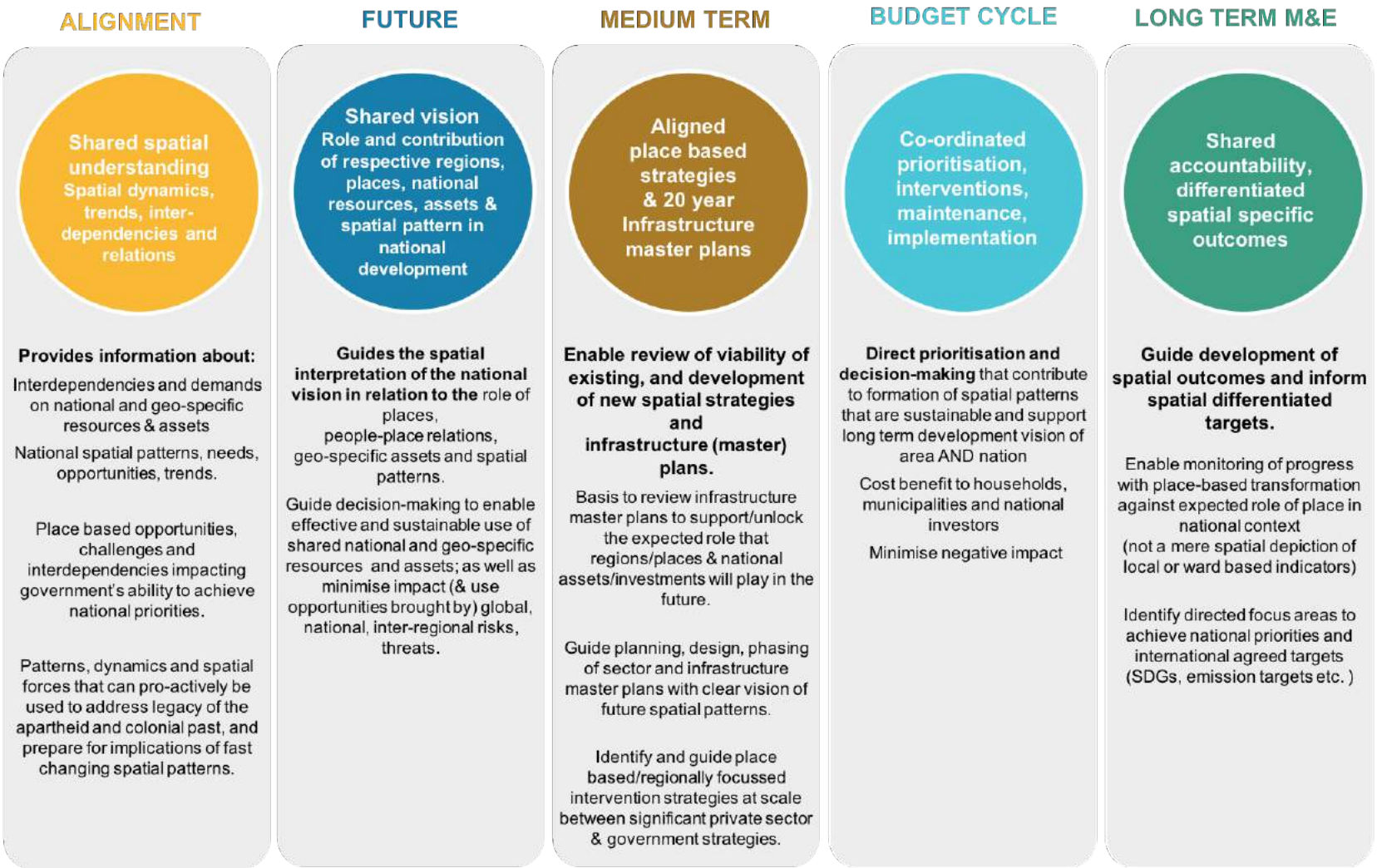
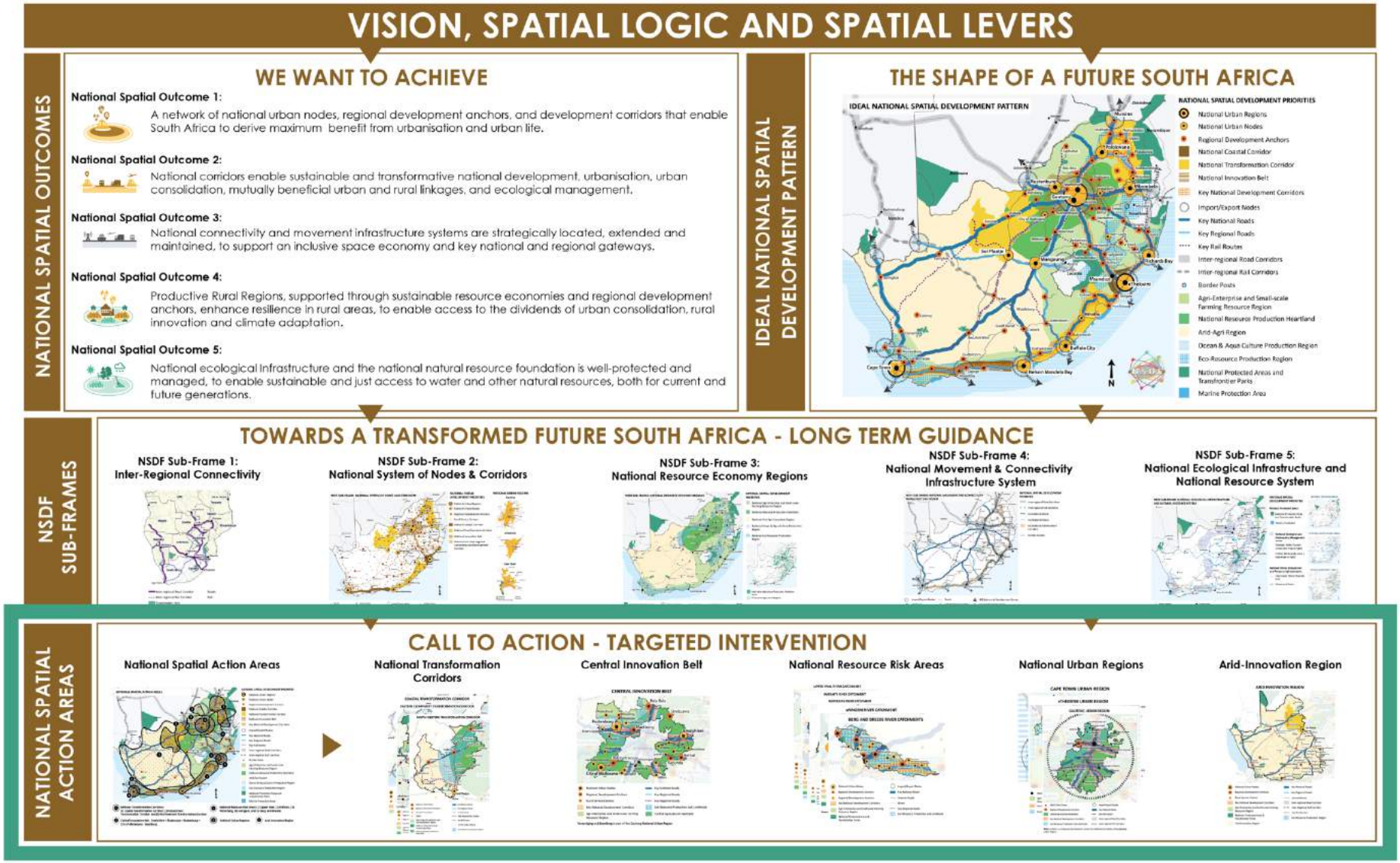


Figure 72: Priority National Spatial Action Areas



6.5 Implementation Planning

The NSDF has two key *target dates*:

- **2030:** In alignment with the NDP; and
- **2050:** In recognition of (1) the long-term infrastructural, and (2) other investments required over time to completely transform our society and country from colonialism and Apartheid to a truly democratic Post-Apartheid society.

Implementation of the NSDF has three 'cycles':

Cycle 1: Initiation 2019 to 2023

- Within this cycle the focus is on alignment of long-term plans, vision and shared understanding.
- This is achieved through building the championing capability and ensuring broad communication and awareness.
- The key targets for this phase include:
  - Establishment of a championing capability that is well resourced and enabled (measured by establishment of institutional capacity with this mandate);
  - Raising awareness of the NSDF and its implications across all three spheres of government, learning organisations, civil society and private sector (measured by acknowledgement in the MTSP/MTSF and MTEF and use of and reference to the NSDF vision in alignment of national sector plans, PGDSs and municipal SDFs/IDPs); and
  - Responding to the call for action regarding the NSAAs in Part 5, and planning for and embarking on decisive action in accordance with the guidance provided.

Cycle 2: Alignment, budgeting and execution 2024 to 2043

- Here the focus is on alignment of spatial strategy and medium-term plans.
- Strengthening and deepening of action in accordance with the provisions of the NSAAs is now well under way, and in some cases, notably the NSAAs relating to the environment, the objectives with regards to stabilisation, preservation, protection and management of fragile ecosystems have been realised.
- This cycle is broken up into four five-year cycles corresponding with the five-year government planning cycles. In this phase the aim is to build on the foundation laid in the initiation phase.
- In the first five-year cycle (2024 to 2028), the main focus would be on Institutionalisation of the NSDF and embedding the NSDF in national, provincial and municipal planning. The key targets in this phase include:
  - Use of the NSDF in the MTSP/MTSF and MTEF, and other centre of government planning, budgeting and implementation tools (measured by the use of the NSDF in guiding priority actions at a national level to align and guide spatially targeted investment); and
  - Use of the NSDF in the Sector Plans, PGDSs and SDFs/IDP to enable greater cross-country coherence, whilst still respecting provincial and local contexts and challenges (measured by use of and reference to the NSDF).
- In the next three five-year cycles, the aim is to see a refinement and deepening of the institutionalisation and embedding, but with greater emphasis being placed on the execution of the spatial priorities identified in the NSDF Spatial Frames (measured by project progress on priorities and budget allocations).

Cycle 3: Renew and re-do 2044 to 2049

- In the last five-year cycle, it would be expected of implementation to continue, but for a full evaluation to be undertaken and the preparation for the compilation of the next NSDF to begin.

The Implementation Cycles are shown in **Figure 73** below, and the shifting focus of NSDF implementation over time is shown in **Figure 74** on the following page.

Figure 73: NSDF Implementation Cycles

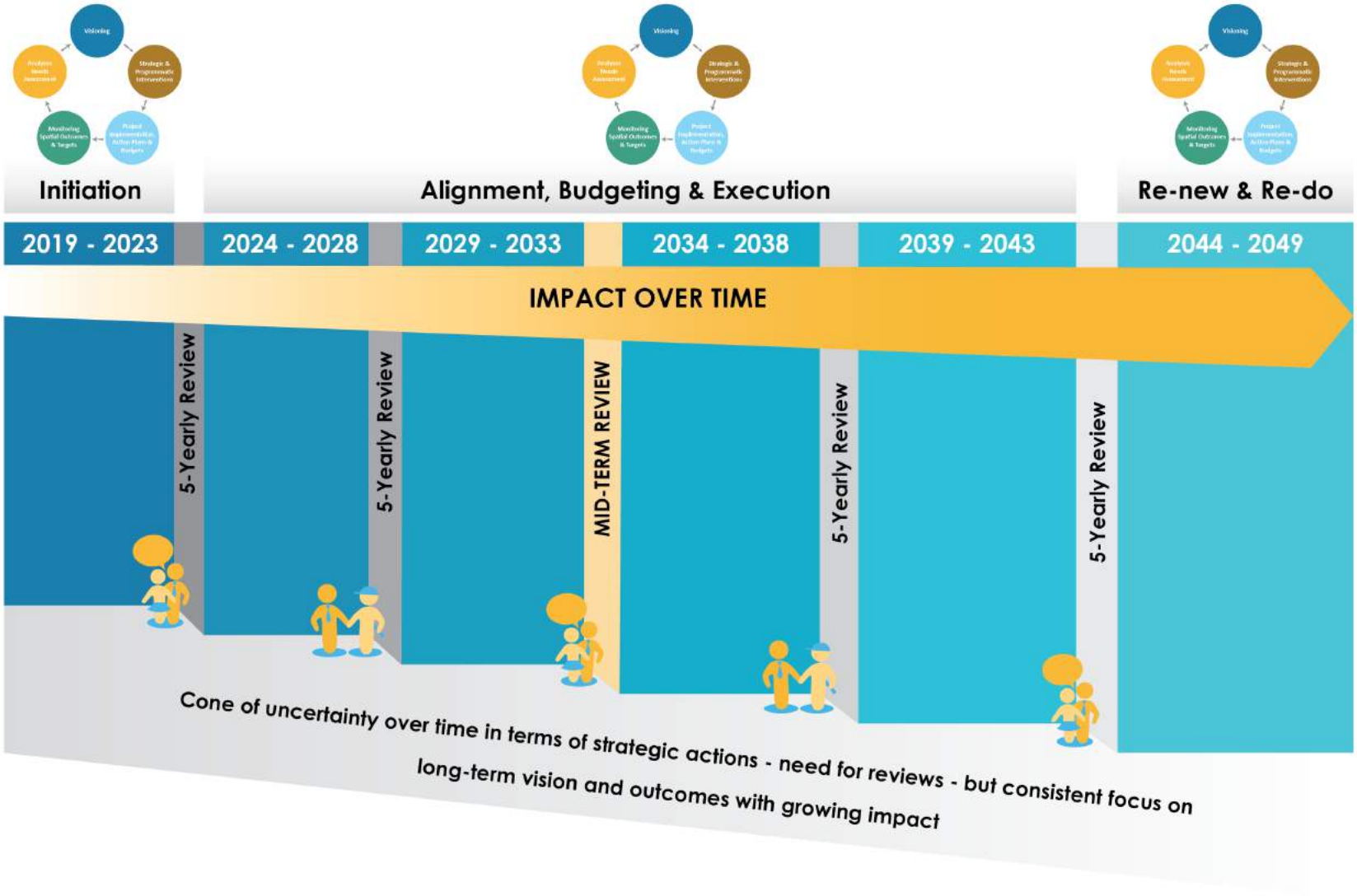
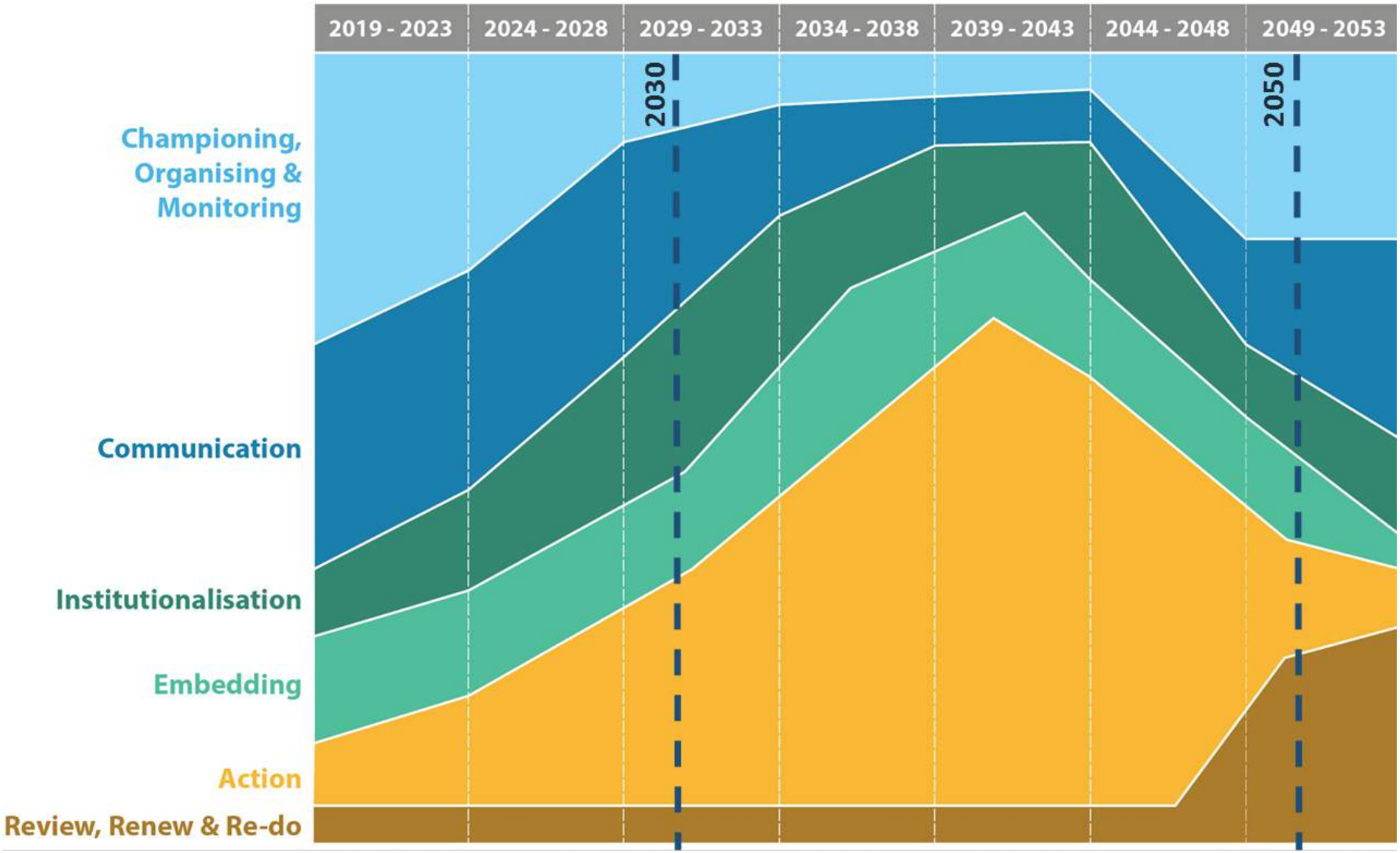


Figure 74: NSDF Implementation Cycles Overview

Figure 75: NSDF Implementation – Level of Focus over Time



6.6 NSDF Review

As indicated in **Section 6.2**, the NSDF takes a long-term view with both a 2030-horizon and a 2050-horizon. However, reality dictates that there will many changes and impacts over the course of this period which cannot be foreseen. The five-yearly reviews, in accordance with SPLUMA, are sure to result in shifts in the Frame, Sub-Frames, desired National Spatial Outcomes and Priority Actions. It is, however, expected that the key transformative elements of the Vision and Logic will hold true, and continue to guide action

6.7 Monitoring and Evaluation

The regular process of five-yearly review, along with a mid-term review of the NSDF and its impacts, will require a monitoring and evaluation framework to be developed. Some indication has already been given as to the broad indicators and measurement of the NSDF. However, this monitoring and review framework needs to specifically address the achievement of the NSDF transformational changes and impacts. This will need to be an important focus of the championing agent in the initiation phase. The development of the framework is also an opportunity to contribute to deepening the understanding of the NSDF and its intended outcomes. It should thus be used as an opportunity to (1) engage the three spheres of government and other civil society, learning and private sector bodies, and (2) continue the discussions started *in* and *through* the compilation of the NSDF.

This broad overall monitoring will work in tandem with the national spatial accountability system under Workstream 4.

PART SEVEN: Conclusion

This Draft NSDF highlighted the persistence of colonial and apartheid spatial patterns and their detrimental impact on the ability of government to meet its national development objectives of reducing poverty, inequality and unemployment. To rid the country of this stubborn historical spatial stranglehold, a theory of change was developed that relies on, and proposes radical and decisive intervention in the national:

- Spatial development logic and pattern;
- Natural resource use and maintenance profile; and
- Patterns of ownership of, and access to, land and other resources.

The desired national spatial development vision, logic, and pattern, as put forward in the NSDF hold out the real promise of a very different South Africa by 2050. While providing overarching national spatial direction, catalytic impetus and guidance in moving the country towards the 2050-vision, the realisation of this desired South Africa will require of the NSDF to be:

- Championed;
- Communicated;
- Institutionalised;
- Embedded; and
- Actioned.

These five actions demand equally radical and decisive change in the way investment and spending is planned, budgeted for and done in the national space. While these changes will not always be easy, and entail very different ways of engaging, collaborating and acting, the rewards of doing so will far outweigh the sacrifices – *a peaceful, prosperous and truly transformed South Africa by 2050!*

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- National Climate Change Adaptation Strategy

Location Specific Investment Infrastructure (Map of Current)

- Strategic National South African Infrastructure network and plans, including: Strategic freight, heavy haul and passenger railway networks, Road network, Ports,
- Industrial Development Zones
- Special Economic Zones,
- ESKOM, 2017. Hydro Electricity, hydro-electricity, biomass electricity and co-generation electricity, and coal fired power generation sites
- Ports Regulator of South Africa (PRSA). 2015. South African port capacity and utilisation report 2015/16. Accessed 06 July 2016 at www.portsregulator.org.

Significant environmental protection areas:

- Nine World Heritage Sites - http://whc.unesco.org/en/statesparties/za
- Nineteen National Parks - https://www.sanparks.org/
- Strategic Water Source Areas - https://www.csir.co.za/strategic-water-source-areas-combining-surface-and-groundwater-enhance-water-security
- National Freshwater Ecosystem Priority Areas – http://bgis.sanbi.org/nfepa/project.asp

- Coastal Protection Zones – 100m from the high-water mark in Urban, 1000m in non-urban. - https://www.environment.gov.za/sites/default/files/docs/guideto_icm_act.pdf
- Wetlands of International Importance in SA (Ramsar sites) - http://www.saramsar.com/p/possibly-most-important-factor-in.html
- High Water Mark - https://www.environment.gov.za/sites/default/files/docs/guideto_icm_act.pdf
- Twelve Proclaimed Fishing Harbours - http://arnistonalive.org.za/wp-content/uploads/2013/10/Arniston-Harbour.pdf

National Government Spatial Specific Investment Initiatives

- Strategic Infrastructure Investment Projects (SIPS)
- Integrated Urban Development Framework Implementation: 37 Intermediary City Municipalities
- Department of Human Settlements Spatial Master Plan (guiding land release and investment through the Housing Development Agency)
- Renewable Energy Development Zones - as identified investment areas for renewable energy resource investment.
- PAKISHA's: Aqua culture and Ocean's Economy
- City Support Programme & BEPPs: Grant alignment and incentivisation
- Significant programmes, principles, policies or projects relating to environment:
  - Grasslands Programme (SANBI) - https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/grasslands-programme
  - Freshwater Programme (SANBI) - https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/freshwater-programme
  - Succulent Karoo Programme (SANBI) - https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/succulent-karoo-programme
  - Ecological Infrastructure (SANBI). - https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/ecological-infrastructure
  - CAPE Programme (SANBI) conservation of the Cape Floristic Region - https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/fynbos-programme

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- Department of Environmental Affairs (DEA). n/d. About the green economy. [Online] available at: https://www.environment.gov.za/projectsprogrammes/greeneconomy/about.
- Renewable Energy Independent Power Producer Procurement Programme (REIPPP) - http://www.energyintelligence.co.za/reippp-all-you-need-to-know/
- Renewable Energy Development Zones (REDZ) - https://egis.environment.gov.za/renewable_energy
- Local Action for Biodiversity: Wetlands South Africa – http://biodiversityadvisor.sanbi.org/wp-content/uploads/2016/07/LAB-Wetlands-SA-brochure.pdf
- Important Bird Areas - http://www.birdlife.org.za/conservation/important-bird-areas/iba-map
- Atlas of Freshwater Ecosystem Priority Areas in South Africa (Nel et al, 2011).
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- Report of the High-Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change. (2017). Page 32.

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- KwaZulu-Natal, Provincial Growth & Development Strategy, 2016
- Eastern Cape, Provincial Spatial Development Plan, 2010
- Free State, Provincial Spatial Development Framework, 2014
- Gauteng, Provincial Spatial Development Framework, 2017
- Limpopo, Provincial Spatial Development Framework, 2016
- Mpumalanga, Provincial Spatial Development Framework, 2013
- Northern Cape, Provincial Spatial Development Framework, 2012
- North West, Provincial Spatial Development Framework, 2016
- Western Cape, Provincial Spatial Development Framework, 2014

NSDF Diagnostic Reports

- Kena Consult PTY Ltd. 2016. Thematic Area Report Towards the Development of The NSDF — Theme 5: Movement and Transport. Kena Consult PTY Ltd Prepared for DRDLR.

- Kena Consult PTY Ltd. 2016. Towards A National Spatial Development Framework: Theme 2: Research on Human Settlements, Land Restitution and Land Tenure. 2016. Kena Consult PTY Ltd Prepared for DRDLR.
- Verna Nel, Busani Moyo, Stuart Denoon-Stevens, Maartin Friedrich. 2016. Spatial Economy. Kena Consult PTY Ltd Prepared for DRDLR.
- Gaynor Paradza. 2016. Research Report: Social Infrastructure. Kena Consult PTY Ltd Prepared for DRDLR.

Figure Reference and Resource List

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
Figure 1	**National Transformation Logic**		NSDF technical team work	NSDF - EUP technical team, 2018
Figure 2	**The NDPs proposed National Schema for Spatial Targeting**		Published NDP document	National Planning Commission. 2011. National Development Plan: Vision for 2030. Pretoria. NPC.
Figure 3	**The Role of the NSDF within the 'Family" of Strategic and Sector Plans of Government**		NSDF technical team work	NSDF - EUP technical team, 2018
Figure 4	**Document Structure**		NSDF technical team work	NSDF - EUP technical team, 2018
Figure 5	**NSDF Preparation Process**		NSDF technical team work	NSDF - EUP technical team, 2018
Figure 6	**NSDF 2018 Development and building blocks to support impact and alignment**	Policies, strategies, frameworks, plans, Reports	Constructed graphically by NSDF technical team. Constructed from various reports reflected in bibliography.	NSDF - EUP technical team, 2018
Figure 7	**People and Places- Population and Settlement**		Population per Settlement Type. Calculated using the	Spatial data indicators based on StatsSA 2011 and Household Survey 2016

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
	Dynamics- Settlement Typology Distribution		CSIR Functional Town Typology, 2018. For more descriptive information on Mesoframe see the following link: http://stepsa.org/pdf/2018_CSIR_Town_Typology.pdf	Quantec, 2018 (https://www.quantec.co.za/)
Figure 8	**People and Places- Population and Growth Dynamics- Population Growth Spatial Representation 1996-2016**		Demographic Change using CSIR Town Typology, 2018. Population values presented as 3D value indicating growth for period 1996-2016. For more descriptive information on Mesoframe see the following link: http://stepsa.org/socio_econ.html For Typology: http://stepsa.org/pdf/2018_CSIR_Town_Typology.pdf	Spatial data indicators based on Quantec data containing annual time series adjusted data and reflected in the CSIR Town Typology, 2018.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
		Sparsely Settled Areas-Western and Central Region	Sparsely populated region with less than 10 people per square km, with scattered towns. Calculated using the CSIR Mesoframe 2017 and Functional Town Typology, 2018	CSIR Town typology, 2018
		Cities and towns	Calculated using the CSIR Mesoframe 2017 and Functional Town Typology, 2018	CSIR Town typology, 2018
		Dense Rural Settlements: Former homeland areas		CSIR Town typology, 2018
		Densely Settled Coastal Corridor		CSIR Town typology, 2018
Figure 9	**People and Places – Demographic Growth Scenarios 2050 Population (medium Scenario – Settlement Growth With No intervention)**	Estimated Population Growth	Demographic Modelling and Scenarios developed through the CSIR Green Book- project, 2018 using CSIR Town Typology, 2018. www.greenbook.csir.co.za The methodology applied in the Green Book project is listed in the story map sections see link: https://pta-gis-2-web1.csir.co.za/portal/apps/G	Le Roux, A., Arnold, K., Makhanya, S. & Mans, G. 2019. Green Book – South Africa's urban future. Growth projections for 2050. Pretoria: CSIR

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			BCascade/index.html?appid=5180459a765c4e63bfb3fa527c7302b3	
Figure 10	**People and Places – National Land Use- Productive Land**	Protected Areas	The South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) are GIS inventories of all protected and conservation areas in South Africa. The database includes data on privately owned protected and conservation areas. Sourced from https://egis.environment.gov.za/	Department of Environmental Affairs, 2018.
		Trans-frontier Parks	a Trans-frontier Park is an area comprising two areas, which border each other across international boundaries and whose primary focus is wildlife conservation.	Department of Environmental Affairs, 2018
		Mountains	CSIR Mesozone Land descriptions 2017	CSIR Town typology, 2018
		Hyper Arid Zones		CSIR Town typology, 2018
		Arid Zone		CSIR Town typology, 2018

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
		Productive Use: Urban and Rural Settlement area	http://stepsa.org/socio_econ.html Based on Department of Environmental Affairs. Sourced from https://egis.environment.gov.za/ Department of Agriculture , Used in NDP, 2011 -	CSIR Town typology, 2018
		Productive Use: Sparsely Populated areas		CSIR Town typology, 2018
Figure 11	**People and Places – Population Vulnerability – People in poverty**	Social Vulnerability	Vulnerability of households in terms of a range of indicators, based on a multi-criteria analyses including inter alia, household income levels, female and child headed households, child mortality.	Le Roux et al 2015 – See stepSA Indicators on Web site for fully reference and description http://stepsa.org/social_vulnerability.html
		The number of people living below minimum household income level is used as indication of people living in poverty	Low levels of household income or household poverty is an item often used to depict where households are that have a low standard of living and which are subsequently most in need of services and assistance	Based on StatsSA, 2011; Quantec 2014; Developed for DRDLR by CSIR – See DRDLR Project on stepSA http://stepsa.org/priority_rural_districts.html

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			Household poverty see: http://stepsa.org/household_poverty.html	
		Age distribution 0-14 years	Indication if the numbers of the population in the below 14 age category depicted from Mesozone data and displayed as circular graphics reflecting size.	CSIR Town typology, 2018
Figure 12	**Ecologies, Economies and Spaces – Climate Change and Projected Regional Implications**	Increase in temperature Decrease in Rainfall Increase in Rainfall Increase in rainfall events etc.	Provided through CSIR Green Book Project 2018 which undertook Climate Change Modelling based on scenarios See Annexure for brief description of analysis process.	The Green Book. 2019. Green Book: Adapting South African settlements to climate change. www.greenbook.csir.co.za
Figure 13	**Ecologies, Economies and Spaces – National Ecological Infrastructure**	Protected areas	The South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) are GIS inventories of all protected and conservation areas in South Africa. The database	Department of Environmental Affairs, 2018.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			includes data on privately owned protected and conservation areas. Sourced from https://egis.environment.gov.za/	
		Strategic water source production areas	Ground Water - Strategic water source for groundwater areas can be described as the country's most important water sources, because they supply a disproportionately high amount of the country's water in relation to their size Surface Water Areas - Strategic water source for surface water areas can be described as the country's most important water sources, because they supply a disproportionately high amount of the country's water in relation to their size Statistics calculated is based on land areas, transfers and	Natural Resources and Environment (NRE) Unit at CSIR and Water Research Commission(WRC), 2017. [Commissioned research project]

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			population from Mesoframe and CSIR Town Typology 2018.	
Figure 14	**Ecologies, Economies and Spaces – Ecological infrastructure , Interdependence and Threats**	Water security: Spatial Interdependencies	Analysis based on water production areas, transfer schemes and settlement typology. Sourced from reports and a spatial analysis of water transfers.	Manadala GIS. 2018. (https://mandalagis.com)
		Stressed Catchments	Stressed catchments- Water stress is when the amount of water used exceeds 10% of renewable resources	Department of Environmental Affairs, 2017
		Water Scarce Regions	Selection of arid areas receiving low rainfall. Extracted from Mesozone data.	CSIR Town Typology, 2018
Figure 15	**Ecologies, Economies and Spaces – Supporting Ecological Infrastructure** Food Security: Spatial Interdependencies and Critical Role of Dense Rural	High Potential Agricultural Land	Agriculture Land capability, determined by the collective effects of soil, terrain and climate features, shows the most intensive long-term use of land for rain-fed agriculture.	South Africa's Agricultural Geo-referenced Information System (AGIS), Dept. Agriculture.
		Climate Risk	Sketch mapping drawing from climate risk data sourced from the Green book project	The Green Book. 2019. Green Book: Adapting South African settlements to climate change. www.greenbook.csir.co.za

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
		Ocean Economy	Simplistic representation of SA coastal extent, economic are and linkages. For more information and detail see: https://www.environment.gov.za/projectsprogrammes/operationphakisa/oceanseconomy	Operation Phakisa – Ocean economy, 2017
		Dense Rural Area	CSIR Functional Town Area 2018 indicating dense rural settlement areas. These areas are subsequently highlighted.	CSIR Town Typology, 2018
		Land with Very high and High productive capacity Land with agricultural production capacity	Land capability data reflecting areas of land with highest land capability. Information sourced from AGIS.	Department of Agriculture - AGIS, 2015.
		Important water source areas	Drawing from Strategic water source production areas (described above)	Natural Resources and Environment (NRE) Unit at CSIR and Water Research Commission(WRC), 2017. [Commissioned research project]
Figure 16	**Ecologies, Economies and Spaces – Regional Economic Trends - Regional Economic Growth and Employment**	LM economic growth compared against national average (2001 - 2016) Employment calculated per Town	Town calculation CSIR Functional Town Area 2018 Total Employment presented for 2016	Based on StatsSA, 2011; and Quantec, 2016. (https://www.quantec.co.za/)

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
Figure 17	**Ecologies, Economies and Spaces – National Economic Production and Employment Trends**	Spatial representation of Economic Production in SA (2016)	Mesoframe 2017 see http://stepsa.org/socio_econ.html Intensity mapping using interpolation of Mesozone data 4 economic sectors GVA – 2016	StatsSA, 2011; Quantec 2016. CSIR Town Typology, 2018 (interpolated)
		National Economic Output and Employment Trends (Increasingly Nodal)	Mesoframe 2017 see http://stepsa.org/socio_econ.html Also used for the Integrated National Export Strategy (INES): "Export 2030"(The DTI)	StatsSA, 2011; Quantec, 2016. The DTI. 2016. Integrated National Export Strategy (Export 2030)
Figure 18	**Ecologies, Economies and Spaces – People and Agglomeration Economies in Polycentric Network of Cities and Town**	People and Service Economy. Government Services	Spatial Indicators based on Mesozone 2017 and CSIR Functional Town Area, 2018 Government services – reflected by SIC categories, values interpolated see also Figure 16. People economy also indicating places of large population agglomerations.	StatsSA, 2011; Quantec, 2016
Figure 19	**Ecologies, Economies and Spaces – Agriculture**	Agriculture as significant contributor to national	Spatial Indicators based on CSIR Mesozones, 2017.	StatsSA, 2011; Quantec 2016.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
	Resource Economy and Food Production	economies and sector employment	Indicating areas of highest agriculture GVA output (Mesozones). Also includes 20 largest LM with highest agriculture GVA.	Towards Spatial Perspectives in support of the NDP: Unpublished Report prepared by the CSIR for Economic Development Department (EDD), 2015.
		Agriculture as significant contributor to local economies and employment	GVA percentage for Agriculture sector for total GVA- presented per Mesozone, 2016.	Towards Spatial Perspectives in support of the NDP: Unpublished Report prepared by the CSIR for Economic Development Department (EDD), 2015
		Agriculture land significance for national food production	Graphic illustration of land with high agriculture potential (land capability) and high value production (crop fields data)	Department of Agriculture , 2018 and CSIR Town Typology, 2018 – reflecting GVA sector values.
Figure 20	**Movement, Connections and Flows – Connectivity**	Built Environment Infrastructure Focus areas.	Built-Areas of most dense built-up development AND biggest backlogs nationally identified to indicate areas of most significant focus for continued service delivery, maintenance investment and related enterprise opportunity in construction, green energy sectors. Based on SACN Functional Town Area Typology, 2016 and updated	Towards Spatial Perspectives in support of the NDP: Unpublished Report prepared by the CSIR for EDD;

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			with CSIR Town Area Typology 2018.	
		National Connectivity	Drawn from key road and rail routes reflected by National Department of Transport – in the 2015 NATMAP	National Transport Master Plan, 2015
		Freight flow	Spatial reflecting three main freight volumes; mining, manufacturing and agriculture commodities.	Logistics Barometer 2016, University of Stellenbosch. 2014 Freight Flows
Figure 21	**Movement, Connections and Flows – Inter-regional Trade Connections**	Global, inter-regional, national and rural development networks, gateways and anchors for service, industry, export/import, business, administration, tourism, etc. Attractors, centres, access points (e.g. cities, towns, SEZs Ports) and connectors (e.g. ranging from corridors to road, rail, air, sea connections).	Identification of regional and rural economic development network anchors and gateways, based on indicators developed in accordance with OECD and EU criteria for identification of regional cross-boundary economic flows, international studies and SADC and African case study analyses. Including	Towards Spatial Perspectives in support of the NDP: Unpublished Report prepared by the CSIR for Economic Development Department (EDD), 2015; SOCR 2016 Integrated National Export Strategy (INES): "Export 2030". The dti
Figure 22	**Movement, Connections and Flows – Energy Energy Infrastructure and Potential**	National Energy Potential and Network Corridors	Renewable Energy Development Zone combined with wind and solar projects sourced from as CSIR projects	Towards Spatial Perspectives in support of the NDP: Unpublished Report prepared by the CSIR for Economic Development Department (EDD), 2015

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
		Energy Infrastructure and Potential	Reflects current energy infrastructure as well as potential areas for green energy. Utilising SA wind atlas and geospatial analysis on potential for solar energy. Solar radiation is a general term for the electromagnetic radiation emitted by the sun. We can capture and convert solar radiation into useful forms of energy, such as heat and electricity, using a variety of technologies. Amount of energy per m2 per day for January to December.	ESKOM, 2017 The World Bank, 2017. Solar resource data: Solargis.
Figure 23	**Movement, Connections and Flows – ICT Information Communication Technology**	ICT Fibre connection distance	Connection to nearest main fibre infrastructure connection point – values calculated by small area. Thematically illustrated.	MERAKA CSIR, 2018.
Figure 24	**Institutions and Service Delivery – Basic Service Delivery** National Scale Overview of Progress and Challenges With Basic Service Delivery	Access to Water, Electricity and Sanitation 1996-2011 in relation to no of households	Mesozone information percentage service accessible comparing 1996 to 2011	StatsSA 2011 National Treasury 2018.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
		Service Delivery maintenance stress 2016	LM values of prolonged water and electricity outages for 2016.	Government Performance in South Africa 2016
Figure 25	**Municipal Financial Viability**	Comparison of municipal budget per household for municipalities of over 50 000 and densities greater than 500 p/km2	Reflect municipalities with population above 50000 and densities higher than 500 persons/km2. Reflect budget per household.	IUDF Presentation, 2018.
		Financial Distress Score	Local municipal distress score.	National Treasury, Municipal Financially Distressed Municipalities 2016-2017
Figure 26	**Institutions and services – Municipal Capability**	An Indication of current Governance support focus areas	Intermediary Cities Programme municipalities with support type received and municipalities that have been identified for support.	National Treasury, Municipal Support Focus Areas per Local Municipality, 2016-2017
Figure 27	**Institutions and services – Municipal Capability**	Municipal Capability- Capable Cities Index Components of Municipal Capability		Parnel, S., Moodley, N., and Palmer, I., 2017. Defining the four components of capability
Figure 2	**Institutions and services – Social Services People and Service Economy**	Government Services People and Service economy	Spatial Indicators based on CSIR Mesozones, 2017. Reflecting government and service sectors (GVA values interpolated) combined with towns and roads network. Also reflected on smaller map is the	StatsSA, 2011; Quantec 2016. CSIR calculations, 2018.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			generalised service extent of larger regional centres.	
		Social Services Demand	Approximate new facility demand calculated based on additional population growth from 2016-2050 based on Greenbook projections and applying social facility provision standards	Greenbook 2019 CSIR Guidelines for the Provision of Social Facilities In South African Settlements First edition 2012, reprinted 2015
Figure 29	**The National Spatial Development Vision Statement**		NSDF Graphic	NSDF technical team.
Figure 30	**NDP Levers and Objectives - Framework**		NDP Graphic	National Planning Commission. 2011. National Development Plan: Vision for 2030. Pretoria. NPC.
Figure 31	**National Spatial Development Levers**		NSDF Graphic various illustrating concepts.	NSDF Technical Team, 2018
Figure 32	**Linking National Spatial Development Concepts to the NDP and SPLUMA**		NDP Lever Capable State SPLUMA Principle Good Administration addresses in implementation framework	National Planning Commission. 2011. National Development Plan: Vision for 2030. Pretoria. NPC.SPLUMA 2013
Figure 33	**Schematic Presentation of a Regional-Rural Development Model**	Urban and Rural Region National Urban Core Regional Development Anchors Small Service Centre Small Town Rural Settlement	Defined by NSDF based on CSIR Functional Town Area Typology See Annexure for list of places and definitions	NSDF Technical Team, 2018.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
Figure 34	**A National Spatial Social Service Provisioning Models ("Social Service Wheel")**	Service Wheel	Adapted for NSDF town types and based on CSIR Guidelines for the Provision of Social Facilities In South African Settlements First edition 2012, reprinted 2015 Social	http://stepsa.org/service_wheel_typology.html
Figure 35	**Illustration of Town Service Reach**	Regional Centre and Service Town reach	Approximate service area of town categories based on access distance of typical services. Regional Centres have a bigger reach with more and larger services. Service reach up to 100km in sparse areas but not less than 30km. Service Towns have a typical reach of 20-30 km	CSIR illustration.
Figure 36	**National Development Pattern Transformed**	NSDF Consolidated Settlement Scenario and population growth per settlement types	Developed by the NSDF team and based on The Medium Green Book Projections adapted based on the NSDF Spatial Vision	NSDF Vision and technical team, 2018
Figure 37	**Putting it all Together**	Graphic illustration of Spatial Vision	NSDF Graphic	NSDF technical team.
Figure 38	**Ideal National Spatial Development Pattern to NSDF sub-frames**	Graphic illustration of link between Ideal NSD Pattern to sub-frames	NSDF Graphic	NSDF technical team.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
Figure 39	**National Spatial Development Framework**		See Implementation framework for detail descriptions of regions	NSFD Technical Team, 2018.
Figure 40	**Inter-Regional Connectivity Sub-Frame**		Main cross regional road and rail corridors reflected by NATMAP (National Department of Transport) and Cross Border Road Agency.	NATMAP, 2015.
Figure 41	**National System of Nodes and Corridors Sub-Frame**	Urban Regions National Urban Nodes Regional Development Anchors	See Annexure for definitions and list of places	CSIR Functional Town Area, 2018
Figure 42	**National and Regional Settlement and Service Network**	Application of Rural Regional Service model to South Africa based on the Service Wheel	Analysis based on Settlement hierarchy of NSDF types. Feeder lines connecting smaller towns to larger centres.	NSDF Technical Team, 2018.
Figure 43	**National Resource Economy Regions Sub-Frame**	National Agri-Enterprises and Small Scale Farming Region	Productive areas existing and potential, including densely settled areas. Areas in more suitable future climate areas. Focus on small scale farming and related enterprises.	NSDF Technical Team, 2018.
		National Central Agricultural Heartland	Protect high-value agricultural land. See Annexure B for more	NSDF Technical Team, 2018.
		National Arid-Agri-Innovation Region	Primarily extensive agricultural activities, with pockets and	NSDF Technical Team, 2018.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			stretches of intensive irrigation-farming, (2) mining clusters, (3) renewable energy farms/plants, and (4) small, compact settlements in an arid region	
		National Ocean & Aqua Culture Production	SA Off-Shore Coastal Zone	NSDF Technical Team, 2018.
		National Eco-Resource Production and Livelihoods	Includes national strategic water source areas. Areas of agricultural potential but not developed	NSDF Technical Team, 2018. SANBI, 2018 Department of Agriculture , 2018
		High Value Agricultural Production	Areas of high value production (crop fields data)	Department of Agriculture , 2018 and CSIR Town Typology, 2018 – reflecting GVA sector values.
		Productive Agriculture Regions	Graphic illustration of land with high agriculture potential (land capability) based on interpolation of above	NSDF Technical Team, 2018.
		Nationally Protected Areas	The South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) are GIS inventories of all protected and conservation areas in South Africa. The database	Department of Environmental Affairs, 2018. Sourced from https://egis.environment.gov.za/

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			includes data on privately owned protected and conservation areas.	
Figure 44	**National Movement and Connectivity Infrastructure System Sub-Frame**		Key road and rail routes as reflected in NATMAP Development corridors are routes along densely settled areas. Reflecting ports of entry/exit and economic zones.	NATMAP, 2015 DTI, 2014.
Figure 45	**National Ecological Infrastructure and Natural Resources Base Sub-Frame**	National Protected Areas	The South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) are GIS inventories of all protected and conservation areas in South Africa. The database includes data on privately owned protected and conservation areas.	Department of Environmental Affairs, 2018. Sourced from https://egis.environment.gov.za/
		Marine Protected Areas	Part of national protected areas	Department of Environmental Affairs, 2018.
		National Ecological and Biodiversity Management Areas (CBA's ESA's)	CBAs - Areas that are required to meet biodiversity Targets	SANBI, 2018 (https://www.sanbi.org/)

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
			ESAs - Areas that are not essential for meeting biodiversity targets, but that plays an important role in supporting the functioning of CBAs and/or for delivering ecosystem services	
		Strategic Water Source Areas	Strategic Surface e and Ground Water - Strategic ground and surface water areas can be described as the country's most important water sources, because they supply a disproportionately high amount of the country's water in relation to their size Statistics calculated are based on land areas, transfers and population pressure using population data from the Mesoframe and CSIR Town Typology 2018.	Natural Resources and Environment (NRE) Unit at CSIR and Water Research Commission(WRC), 2017. [Commissioned research project]
		Inter-Basin Water Transfer line	Transfers captured through spatial analysis and enquiry.	Mandala GIS, 2018
		Rivers and Dams	Geospatial data sourced from Dept Water Affairs	DWA, 2013

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
Figure 46	**Strategic Spatial and Implementation Action Areas**		See discussion of importance and role of each Implementation areas in the following section for more details	Interpretation of all available information indicated above
Figure 47	**Ideal National Spatial Development Pattern to Strategic Action Areas**	Linkage between Ideal SD Pattern to NSAA	NSDF Graphic	NSDF technical team.
Figure 48 - 51	**National Transformation Corridors**	Coastal Transformation Corridor Eastern Escarpment Corridor Northwestern Transformation Corridor	Areas of large population concentration often is sprawling rural settlements forming a belt of development along key national routes but also areas having a major role to play with respect to future water and food security.	NSDF Vision.
Figure 52 - 53	**Central Innovation Belt**	Central Innovation Belt	Areas currently largely dependent on a single economic sector (mostly Mining) that requires diversification and Innovation to grow and maintain its prominence in future	NSDF evaluation
Figure 54 - 59	**National Resource Risk Areas Overview**	Upper Vaal River Catchment Olifants River Catchment Waterberg River Catchment uMngeni River Catchment	National Resource risk areas include areas where water production, Human Settlement , Agriculture and /or Mining	NSDF evaluation

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
		Berg & Breede River Catchment	and dense population areas are in competition and intersect and where the catchments are stresses often due to pollution	
Figure 60 - 63	**National Urban Regions Overview**	Gauteng Urban Region Cape Town Urban Region eThekwini Urban Region	Urban Regions have large populations and economy and are expected to continue to grow. They must play a critical role of providing homes and employment for a large % of the population now and in future. See Annexure for description and detail	NSDF analysis based on CSIR Functional Settlement Typology 2018
Figure 64 - 65	**Arid- Innovation Region Overview**	Large arid area of the country (48%) that is very sparsely populated but interspersed with mostly small towns and settlements.	This is area is expected to experience major impacts of climate change with respect to higher temperatures and lower rainfall. Innovation will be critical for the survival of people and economy of this region.	NSDF evaluation
Figure 66	**Workstream Overview**	NA	NSDF Graphic	NSDF technical team.
Figure 67	**Championing of Spatial Transformation**	NA	NSDF Graphic	NSDF technical team.

FIGURE. No	FIGURE TITLE	Specific Terms or components of figures	Where obtained from/How calculated?	Reference/Source for more evidence/further reading
Figure 68	**Clear Line of Sight**	NA	NSDF Graphic, Adapted from DPME, 2018.	DPME presentation – not published, sourced from workshop.
Figure 69	**National Role in System of Planning, Budgeting , Implementation and Monitoring**	NA	NSDF Graphic	NSDF technical team.
Figure 70	**The Envisaged Role of the NSDF in Plan Preparation, Budgeting, Implementation and Review Cycles in Government**	NA	NSDF Graphic	NSDF technical team.
Figure 71	**The Envisaged Role of the National Spatial Development Frame and Sub-Frames in Spatial Planning**	NA	NSDF Graphic	NSDF technical team.
Figure 72	**Priority National Spatial Action Areas**	NA	NSDF Graphic	NSDF technical team.
Figure 73	**NSDF Implementation Cycles Impact over time**	NA	NSDF Graphic	NSDF technical team.
Figure 74	**NSDF Implementation Cycles Overview**	NA	NSDF Graphic	NSDF technical team.
Figure 75	**NSDF Implementation – Level of Focus over Time**	NA	NSDF Graphic	NSDF technical team.

[i] From: http://www.businessdictionary.com/definition/economic-sector.html.

[ii] State of the Nation Address by the President of the Republic of South Africa, Mr Cyril Ramaphosa, 16 February 2018, Parliament.

[iii] Report of the High-Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change. (2017). Page 32.

[iv] As quoted in The National Development Plan (2012). Page 24.

[v] Summarised from the IUDF, the publication "*South Africa's national urban development policy – the IUDF",* both published by CoGTA and the publication "*Localising the New Urban Agenda: South Africa Discussion Document*" (2018).

[vi] Source: Prof J van Tonder for CSIR/IRDC Green Book on Climate Change Adaptation.
[vii] Source: Wright and Noble 2012 & 2014; Makgetla 2010.
[viii] See Greenberg. 2013. Institute for Poverty, Land and Agrarian Strategies, UWC. Page 18, 19; See Cousins (2015), Aliber et al (2017).

[ix] The level of service per settlement typed indicated in the "Service Wheel" is based on the following previous work that is documented in:

- Green, Cheri; Mans, Gerbrand; Ngidi, Mawande; Sogoni, Zukisa; & Maritz, Johan. Using Catchment Areas Analysis and GIS based Spatial Analysis for Prioritising Spatial Investment in Non-Metro South Africa- 2016. ISOCARP Durban, 12-16 September 2016. (Short title 'Prioritisation of Towns for Social Investment").
- Green, CA & Argue, TC. 2012 CSIR Guidelines for the Provisions of Social Facilities in South African Settlements. August 2012: ISBN 978-0-7988-5603-4. (Short Title CSIR Social Facility Standards).
- Green, C. & Argue, T. 2016. Guidelines for the Differentiated Provision of Social Services in Rural Areas. Commissioned by the Department of Rural Development and Land Reform (Short Title Differentiated Social Facility Standards).
- CSIR Town Area Typology 2018

[x] Where relevant, more detail on the National Sub-Frames is provided in Annexure B.
[xi] ESKOM (2016).
[xii] SADC (2012).
[xiii] SADC (2012).
[xiv] Earle & Malzbender (2013).
[xv] As such, the process coordinated by the *IUDF Working Group* to expedite urban land reform is noted and strongly endorsed.
[xvi] Meso Frame: see http://stepsa.org/socio_econ.html
Maritz, J., van Huyssteen, E. Green, C. and Sogoni, Z. South African Functional Town Typology (CSIR 2018 v2). Available at www/stepsa.orga.za.

[xvii] Green Book. 2019. Green Book: Adapting South African settlements to climate change. www.greenbook.csir.co.za
Link to the climate change projections findings:
Engelbrecht, F., Le Roux, A. & Arnold, K. 2018. Green Book – Detailed projections of future climate change over South Africa. https://pta-gis-2-web1.csir.co.za/portal/apps/GBCascade/index.html?appid=b161b2f892194ed5938374fe2192e537 Pretoria: CSIR
Link to the population projections findings:
Le Roux, A., Arnold, K., Makhanya, S. & Mans, G. 2018. Green Book – South Africa's urban future. Growth projections for 2050. https://pta-gis-2-web1.csir.co.za/portal/apps/GBCascade/index.html?appid=5180459a765c4e63bfb3fa527c7302b3 Pretoria: CSIR
[xviii] A Regional Spatial Development Framework, which serves as an example of such an initiative, is being proposed for the Vaal River area in the Northern Free State.
[xix] The Nama Karoo Regional Spatial Development Framework driven by SALGA, is a good example of such an initiative.
[xx] DPME, 05-10-17. Towards Institutionalising Planning, Monitoring and Evaluation: An overview Document Prepared for the MP&E Forum of 12 to 13 October 2017, DPME Report, pg. 6.
[xxi] Departments tasked with and engaged in activities that aim to support the work and impact of sector departments and spheres with specific public service delivery mandates.

ANNEXURES: DRAFT NATIONAL SPATIAL DEVELOPMENT FRAMEWORK

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

planning, monitoring & evaluation
Department:
Planning, Monitoring and Evaluation
REPUBLIC OF SOUTH AFRICA

2030 NDP

Contents

Annexure A: Background to selected data layers used for the analysis of fine grained population, socio economic and climate change analysis and projections

A1. Supportive Information on Spatial Information and Models

This Annexure is not exhaustive and only provides limited information in support of the Draft NSDF 2019.

Over the past number of years, the CSIR, together with other role players, has invested in building capability to provide spatial planning, analysis, modelling and platform support to government, with a focus on strengthening strategic regional, inter-regional and intergovernmental planning, resource allocation and monitoring and evaluation in South Africa. A key focus was the ability to enable a 'whole of country' spatial relational analysis and comparison of key settlement and population data and indicators.

A2. Regional Spatial Data Frame used for Indicators and Settlement Pattern Analysis

- http://stepsa.org/socio_econ.html for more detail and to download data

MESOFRAME

The Mesozone data set is referenced several times in the NSDF and was used for the fine grained spatial analysis of a large number of variables and indicators. For more information and to download data, please see http://stepsa.org/socio_econ.html

The 'Mesoframe' is a demarcation of South Africa into a complete grid of approximately 25 000 spatial units. These mesozones are not uniform in shape but aim to be approximately the same size (~50km^2) for improved comparison of different spaces and more accurate visual representation and interpretation of data. The mesozones were created in such a way that they (1) fit within the current municipalities, and (2) are largely homogeneous with respect to other significant geo-economic, topographic and historic political area demarcations. The zone boundaries correspond with major travel barriers (such as rivers) as well as areas demarcated as uninhabited/ sparsely populated (Mountainous/ wilderness areas) and areas with medium to high levels of human activity (such as fertile valleys or built up areas).

The population and socio-economic datasets are assigned to mesozones based on an algorithm developed by the CSIR, which is based on the principles of dasymetric mapping. This approach is also used to calculate population distribution at a fine scale. The StatsSA 1996 (Enumerator Areas - EAs), 2001 (Sub Places - SPs), 2011 (SPs) and 2016 (SPs) population figures are used as the input-data for the respective

years. These data sets have different spatial demarcations and the data has thus been re-aligned to the mesozones to create a comparable time series data set using secondary data. The Spot Building Count (SBC), for which ESKOM is the data-custodian, is used as the secondary dataset to assign/ predict the underlying statistical surface of the origin data.

The GVA data for the different economic sectors are produced at local municipal level by Quantec. The municipal level GVA data has been re-assigned to the mesozones using the same principles of dasymetric mapping. Secondary data is used to represent the potential points where production is occurring to re-assign the economic production data to the mesozones. The total employment index per mesozone is derived from the GVA index by firstly calculating the ratio of GVA production per sector to the employment per sector for each local municipality. The employment and GVA data for the different economic sector factor is then multiplied with the economic production values per mesozone.

TOWN TYPOLOGY (2010-2018)

In 2015, the updated CSIR/SACN functional settlement typology that provided a mechanism to identify, calculate and analyse a set of development information and trends pertaining to the range of towns and cities, as well as high density rural settlements across South Africa was published. This typology enables an understanding and analyses of the network of settlements, towns and cities and the hierarchical and functional relationships between them, especially related to government and economic service provision and migration. Given the fact that spatially comparable administrative information covers wall-to-wall municipal jurisdiction areas, the functional town area demarcation and town profiling was used extensively as basis to describe and compare cities and towns across South Africa, as well as town growth trends in support of government policy. This *inter alia* includes the use of (1) the 2010-version of the typology in Chapter 8 in the NDP, 2012; and (2) the updated version in the IUDF, 2015, the SACN SOCR, 2016 and the DRDLR Social Facility Toolkit, 2016.

In February 2018, the CSIR made available a further update and rework of the settlement typology that included:

- Updated socio-economic indicators based on the CSIR Meso-Frame up to 2016; and
- A derived understanding of potential roles of towns within their regional contexts, including an analyses of national and regional gateways and anchors conducted for the Economic Development Department in 2014.

A finer-grained identification and description of small towns and growing rural settlements, considering their service role within local hinterlands and not merely based on the population size but also the economy. This was further informed by the, CSIR Social Facility Settlement Prioritisation, 2016; DRDLR Social Facility Toolkit, 2016 and the SALGA Small Town Regeneration Programme, 2017-2018.

The typology was also updated to include the identification of new and expanding settlement areas by using the unique CSIR Settlement Footprint created in support of the CSIR Green Book, 2019. In this process, the built up area of each settlement was demarcated using a combination of satellite imagery, housing point data and fine grained StatsSA population data sets. This enabled clear demarcation of built-up areas that in turn enabled more accurate calculation of population numbers and profiling of individual settlements and analysis of changing settlement dynamics and trends.

As such, the typology enables calculation of the population and the economy of functional town areas (as opposed to municipal area statistics) and a comparison of town areas relative to non–town areas as well as the ability to explore regional and spatial inter-relations of settlements as well as the trends within specific types of settlements. The Typology also enables regional-scale, temporal and spatial comparison of settlements regardless of administrative boundaries. For access to the spatial frame, and socio-economic indicators, please see 'Indicator' where the data can also be downloaded.

Bibliography:

For more about the CSIR South Africa Functional Town Typology, see van Huyssteen, E. Green, C. Sogoni, Z., Maritz, J. and McKelly, D. South African Functional Town Typology (CSIR 2018 v2).

A3. Population Projections and Spatial Settlement Growth Modelling and Allocation

Population projections and location specific scenario modelling for South Africa was undertaken by the CSIR as part of the Green Book (2019) process. This was made available for use in the NSDF process and was used to explore the most likely spatial implication of population growth projections for both low and high in-migration scenarios. This growth scenario is a first of its kind to explore the implication of population growth taking into consideration migration patterns, as well as spatial-locational attraction and distribution of growth.

In compiling the NSDF, use was also made of the following Green Book (2018) population modelling outputs:

- *National population growth projections at country level within South African-specific context and scientifically verified up to 2050 for two growth scenarios.* A medium and a high growth scenario were generated by the Green Book 2019 – both verified by expert reference groups. After consideration of the scenarios and benchmarking against other projections, the NSDF made use of the medium population growth scenario with respect to planning and implementation.
- *Downscaled medium population growth scenarios* developed at provincial and district scales to understand the most probable regional growth pressures for 2030 and 2050.
- A novel and innovative settlement growth model to derive *settlement level population projections.* This model has been developed to utilise provincial and district scale population growth projections to derive and model growth of individual settlements. The model utilises a gravity model, based on "population potential" during the population growth allocation process. The latter is a measure of the "attractive force" of a particular grid cell for further population growth considers relational spatial impacts in the model. The expectation of different rates of change for the different settlement types was accounted for in the model-making that was done in analysing the spatial attraction of existing agglomeration economies and concentrations based on the CSIR Functional Town Typology, 2018 and CSIR Open Settlement Footprint, 2017*.
- The results of the *Population Projections and CSIR Town Growth Model* were used in the NSDF 2018 as a *"Without Intervention National Settlement Scenario"* of most likely growth pressures for settlements in South Africa.
- The *"Without Intervention National Settlement Scenario"* including national growth projections of model results were then used with the NSDF Vision and implementation frames and the

expected impacts of growth and available resources, as highlighted in **Part 3** of the Draft NSDF, to construct an alternative envisaged settlement-allocation pattern of the *"NSDF Implementation Settlement Scenario"* that is based on a sustainable national settlement growth outcome through successful implementation of the NSDF Vision. This alternative NSDF Settlement Allocation Scenario is *"a Vision of a preferred outcome of future spatial patterns given the available information"*, and was informed by (1) significant national development objectives, (2) the national spatial development vision, (3) the national spatial development concepts, (4) resources and outcomes as attractors, and (5) global and national risks as push factors.

The CSIR Green Book modelling approach, inputs and high level outputs available are set out in Figure A1 and national level results in Figure A2.

The population projections of Prof L. van Tonder, the lead expert for the CSIR, Green Book population projection work, 2018 have been proven to be consistently accurate over time when compared to World Bank and United Nations Projections. The modelled national population projections for two scenarios, as developed from the model, are indicated in **Figure 2**. High and medium scenarios refer to differences in international in-migration scenarios. National population projections clearly illustrate the need to plan for at least a 30% increase in population by 2050, with the medium scenario indicating a population of 75 million by 2050, and the higher in-migration scenario, a population of 80 million by 2050. This can have significant spatial implications, with the population projected to grow primarily in the urban core and secondary cities and large towns.

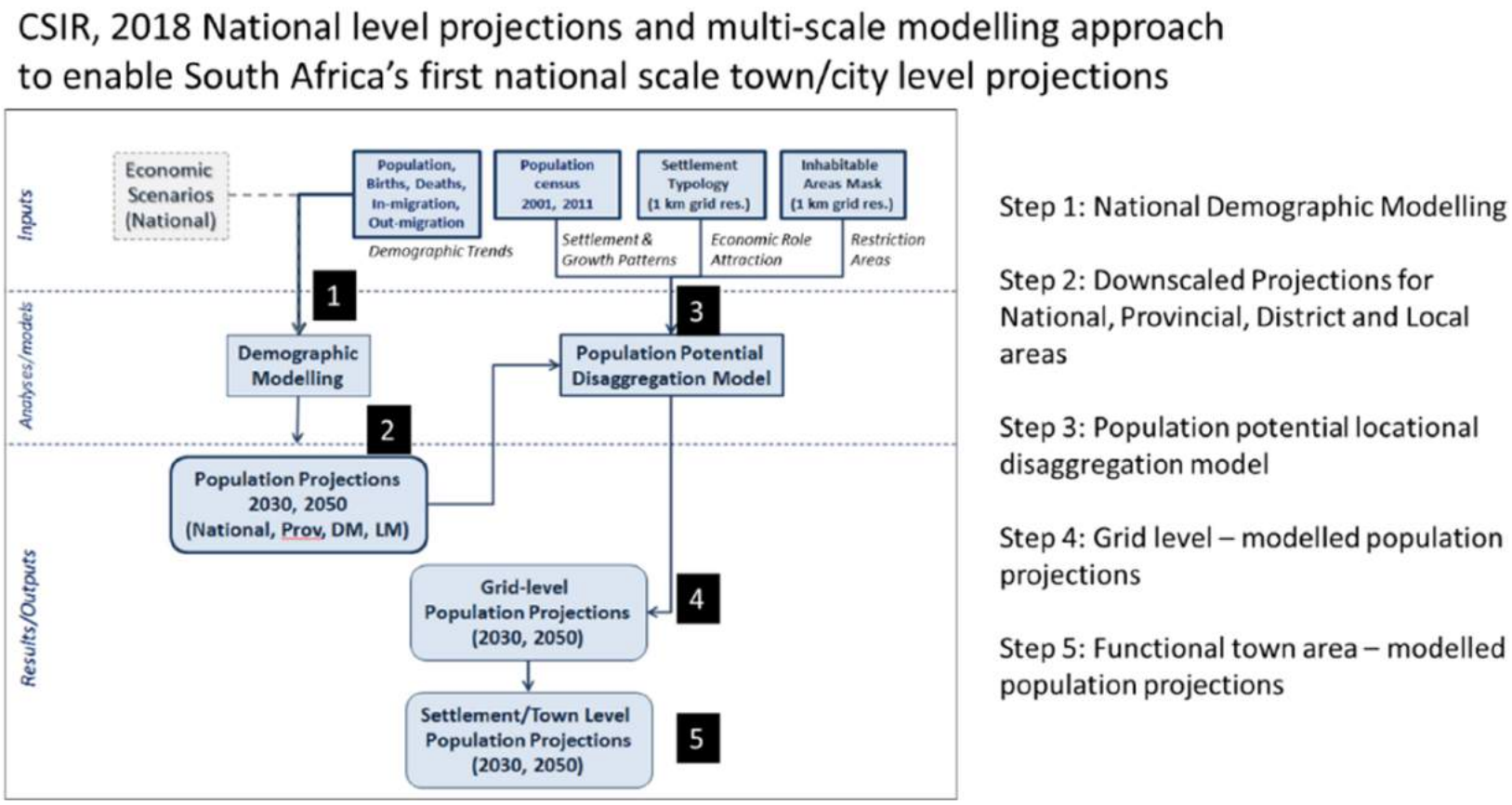
#***The Settlement Footprint*** *defines the spatial extent of the actual built up areas of each settlement and differentiates this area from the surrounding rural hinterland.* This layer aims to provide a more accurate GIS based extent of the built up footprints of SA settlements. The Settlement footprint was recently developed for South Africa, and was defined based on a spatial extent of the settlement footprint created by using a combination of StatsSA small areas and main places, the ESKOM spot building count (adapted and corrected) and land cover related information. Demographic information for the respective settlements has been compiled using the outlined data through a spatial disaggregation process. The population baseline data made use of StatsSA, 2011 demographic data. For more information see (Maritz et al, 2018 – In process) Settlement footprint layer 2017, CSIR 2017.

Bibliography:

- Green Book. 2019. *Green Book: Adapting South African settlements to climate change.* www.greenbook.csir.co.za
- Griffin, J. (2012, April 3). *The Impact of Climate Change on South Africa* . Retrieved June 13, 2018, from Climate System Emergency Institute:; ttps://www.climateemergencyinstitute.com/cc_s_africa_griffin.html
- Ziervogel, G., New, M., Archer van Garderen, E., Midgley, G., Taylor, A., Hamann, R., et al. (2014). Climate change impacts and adaptation in South africa. *WIREs Climate Change*, 605-620.

Link to the population projections findings:
Le Roux, A., Arnold, K., Makhanya, S. & Mans, G. 2018. *Green Book – South Africa's urban future. Growth projections for 2050*. https://pta-gis-2-web1.csir.co.za/portal/apps/GBCascade/index.html?appid=5180459a765c4e63bfb3fa527c7302b3 Pretoria: CSIR

Figure A1: CSIR - National level projections and multi-scape modelling approach to enable South Africa's first national scale town/city level projections



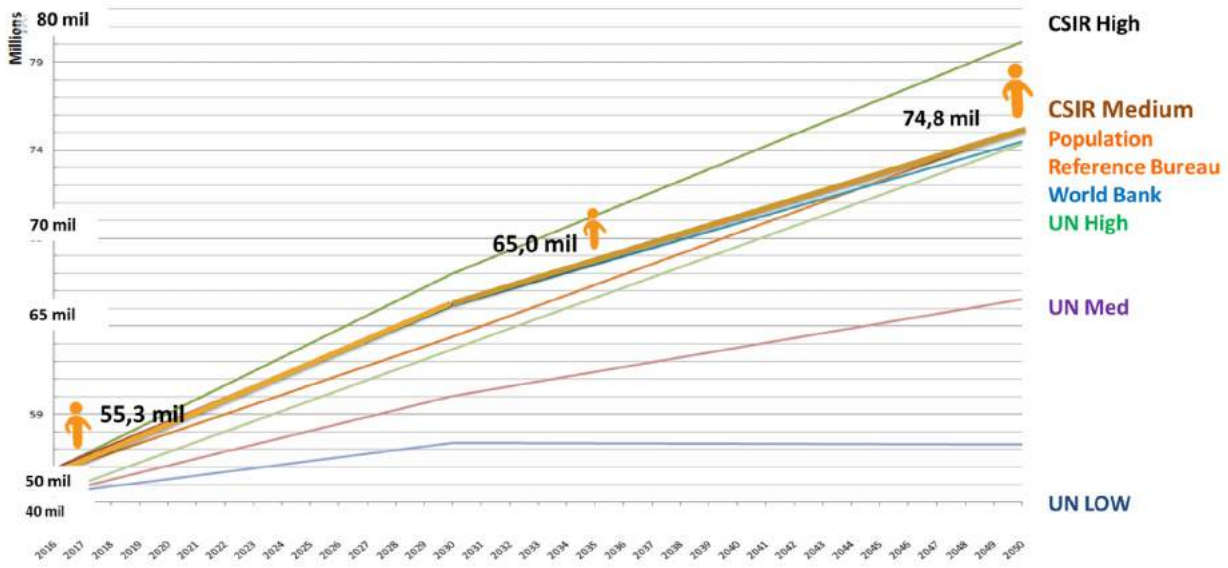


Figure A2: National level projections

Source: CSIR, 2018. Green Book, Population Growth Projections.

Using national level growth projections, provincial and district level allocations were modelled and results can be seen in Figure A 3 and A4. These were in turn used as inputs for the location-specific modelled results at settlement level using a gravity based model. In addition to demographic trends the gravity model developed by the CSIR currently enables consideration of:

- Past settlement growth patterns,
- An economic attraction pull factor depending on the role of a settlement/town or city (using the CSIR, Town Area Typology, 2018 town demarcations and profiles); and
- Location-specific exclusion areas.

The projections were downscaled and the methodology tested against a simulation of 2001-2011 population data that provided very high levels of accuracy-98% for district level and 95% for settlement level. Please see the diagrams below for examples of downscaled district and settlement allocations as used for the "NSDF 2018 Without Intervention National Settlement Scenario" (Medium Population Growth Projections and CSIR Green Book Town Growth Model Results). **Figure 3** provides information of the downscaled projections at a provincial level.

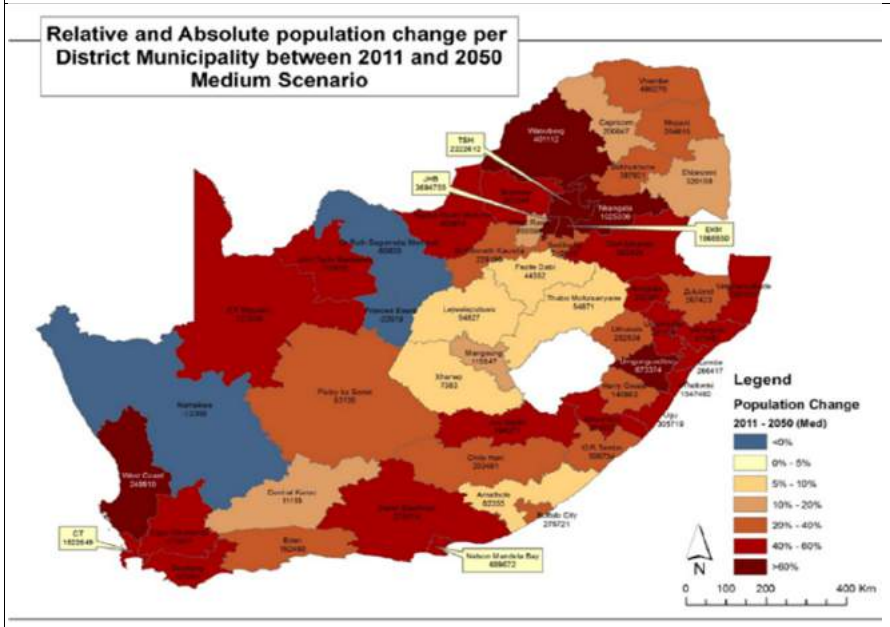
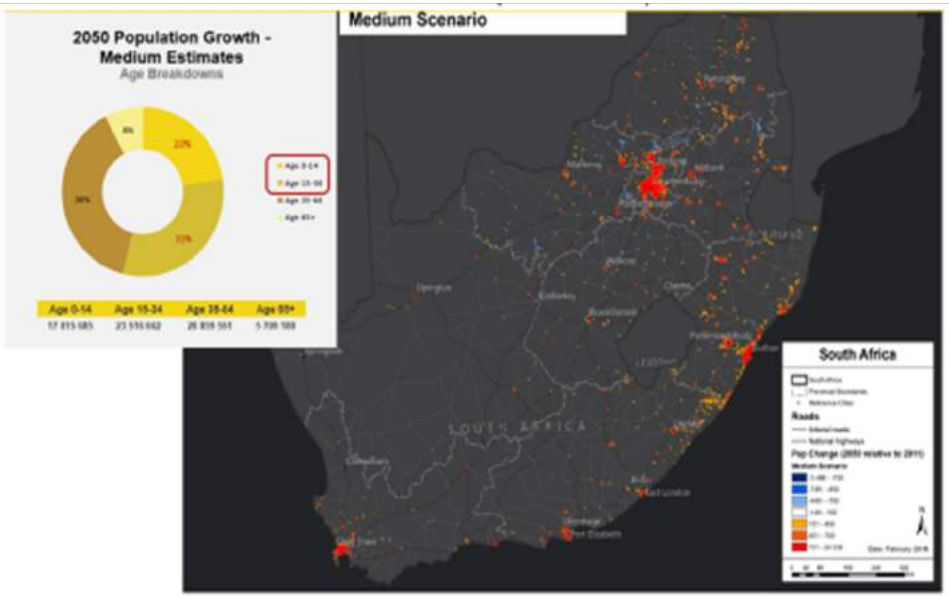
Figure A3: Provincial level projections (Units shown = millions of people)

CSIR, 2018 Downscaled Cohort Component Projections for Provinces

	2016		2030		2050	
	Med	High	Med	High	Med	High
EC	6,89	6,93	7,93	8,13	9,02	9,56
FS	2,75	2,77	2, 86	2, 94	2, 99	3, 16
GT	13,39	13,48	16,67	17,14	20,30	21,79
KZN	10,91	10,99	12,85	13,19	14,75	15,80
LIM	5,71	5,75	6,59	6,76	7,09	7,57
MP	4,30	4,33	5,11	5,24	5,91	6,26
NC	1,19	1,19	1,31	1,34	1,39	1,47
NW	3,97	3,99	4,55	4,61	5,12	5,48
WC	6,23	6,27	7,41	7,58	8,53	9,02
Total	55,33	55,70	65,27	66,99	75,10	80,14

Source: CSIR, 2018. Green Book, Population Growth Projections.

Figure A4: District and Settlement level down scaled medium growth projections: Population change 2011-2050 for "Without Intervention"

CSIR, 2018 Downscaled Cohort Component Projections at <u>District Scale</u> 2011-2050 Population Growth Estimates Medium Scenario (2011-2050)	**CSIR, 2018 Downscaled Cohort Component Projections at <u>Settlement Scale</u> 2011-2050 Population Growth Estimates Medium Scenario (2011-2050)**
	

Source: CSIR, 2018. Green Book, Population Growth and Settlement Projections.

A4. Climate Change Projections

Climate change is a term that generally refers to a shift in weather phenomena associated with an **increase** in global average temperatures that would have occurred normally over long time periods. Human intervention, however, is rapidly affecting the average surface temperatures, which in turn are resulting in changes to climate patterns. In compiling the Draft NSDF, use was made of climate change projection data from the CSIR Green Book project.

Overview of methodology used for Climate Modelling

Down Scale Climate Modelling at 8 km resolution was conducted by Prof Francois Engelbrecht, CSIR. The 8 km resolution projections were obtained by further downscaling of the CSIR's existing set of 50 km resolution CORDEX (Coordinated Regional Downscaling Experiment) projections of future climate change. These CORDEX projections are for two emission level mitigation scenarios, namely Regional Concentration Pathway 8.5 (RCP8.5; low mitigation) and RCP4.5 (high mitigation). For each of these emission pathways, six global circulation models (GCMs) that contributed to Assessment Report Five (AR5) of the Intergovernmental Panel on Climate Change (IPCC) were downscaled to 50 km resolution over the globe, as part of the CSIR's contribution to CORDEX.

In the Green Book project, all these simulations (twelve ensemble members in total) were downscaled further to 8 km-resolution over South Africa. The projections were analysed statistically in the Green Book of South Africa Climate Change Projection report and the implications for South Africa discussed. The uncertainty range described by these projections is still to be described within the context of the much larger, but lower resolution ensemble of AR5 GCM projections.

Results and Implications

In order to sufficiently identify the spatial implications of climate change for South Africa, several fine scaled climate change projections were recently undertaken as part of a project entitled: "Settlement design guidelines for climate change adaptation in South Africa" (Council for Scientific and Industrial Research, 2016)1. The resulting projections generally predict severe temperature increases for Southern Africa. It is especially the northern and the western parts of South Africa that can expect significantly hotter average temperatures and more very hot days per year by 2050. By the end of the century, temperature increases of between 4 and 7°C can be expected over the interior of the country.

Furthermore, generally drier conditions and the more frequent occurrence of dry spells are plausible over parts of the interior as indicated in Figure 7. Areas most affected by decreases in rainfall are the Western Cape (winter rainfall region), parts of the Northern Cape, central part of the Eastern Cape and areas in Mpumalanga along the eastern escarpment as well as parts of the Limpopo Province.

Increase in annual-average near-surface temperatures are projected to occur over large parts of South Africa, including the western interior and northern parts of South Africa. This is critical as the central and northern parts of the interior are important agriculture production

1

areas currently. Aligned with the increase in temperatures is the likely increase in high fire-danger days, heat-wave days and very hot days and drier conditions referred to above.

For the period 2021-2050, relative to the period 1971-2000, (under low mitigation), rainfall is projected to increase over the central interior and east coast. This is most likely to go hand in hand with extreme rainfall events which have significant implications for infrastructure, flooding and water availability. Severe climate events are likely to endanger lives and cause damage to the built environment, which would have knock-on effects on economic development and negatively impact service delivery and sustainable development in the areas of greatest need. The negative impacts are not likely to be limited to the agricultural sector. The shift in rainfall patterns, together with rising temperatures and atmospheric carbon dioxide is likely to enhance vegetation growth in some regions, which could result in bush encroachment in Savannah regions – the Kruger National Park is one area at risk. This could change ecosystem and population dynamics, leading to a change in plant and animal communities (Griffin, 2012).

Climate change does pose a significant threat to South Africa's current water resources, food security, health, established infrastructure, as well as its ecosystem services and biodiversity. Considering South Africa's high levels of poverty and inequality, these impacts also pose critical challenges for national development (Ziervogel, et al., 2014).

Climate change also has serious long-term implications for human habitation and the productivity of agriculture. These projections suggest an increasingly important role for the central and south-eastern part parts of the country for (1) human settlement and (2) food production. To accommodate both, a concerted 'national spatial compaction, shrinking, and sharing-drive' will be required. Changing climate could also benefit areas allowing different crops to be cultivated in areas not previously possible. See consolidated summary map based on the projections done through the CSIR Green Book (2019) below.

Bibliography:

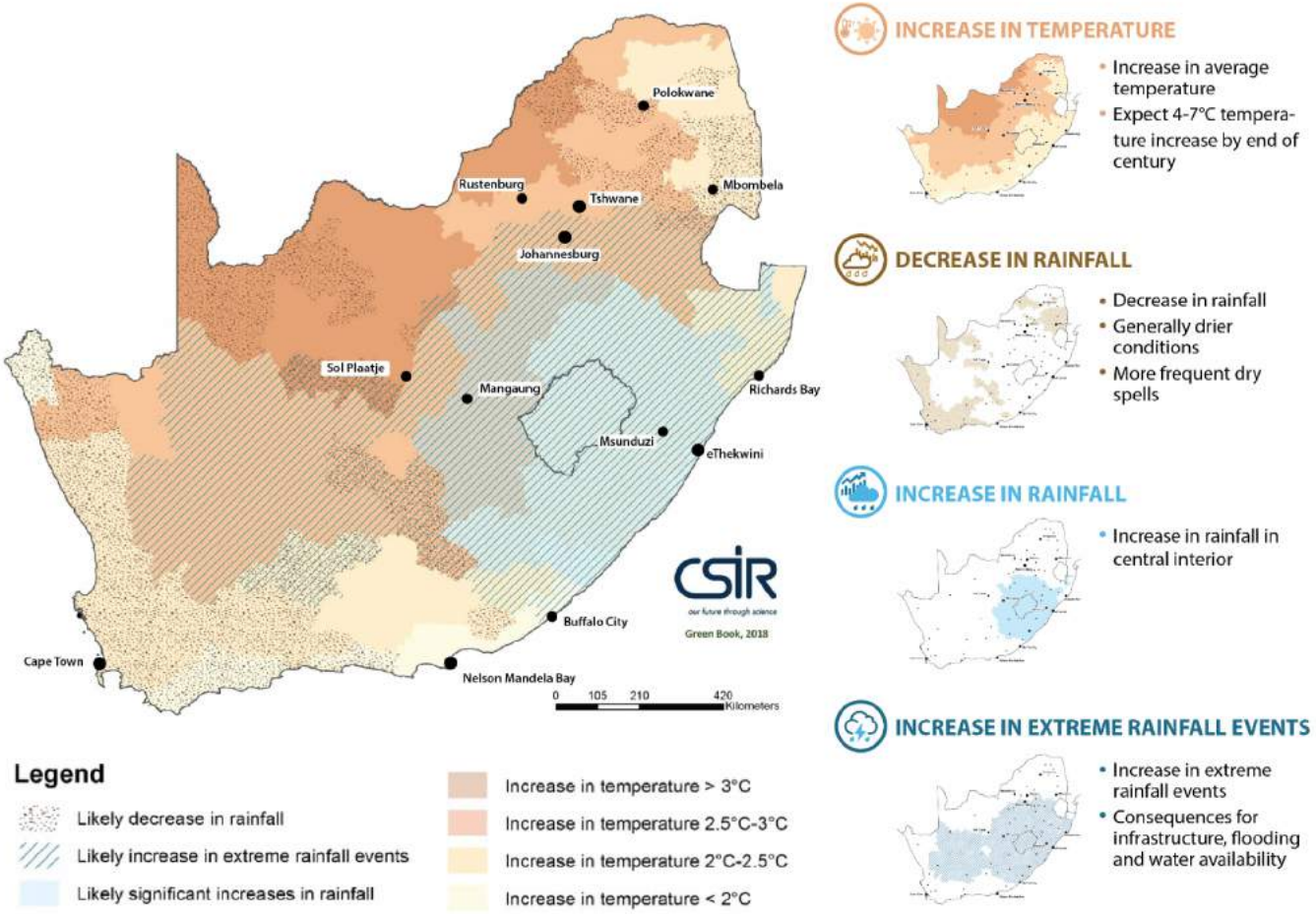
Link to the climate change projections findings:
Engelbrecht, F., Le Roux, A. & Arnold, K. 2018. *Green Book – Detailed projections of future climate change over South Africa.* https://pta-gis-2-web1.csir.co.za/portal/apps/GBCascade/index.html?appid=b161b2f892194ed5938374fe2192e537 Pretoria: CSIR

Green Book. 2019. *Green Book: Adapting South African settlements to climate change.* www.greenbook.csir.co.za

Griffin, J. (2012, April 3). *The Impact of Climate Change on South Africa* . Retrieved June 13, 2018, from Climate System Emergency Institute:; ttps://www.climateemergencyinstitute.com/cc_s_africa_griffin.html

Ziervogel, G., New, M., Archer van Garderen, E., Midgley, G., Taylor, A., Hamann, R., et al. (2014). Climate change impacts and adaptation in South africa. *WIREs Climate Change*, 605-620.

Figure A7. CSIR, Green Book Climate Change Projections, CSIR (2019



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Source: Green Book Climate Change Projections, CSIR (2019).

Annexure B: Spatial Descriptions in Support of National Spatial Development Framework

B1. Purpose and role of the Spatial Frame Annexure

This Annexure provides some of the spatial specific information and base considerations in support of the National Spatial Frame and sub-frames, but does not provide an extensive diagnostic and synthesis overview. This Annexure is aimed at providing more detail and clarity on selected conceptual spatial frame elements, and where relevant, an indication of spatial specific extent and location.

B2. Spatial Descriptions of Inter-regional, national frame (Sub-Frame 1)

Significant plans, studies and sources that informed the spatial specific selection of frame elements include, amongst others:

- Africa Union Commission. (2015). Agenda 2063: The Africa We Want.
- United Nations. 2016. Habitat III. Quito. 17-20 October 2016.
- United Nations. 2015. Sustainable Development Goals.
- SADC. (2015). SADC Industrialization Strategy and Roadmap 2015 - 2063. Gabarone: SADC.
- Southern African Development Community. (2012). Regional Infrastructure Development Master Plan. Gabarone: SADC.
- The Presidency. National Spatial Development Perspective, 2006.
- Department of Co-operative Governance. 2016. Integrated Urban Development Framework. A new deal for South African Cities and Towns.
- Department of Co-operative Governance. 2018. *Localising the New Urban Agenda: South Africa Discussion Document*.
- Economic Development Department. 2011. The New Growth Path Framework.
- Selection of **priority corridors, harbours, ports and trade posts** as well as government investment areas (such as SEZs) and inter-regional corridors and networks as outlined in:

    - Damon, M. et al. 2014. Spatial Perspective in Support of the New Growth Path. Unpublished Report prepared for Economic Development Department;
    - Transnet, 2016. National ports plan 2016;
    - TRANSNET. (2016). 30-year Long-term Planning Framework (Chapter 4 Port Development Plan). Johannesburg:
    - TRANSNET Group; Department of Transport. 2015. National Transportation Plan. Department of Transport;
    - Amos, S. (2010). The role of South Africa in SADC regional integration: the making or braking of the organisation. *Journal of International Commercial Law and Technology*, 124-131;
    - Brand, A. 2017. The use of corridor development as a strategic and supporting instrument towards the development of national space economies. Potchefstroom: NWU (Unpublished Thesis – PhD); and
    - Brand, A. and Drewes, JE. 2018. Spatial Corridor Model (SCM) – structuring economic spaces in South Africa.

B3. Spatial Descriptions of Settlements Type (Sub-Frame 2)

B3.1 Significant Urban Regions and Cities

The NSDF spatial frame identifies the **urban-regions and cities** that are foreseen to play a critical role in (1) housing the South African population and (2) in the national economy and that require focussed intervention (see **Table A1**).

The three national **Urban Regions** (identified based on existing densities and size, current and projected future population growth (2050), the size and diversity of the economy and social and economic reach and inter-regional role), are:

- The **Gauteng Urban Region** (and surrounding cities in the urban-innovation belt);
- **Cape Town Urban Region** (extending towards surrounding urban clusters); and
- The **eThekwini Urban Region** (extending to functionally linked areas within iLembe, Ugu, uMgungundlovu Districts and Msunduzi City).

National Urban Nodes include existing and emerging cities identified to play a significant role in national and regional development, are:

- Nelson Mandela Bay Metropolitan region;
- Mangaung City Area;
- Mbombela City Area;
- Rustenburg City Area;
- Buffalo City Area;
- Polokwane City Area;
- Richards Bay Large Regional Centre; and
- Msunduzi City Area.

These urban regions and big cities, as priority national nodes on the urban network, and places within identified growth and transformation corridors, would need to play a critical role for consolidated urban livelihoods and facilitating a more sustainable and just national spatial settlement pattern as set out by the NSDF.

Selection criteria included the following considerations (for studies and references see B3.4):

- *Firstly,* the spatial extent and densities: High density settlement footprint, as well as surrounding functional region that include a network of linked polycentric urban nodes and surrounding 'satellite' towns, former spatially segregated township areas, dense rural settlements and urban social and economic services, characterised by intense socio-economic and daily commuting interaction. The CSIR Settlement Typology 2018 was used as basis for demarcation and calculation. The Town Area Typology is based on a spatial data and indicator framework designed to identify, track and compare regional and inter-regional spatial and settlement patterns and trends. The town area extent is based on the 'GAP Meso Frame' (2018 Update), an extensive series of spatial data indicators derived from StatsSA and verified to enable spatial trend analyses, and verified with the fine grained CSIR Settlement Footprint Layer, 2018 (based on SPOT Building Count, StatsSA Enumerator Areas and disaggregated socio-economic trend data up to 2011).
- *Secondly,* Indicators of size and growth: Population size and growth trends, as well as migration attraction indicators;
- *Thirdly,* indicators of economic size and growth, including total economic output, employment, economic sector specific size and growth trends;
- *Fourthly,* inter-regional and national gate-way functions and services provided, including: administrative functions, ports and trade and logistics, and indexes of economic diversity and regional economic functional-clustering in terms of international head offices, the financial sector and international tourism.

B3.2 National Network of Regional Development Anchors

The **national network of regional development anchors**, that play a key role in the surrounding rural regions were identified as:

Aliwal North	Jozini	Secunda
Barberton	Kokstad	Scottburgh/ Pennington
Beaufort West	Kuruman	Springbok
Burgersfort	Kroonstad	Swellendam
Bela Bela	Ladysmith	Standerton
Bethal	Lichtenburg	Thohoyandou
Bethlehem	Makopane/Mmabatho	Queenstown
Brits	Mossel Bay	Upington
Bushbuckridge	Oudtshoorn	Ulundi
Butterworth	Lephalale	Vredenburg
Calvinia	Lusikisiki Lydenburg	Vryheid
Clanwilliam	Makhado	Welkom
Cradock	Manguzi	Worcester
Dennilton/Siyabuswa	Matatiele	Vryburg
De Aar	Moorreesburg	
Ermelo	Musina	
Escourt	Paarl/Wellington	
George	Phalaborwa/Namakgale	
Grahamstown	Plettenberg Bay	
Groblersdal	Port	
Giyani	Shepstone/Margate	
Graaff-Reinet	Potchefstroom	
Harrismith	Pongola	
	Piet Retief	

Priority regional development anchors were identified from a wide range of existing and emerging towns, identified as towns that are, and could, fulfil a regional function within productive rural regions in support of national and regional development objectives.

The CSIR Town Typology was utilised as basis (See Table A2), to enable identification of regional settlement nodes. Selection criteria included the following considerations (for studies and references see B3.4):

- Firstly, the **location and spatial extent and densities include areas** (towns) of dense settlement footprints and surrounding functional settlement areas that include former spatially segregated township areas, and dense rural settlements. As outlined in Annexure A, the Town Area Typology is based on (1) a spatial data and indicator framework designed to identify, track and compare regional and inter-regional spatial and settlement patterns and trends ('GAP Meso Frame' (2018 Update) and (2) an extensive series of spatial data indicators derived from StatsSA, which was verified to enable spatial trend analyses. The spatial extent of towns was verified with the fine-grained CSIR Settlement Footprint Layer, 2018 (based on SPOT Building Count, StatsSA Enumerator Areas and disaggregated socio-economic trend data up to 2011).
- Secondly, **indicators of population and economic size and growth**: Population and economic size and growth trends, as well as migration attraction indicators; and
- Thirdly, the identification of **local and regional size and service reach** (including economic, administrative but also social service facility access) of towns within their **unique typographies and diverse development contexts**. This enabled identification of towns that might be smaller in size but do play a significant role in remote regions, or of growing nodes in dense rural settlement regions with limited access to larger cities and towns.

Identification of the NSDF national network of regional development anchors included **consideration of expected and projected regional**

trends and desired national spatial pattern. Given current spatial patterns a specific focus was placed on identification of emerging nodes to support national urbanisation (become the cities of the future) in the central, eastern and coastal transformation and development corridors.

Regional and rural typography, road distance and access analysis under conditions of improved rural connectivity and distance analyses assisted in identifying growth centres that can play the role of strategically located regional and rural development anchors as part of the Regional-Rural Development Model and act as spatial levers.

Provincial plans and strategic focus areas, as well as existing national investments such as Industrial Development Zones, Spatial Economic Development Zones, Agri-Hubs and Aqua focus areas were also taken into consideration in the identification process. Regional development anchor-selection was also informed by the network of towns that play strategic regional roles as identified on the basis of nationally comparative town profiles developed as part of the CSIR, 2018 Town Area Typology. The location of regional development anchors took into consideration key national transport routes and the relationship to the networks of Regional Service Centres and Service Towns identified. The latter are strategically located to act as government and economic service centres within the surrounding service hinterland areas, and act as attractors of urban consolidation. Service Towns (CSIR Settlement Typology, 2018) form the bulk of the identified Rural Service Centres.

B3.3 Identification of regional networks of consolidated and well-connected rural service centres

Rural service centres (see **Table A1** below) across South Africa were identified to provide a select network of towns that play a strategic regional service role within their regions. They were identified on the basis of (1) the CSIR, 2018 Town Area Typology, (2) regional accessibility, and (3) recently developed priority towns for social investment within the DRDLR Rural Social Facility Toolkit project.

The town area typology is also being used in the identification of potential regional roles for medium and small towns in support of SALGA's Small Town Regeneration Strategy. Furthermore, the role of towns informs the Integrated Urban Development framework Implementation: SALGA Small Town Strategy. Identified points of growth and/or existing development should act as points of settlement consolidation in rural areas especially in areas of high value agricultural and ecological infrastructure.

B3.4 Significant plans, studies and sources that informed the spatial specific selection of frame elements

- Department of Co-operative Governance. 2016. Integrated Urban Development Framework. A new deal for South African Cities and Towns.
- Department of Co-operative Governance. 2018. *Localising the New Urban Agenda: South Africa Discussion Document*.
- Economic Development Department. 2011. The New Growth Path Framework.
- National Planning Commission. 2012. National Development Plan, 2030. Our Future – make it work.
- National Department of Human Settlements. (2015). Towards a Policy Foundation for the Development of Human Settlements Legislation.

- National Treasury, City Support Programme. (2012). CSP Framework. National Treasury.
- Department: Planning, Monitoring and Evaluation. 2017. Research on the Limited Success of Entrepreneurial Activity by Locals in Townships and Rural Areas. Seven Dialogue Locations: Townships, Rural and Informal Settlement. Research Report conducted for Programme Four: National Planning Commission. October. 2017.
- Report of the High-Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change. (2017). Page 32.
- Commission on the Restitution of Land Rights. (2014/15). Strategic Plan. CRLR.
- DRDLR. (2011). Green Paper on Land Reform.
- African National Congress. (2012). Land Reform Policy Discussion Document. Johannesburg: ANC.
- Department of Energy (DOE). 2015. State of Renewable Energy in South Africa. [Online] available at: http://www.gov.za/sites/www.gov.za/files/State%20of%20Renewable%20Energy%20in%20South%20Africa_s.pdf.
- Department of Environmental Affairs (DEA). n/d. About the green economy. [Online] available at: https://www.environment.gov.za/projectsprogrammes/greeneconomy/about.
- Renewable Energy Independent Power Producer Procurement Programme (REIPPP) - http://www.energyintelligence.co.za/reippp-all-you-need-to-know/
- Renewable Energy Development Zones (REDZ) - https://egis.environment.gov.za/renewable_energy
- Department of Water and Sanitation (DWS). (2017). Draft National Water Plan, DWS (2017: 40-41).

Guidance regarding national urbanisation patterns, nodes and corridors was provided by a range of policies and spatially explicit national plans, initiatives and strategies, including:

- Current *metropolitan, city and secondary cities* (SOCR, 2016; SACN Secondary Cities Work);
- *Existing urban densities and size of population and economy in functional urban regions* (city areas) and cities on the basis of nationally comparative town profiles developed in the CSIR, 2018 Town Area Typology.
- *Network of cities with international gateway functions* as identified using the EU International Gateway Indicators (see Matfield et al. 2014 and EDD, 2014 and EU, 2014). These primarily consider:
  - Projected urbanisation and population growth;
  - International and national trade, logistic centres (land, sea and air ports);
  - Mining, manufacturing and industrial centres;
  - Gateway functions as government services, provincial capitals and education centres;
  - Knowledge economy and research centres;
  - Service economy and green economy size and opportunities; and
  - International tourism nodes,
- *NSDF Spatial vision and settlement pattern scenario based re-modelling of regional patterns of projected urban population distribution* (CSIR, 2018. NSDF Vision Settlement Population Growth Projection).
- SADC. (2015). SADC Industrialization Strategy and Roadmap 2015 - 2063. Gabarone: SADC.
- Southern African Development Community. (2012). Regional Infrastructure Development Master Plan. Gabarone: SADC.

- Selection of *regional growth centres* considered regions envisioned to facilitate national urbanisation (central, eastern and coastal regions), and identified growth and development corridors. (See Frame 1.2 and 1.3).
- The *Integrated Urban Development Framework Implementation: 37 Intermediary City Municipalities* are also expected to play a key role as future urban regions, cities and regional anchor towns in NSDF Spatial Scenario.
- Department of Human Settlements Spatial Master Plan (guiding land release and investment through the Housing Development Agency)
- International journal of urban and regional research, still to be published.Cilliers, J. 2018. Made in Africa: Manufacturing and the Fourth Industrial Revolution. Institute of Security Studies. In Africa and the Wolrd Report. April. 2018
- Council for Scientific and Industrial Research. (2016). Settlement design guidelines for climate change adaptation in South Africa. CSIR. Pretoria: CSIR.
- Snowball, Collins and Tarentaal. (2016). Transformation and job creation in the cultural and creative industry in SA, SACO.
- South African Cities Network (SACN). (2014). *Outside the core: Towards and understanding of Intermediate Cities in South Africa*. South African Cities Network: Johannesburg.
- South African Cultural Observatory (SACO). (2016). The Role of Cultural and Creative Industries in Regenerating Urban and Rural Space and Economies in South Africa: A case Study Approach. Submitted to the Department of Arts and Culture.
- South African Cultural Observatory (SACO). (2016).The mapping of the South African creative economy: A baseline. Submitted to the Department of Arts and Culture.
- South African Cultural Observatory (SACO). (2017). Macroeconomic impact assessment and analysis of South Africa's cultural and creative industry (CCI) and creative. Submitted to the Department of Arts and Culture.
- Southern African Development Community (SADC). (2012). Regional Infrastructure Development Master Plan. Gabarone: SADC
- Southern African Development Community (SADC). (2015). SADC Industrialization Strategy and Roadmap 2015 - 2063. Gabarone: SADC.
- South African National Biodiversity Institute (SANBI). (2016). Framework for Investment in Ecological Infrastructure.
- Selection of *priority corridors, harbours, ports and trade posts* as well as government investment areas (such as SEZs) and inter-regional corridors and networks as outlined in:
  - Transnet, 2016. National ports plan 2016;
  - TRANSNET. (2016). 30-year Long-term Planning Framework (Chapter 4 Port Development Plan). Johannesburg:
  - TRANSNET Group; Department of Transport. 2015. National Transportation Plan. Department of Transport;
  - Amos, S. (2010). The role of South Africa in SADC regional integration: the making or braking of the organisation. *Journal of International Commercial Law and Technology*, 124-131.
  - Brand, A. 2017. The use of corridor development as a strategic and supporting instrument towards the development of national space economies. Potchefstroom: NWU (Unpublished Thesis – PhD);
  - Brand, A. and Drewes, JE. 2018. Spatial Corridor Model (SCM) – structuring economic spaces in South Africa.

Spatial analyses informing the selection of *regional development anchors and service centres,* included:

- Rural regional anchors and service centres was identified based on a network of towns with strategic regional roles as identified on the basis of nationally comparative town profiles developed in the CSIR, 2018 Town Area Typology. The town area typology is also

used for the identification of potential regional roles for medium and small towns in support of SALGA's Small Town Regeneration Strategy. The role of towns informs the Integrated Urban Development Framework Implementation: SALGA Small Town Strategy;

- SA CSIR MesoZone 2018v1 Dataset: Available at http://stepsa.org. Available at http://stepsa.org see http://stepsa.org/socio_econ.html#Indicator

Data was used from the following provincial SDFs in the analyses done in compiling the Draft NSDF and the proposals put forward in the framework:

- KwaZulu-Natal, Provincial Growth & Development Plan, 2018;
- KwaZulu-Natal, Provincial Growth & Development Strategy, 2016;
- Eastern Cape, Provincial Spatial Development Plan, 2010;
- Free State, Provincial Spatial Development Framework, 2014;
- Gauteng, Provincial Spatial Development Framework, 2017;
- Limpopo, Provincial Spatial Development Framework, 2016;
- Mpumalanga, Provincial Spatial Development Framework, 2013;
- Northern Cape, Provincial Spatial Development Framework, 2012;
- North West, Provincial Spatial Development Framework, 2016; and
- Western Cape, Provincial Spatial Development Framework, 2014.

Table A1: Description of current and growing urban regions and urban cores as a basis for envisaged NSDF settlement vision.

NATIONAL URBAN REGIONS AND NODES

NSDF national urban regions, cores and nodes have been identified on the basis of existing and projected high growth these include **1. City regions**, **2. Cities and large regional centres** and a select few **3. Regional service centres**, as defined in the CSIR, South Africa Functional Town Typology – 2018. These areas will be home to the majority of the population in future. Based on the NSDF Vision they are expected to house 61% of the country's 2050 population (CSIR, 2018. NSDF Vision Settlement Population Growth Projection).

URBAN REGIONS **Population**:> 3 million people AND **Economic output** > R40 816 mill/yr (2013 - *Metros/International Gateways with continuing significant population and economic share.*		**NATIONAL URBAN CORES** **Cities:** Population: >500 000 and Economic output >R7 900mill/yr (2013),	**SMALLER URBAN CORES** **Very Large Regional Centres**: Population: >300 000 and Economic output >R4 000mill/yr (2013) **Large Regional Centres**: Population: >100 000 and Economic output >R1400mill/yr (2013)
Greater Gauteng Urban Region	Ekurhuleni Metro; City of Johannesburg City of Tshwane Metro and Functionally linked areas in West Rand, Sedibeng; Bojanala, Fezile Dabi and Nkangala DM	Nelson Mandela Bay Metropolitan region Mangaung City Area Mbombela City Area Rustenburg City Area Buffalo City Area Polokwane City Area Richards Bay Large Regional Centre Msundusi City Area	Newcastle Large Regional Centre Tzaneen Large Regional Centre Emalahleni (Middleburg)Large Regional Centre Matlosana Large Regional Centre
Greater Cape Town Urban Region	City of Cape Town and Functionally linked areas in Stellenbosch Cape Winelands DM and West Coast DM		**Regional Service Centres**: Population: >100 000 and Economic output >R1100mill/yr (2013)
Greater eThekwini Urban Region	eThekwini Metro and Functionally linked areas in iLembe, Ugu and Umgungundlovu Districts, up to the Msunduzi City		Sol Plaatje Mthatha e

Table A2: Description of current settlement network as a basis for envisaged NSDF national network of Regional Development Anchors

Regional Development Anchors

NSDF national network of regional development anchors have been identified on the basis of expected and projected high growth Regional Service Centres and Service Towns that are strategically located. The basis has been the network of Regional Growth Centres and significant Service Towns within the CSIR, South Africa Functional Town Typology – 2018.

Regional Growth Anchors are made up of Regional Service Centres and a selection of regionally significant and accessible Service Towns. Selection of the service towns considered formal economy and population growth.

Population variation between 15 000 to just over 100 000 people and economic output >R270mill (2013)

Expected to house 14% of the country's 2050 population (CSIR, 2018. NSDF Vision Settlement Population Growth Projection).

REGIONAL SERVICE CENTRES		SERVICE TOWNS	
Bela Bela	Mmabatho	Aliwal North	Lydenburg
Bethal	Mossel Bay	Barberton	Makhado
Bethlehem	Oudtshoorn	Beaufort West	Manguzi
Brits	Paarl/Wellington	Burgersfort	Matatiele
Bushbuckridge	Scottburgh/ Pennington	Calvinia	Moorreesburg
Butterworth	Phalaborwa/Namakgale	Clanwilliam	Musina
Dennilton/Siyabuswa	Port Shepstone/Margate	Cradock	Piet Retief
Ermelo	Potchefstroom	De Aar	Plettenberg Bay
Escourt	Queenstown	Giyani	Pongola
George	Secunda	Graaff-Reinet	Springbok
Grahamstown	Standerton	Harrismith	Swellendam
Groblersdal	Thohoyandou	Jozini	Ulundi
Kroonstad	Upington	Kokstad	Vryburg
Ladysmith	Vredenburg	Kuruman	
Lichtenburg	Vryheid	Lephalale	
Makopane	Welkom	Lusikisiki	
	Worcester		

Table A3: Description of current settlement network as a basis for envisaged regional networks of Rural Service Centres.

<table>
<tr><td colspan="2">Rural Service Centres
This group consists of service towns, small service towns and settlements

Population: Varies in nodal settlement, large population in direct hinterland

Expected to house 5% of the country's 2050 population. (CSIR, 2018. NSDF Vision Settlement Population Growth Projection).</td></tr>
<tr><td colspan="2">E.G. Middelburg EC, Mtubatuba, Barkley East, Bizana etc. See next page for detail list.</td></tr>
<tr><td>Other Settlements</td><td>This category includes the rest of the towns and settlements which were not included in the above categories and incorporates: small towns, dense rural and spare settlements with the following characteristics.

Population: Less than 20 000 people in town itself. Even less population hinterland being either dense/sparse rural hinterland.

Excepted to house 20% of the country's 2050 population</td></tr>
<tr><td>E.G. Hogsback, St Helena Bay, Tabankulu, Thornhill, Hofmeyer, etc.</td><td>See stepSA.co.za for a separate list for a full list of 346 towns and settlements.</td></tr>
</table>

Rural Service Centres Table A3 cont.					
Aberdeen	Creighton	Hartswater	Laingsburg	Nongoma	Stanger
Acornhoek	Dalton	Harding	Lamberts Bay	Noupoort	Steinkopf
Adelaide	Darling	Heidelberg-WC	Leandra	Nqamakwe	Stella
Allanridge	De Rust	Heilbron	Lebowakgomo	Nqutu	Sterkspruit
Amersfoort	Dealesville	Hendrina	Libode	Ntambanana	Steynsburg
Amsterdam	Delareyville	Hennenman	Lillydale	Nwamitwa	Stutterheim
Ashton	Delmas	Hermanus	Lindley	Ogies	Swartruggens
Babanango	Dendron/Dikgale	Hertzogville	Lorraine	Olifantshoek	Tarkastad
Balfour	Dewetsdorp	Highflats	Lothair	Ottosdal	Taung
Barkley-West	Dimbaza	Himeville	Louwsburg	Ozwathini	Thabazimbi
Barkley East	Diphuti	Hlabisa	Mabeskraal	Parys	Theunissen
Barrydale	Dordrecht	Hluhluwe	Maclear	Paterson	Trompsburg
Bathhurst	Douglas	Hoedspruit	Madibogo	Paul-Pietersburg	Tshaulu
Belfast	Driekop	Hoopstad	Magatle	Peddie	Tshipise
Bergville	Driekoppies	Hopetown	Malmesbury	Penge	Tugela Ferry
Bethulie	Dullstroom	Idutywa	Mandini	Petrus Steyn	Tweespruit
Bizana	Dundee	Indwe	Marquard	Petrusburg	Umphumulo
Bloemhof	Edenville	Ingwavuma	Mbazwana	Petrusville	Umzinto
Blouberg	Ekuvukeni	Isithebe	Melmoth	Phondweni	Utrecht
Bochum	Elliotdale	Itsoseng	Memel	Piketberg	Vaalkop
Bogalatladi	Engcobo	Ixopo	Middelburg (E.C.)	Port Alfred	Vaalwater
Boshof	Engonyameni	Iziqolweni	Mkuze	Port Nolloth	Ventersdorp
Bothaville	Eshowe	Jamestown	Modimolle	Port St Johns	Venterstad
Brandfort	Exelsior	Jane Furse	Mogwase	Postmasburg	Victoria West
Bredasdorp	Ficksburg	Jansenville	Molteno	Prieska	Viljoenskroon
Britstown	Flagstaff	Jeffreys Bay	Montagu	Prince Albert	Villiers
Bultfontein	Fort Beaufort	Joubertina	Mooirivier	Raditshaba	Volksrust
Bulwer	Fouriesburg	Kakamas	Mookgophong	Rebone	Vrede
Burgersdorp	Frankfort	Kamaqhekeza	Morgenzon	Reddersburg	Vredefort
Cala	Franschhoek	Kathu	Morokweng	Reitz	Vredendal
Caledon	Ga-Kgapane	Kei Mouth	Moruleng	Richmond (KZN)	Warden
Carnarvon	Ga-Mafefe	Keiskammahoek	Mosate	Richmond (NC)	Warrenton
Carolina	Ga-Mmabasotho	Kestell	Motswedi	Riebeek West	Weenen
Cathcart	Ga Pila	Kirkwood	Mount Ayliff	Ritchie	Wepener
Centane	Ganyesa	Knysna	Mount Frere	Riversdale	Wesselsbron
Ceres	Gcwalemini	Koffiefontein	Mphakane	Riviersonderend	Willowmore
Ceza	Genadendal	Komatiepoort	Mpheni	Robertson	Willowvale
Christiana	Grabouw	Koppies	Mtubatuba	Rockcliff	Winburg
Citrusdal	Greytown	Koster	Murraysburg	Roossenekal	Wittlesea
Clocolan	Griekwastad	Kranskop	Mutale	Rouxville	Wolmaransstad
Clydesdale	Groblershoop	Kriel	Nababeep	Sabie	Wolseley
Coffee Bay	Ha-Mandiwana	Kwakhawula Ladismith	Ndumu	Schweizer-Reneke	Xawela
Cofimvaba	Hankey	Lady Frere	Ngodwana	Senekal	Xitlhtlani
Colesberg	Hartbeesfontein (NW)	Lady Grey	Ngqeleni	Seymour	Zastron
Coligny	Hartbeesfontein-A (NW)	Ladybrand	Nhlazartshe	Smithfield	Zeerust T
	Hartebeesfontein (LIM)		Nkandla	Somerset East	

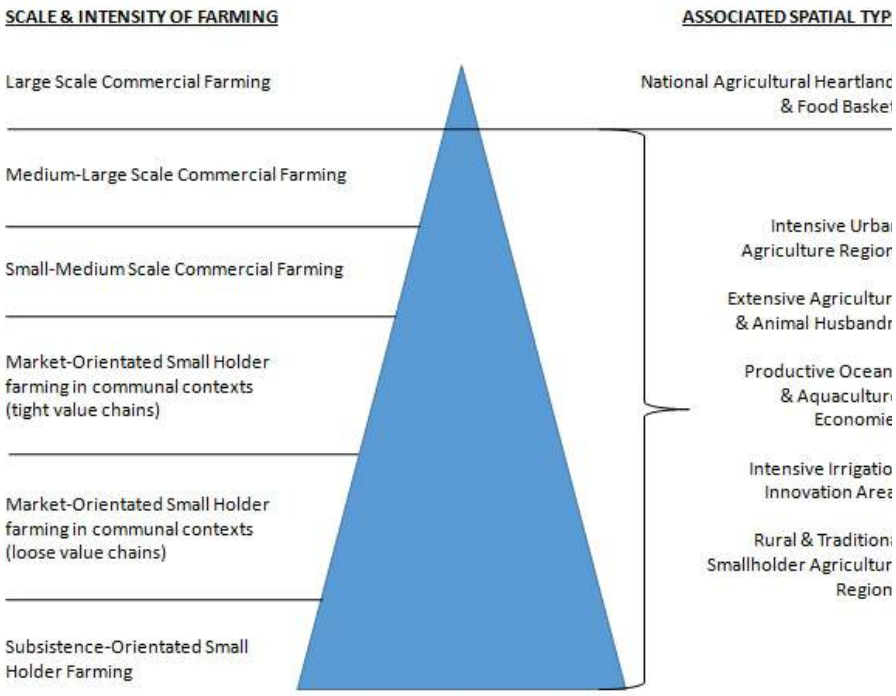
B4. Spatial Logic for Natural Resource Production and Selection Resource Production areas (As used in NSDF Sub-Frame 3)

B4.1 Spatial Logic

Central to the spatial logic of the National Resource Production Regions Sub-Frame 2 are the following:

- Maintenance of national agricultural heartlands in the interests of national food security;
- The prioritisation of lower order agricultural development areas that exhibit greater cumulative levels of spatial advantage in terms of:
  - Agricultural productivity, crop suitability and viability;
  - Proximity to existing consumption and production chains;
  - Accessibility to higher order settlement typologies;
  - Accessibility to supporting agricultural infrastructure;
  - High population densities;
  - Effective agricultural development through agrarian and land reform will require recognition of and concerted efforts around the following:
    - Realigning and combining models of agrarian and land reform at a policy level;
    - Defining the role of land reform as an instrument to facilitate land access and security of tenure for agricultural development;
    - Optimising the role of stakeholder-based land reform;
    - Steering land reform policy towards boosting productive land use among the rural poor;
    - Renewing the emphasis on 'transformation-from-below' for widespread grassroots impact on poverty and unemployment;
    - Facilitating the conversion of underutilized land in communal areas into small scale and/or commercial production;
    - Incorporating indigenous knowledge systems for agriculture in traditional areas in a way that factors traditional spatial relationships between settlement and agricultural practice;
    - Using a spatial targeting approach that factors in the contextual and comparative advantages of region and place;
    - Picking and supporting commercial agriculture sectors and regions that have the highest potential for growth and employment;
    - Focusing on strategic agricultural development areas where expanded irrigation is possible through improved water management and new water schemes;
    - Focusing support on agricultural development areas that have a comparative advantage in terms of proximity and access to production and consumption chain networks, e.g. Regional Development Anchors, Rural Service Centres; and
    - Providing strategic developmental support for potential new production and consumption chains in dense rural hinterlands.

Figure A8: Viable small scale farming and transformation from below as key input in shaping significant "agri-enterprise resource regions"



B4.2 Spatial Description of Production Heartland, Agri-Enterprise Regions and Eco-Resource Production Regions (as used in NSDF Sub-Frame 3)

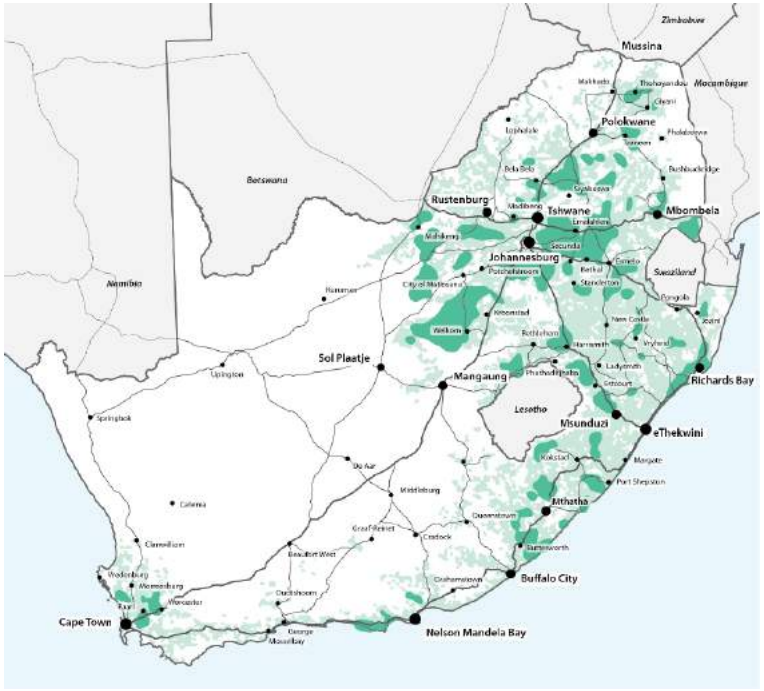
Resource Production Heartland Areas

The frame firstly refers to a central "Heartland" which includes all identified high value production and high potential agricultural land in the central part of the country (as used in Figures 9 and 14 of the main NSDF document and seen in Figure A8 and A9 below). This region is also characterised by high intensity mining production in selected areas.

The agricultural area is identified based on the following inputs: (1) a crop fields layer from the National Department of Agriculture, and (2) the Land Capability data (2018), provided by the National Department of Agriculture.

Crop fields with a land capability index value of 8 and more were selected to represent intermediate to high value agriculture land in the country. The National Department of Agriculture's process of updating this data layer, was used to guide the demarcation of the high value production areas (see **Figure A9**).

Figure A9: High Value Agriculture Areas in Central Heartland and Agri-Enterprise Regions (Land Capability Layers considered as input)



Source: Department of Agriculture, 2018.

Agri-Enterprise Resource Regions

These are identified areas of high and moderate land capability found in, dense settlement areas with water availability and that have high potential for agri-resource enterprise development (see **Figure A9**).

The selection of these areas once again considers (1) crop fields data from the National Department of Agriculture, and (2) Land Capability data (2018) provided by the National Department of Agriculture. Crop fields with a Land Capability Index Value of 8 and more were selected to represent intermediate to high value agriculture land in the country.

The identification of Agri-Enterprise Opportunity Areas shown in **Figure 18** of the **Draft NSDF 2019** considers a number of factors, such as current productive land, (currently cultivated), as well as market access to densely settled and new growth areas. These are considered as key indicators for identifying potential sites for small scale farming schemes close to markets and with good agricultural potential.

The selection of suitable sites for small scale farming thus considered the following criteria and factors:

- High potential agricultural land based on land capability;
- Agriculture infrastructure in existence or planned;
- High priority was given to planned Agri-hubs and agro-processing facilities, proximity to fresh produce markets and other processing facilities;
- Proximity to cities and identified growth regions were of utmost importance with respect to the sustainability of small scale farming. Factors considered amongst others proximity of social facilities such as schools, health facilities and social support services;
- Availability of sources of water, e.g. located downstream from existing dams to ensure good gravity feed;
- Areas where Land Reform and Agriculture Development (LRAD) programs cluster in proximity; and
- Only areas with slopes of less than 6% were selected.

Cognizance should be taken of the broad spectrum of agricultural activity in South Africa, and the need for differentiated responses at each level. Levels of agricultural activity in this regard are represented in the pyramid on the following pages. This spectrum of agricultural activity is categorised according to scale and intensity of production, ranging from large commercial producers at the peak to smaller scale producers towards the base.

Key to the approach considered is a small-scale farming model, indicative of a 'transformation-from-below' approach; one that is espoused by a variety of specialists and academics on the topic of agrarian reform in South Africa. A potentially renewed emphasis on transformation-from-below for agrarian reform will require a spatially differentiated and targeted approach that factors both contextual and comparative advantages of region and place (Figure A9). Viable small scale farming and transformation from below was thus a key input in shaping and identifying significant "agri-enterprise resource regions"

Spatial Description of Natural -Resource Production and Livelihood Regions

There are areas that need to play a key role in resource economies as well as management of national ecological infrastructure – with specific land-development and management implications.

These are areas that are nationally significant for ecological as well as "resource critical regions" for other purposes such as mining, agriculture, energy, settlements, heritage and tourism areas.

The areas are typically under stress from an ecological perspective. They are under pressure in terms of their resilience, but also in terms of the impact of development and risk to critical biodiversity areas (CBA1) and associated ecological service areas such as Strategic Water Source Areas (SWSA).

The Resource Production and Livelihood Regions are characterised by the prominence of Strategic Water Service Areas (SWAs), which contribute significantly to the overall water supply of the country – not merely to the region itself.

These areas are our water factories, supporting growth and development needs that are often a long distance from the SWSAs themselves. Land uses that reduce stream flow or affect water quality (e.g. mining, sprawling settlements, plantations, overgrazing) should be avoided in SWSAs; wetlands should be kept in good condition or rehabilitated, and invasive alien plants should be cleared.

The areas provide unique opportunities for agri-enterprises, eco-enterprises, and activities including small scale arming, wildlife ranching, marine economies, tourism and restoration related job creation opportunities.

B4.3 Significant plans, studies and sources that informed the spatial specific selection of frame elements

Guidance for national ecosystem and resource regions was provided by a wide range of policies and plans and spatially explicit national plans, initiatives and strategies, including:

- Department of Agriculture: Considering (1) crop fields from the National Department of Agriculture and (2) land capability 2018 from the National Department of Agriculture;
- Land Capability and Agriculture Production (StatsSA, Quantec, CSIR Mesozone, 2017) Department of Agriculture, RSA. 2014. Land capability (Dataset);
- Department: Planning, Monitoring and Evaluation. 2017. Research on the Limited Success of Entrepreneurial Activity by Locals in

Townships and Rural Areas. Seven Dialogue Locations: Townships, Rural and Informal Settlement. Research Report conducted for Programme Four: National Planning Commission. October. 2017;
- Report of the High-Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change. (2017). Page 32;
- Commission on the Restitution of Land Rights. (2014/15). Strategic Plan. CRLR;
- DRDLR. (2011). Green Paper on Land Reform;
- African National Congress. (2012). Land Reform Policy Discussion Document. Johannesburg: ANC;
- Department of Energy (DOE). 2015. State of Renewable Energy in South Africa. [Online] available at: http://www.gov.za/sites/www.gov.za/files/State%20of%20Renewable%20Energy%20in%20South%20Africa_s.pdf;
- Department of Environmental Affairs (DEA). n/d. About the green economy. [Online] available at: https://www.environment.gov.za/projectsprogrammes/greeneconomy/about;
- Renewable Energy Independent Power Producer Procurement Programme (REIPPP) - http://www.energyintelligence.co.za/reippp-all-you-need-to-know/;
- Renewable Energy Development Zones (REDZ) - https://egis.environment.gov.za/renewable_energy;
- Department of Water and Sanitation (DWS). (2017). Draft National Water Plan, DWS (2017: 40-41);
- Transnet, 2016. National ports plan 2016;
- TRANSNET. (2016). 30-year Long-term Planning Framework (Chapter 4 Port Development Plan). Johannesburg;
- Transnet. 2015. Transnet Freight Rail: Road to Rail Strategy Progress: June 2015. Presentation to the Parliamentary Committee on Public Enterprises, Cape Town, South Africa;
- Department of Transport (DoT). 2013. National Household Travel Survey datasets. Pretoria, South Africa;
- Department of Water and Sanitation. National Water and Sanitation Master Plan. Draft 2.6. 2017;
- Department of Transport (DoT). 2015. National Transport Master Plan 2050. Pretoria, South Africa;
- Strategic National South African Infrastructure network and plans, including: IDZs, SEZs, Strategic freight, heavy haul and passenger railway networks, Road network and Ports;
- Green energy suitability – 2017 EGIS data (https://egis.environment.gov.za/) available from the Department of Environmental Affairs. It was processed by CSIR to create areas of focus (2017);
- Hydro Electricity, hydro-electricity, biomass electricity and co-generation electricity, and coal fired power generation sites, provided by ESKOM 2017;
- Settlement data, provided by the Department of Water Affairs, 2017;
- Electricity Grid and Coal Fired Power Stations, Eskom 2017;
- Pipeline Networks, NATMAP;
- Coal resource areas, Council for Geo-Science;
- Renewable Energy Development Zones, as identified investment areas for renewable energy resource investment;
- Ports Regulator of South Africa (PRSA). 2015. South African port capacity and utilisation report 2015/16. Accessed 06 July 2016 at www.portsregulator.org;
- Department of Environmental Affairs. SEA: National corridors for Gas Pipeline corridor and Electricity Grid Infrastructure Extension, 2018;
- KwaZulu-Natal, Provincial Growth & Development Plan, 2018;
- KwaZulu-Natal, Provincial Growth & Development Strategy, 2016;
- Eastern Cape, Provincial Spatial Development Plan, 2010;
- Free State, Provincial Spatial Development Framework, 2014;
- Gauteng, Provincial Spatial Development Framework, 2017;
- Limpopo, Provincial Spatial Development Framework, 2016;

- Mpumalanga, Provincial Spatial Development Framework, 2013;
- Northern Cape, Provincial Spatial Development Framework, 2012;
- North West, Provincial Spatial Development Framework, 2016; and
- Western Cape, Provincial Spatial Development Framework, 2014.

The green energy infrastructure focus areas, for solar energy, wind energy and as identified in the renewable energy corridors, were considered as resource potential areas, as set out in the various Wind, Solar and Bio-Energy Atlases.

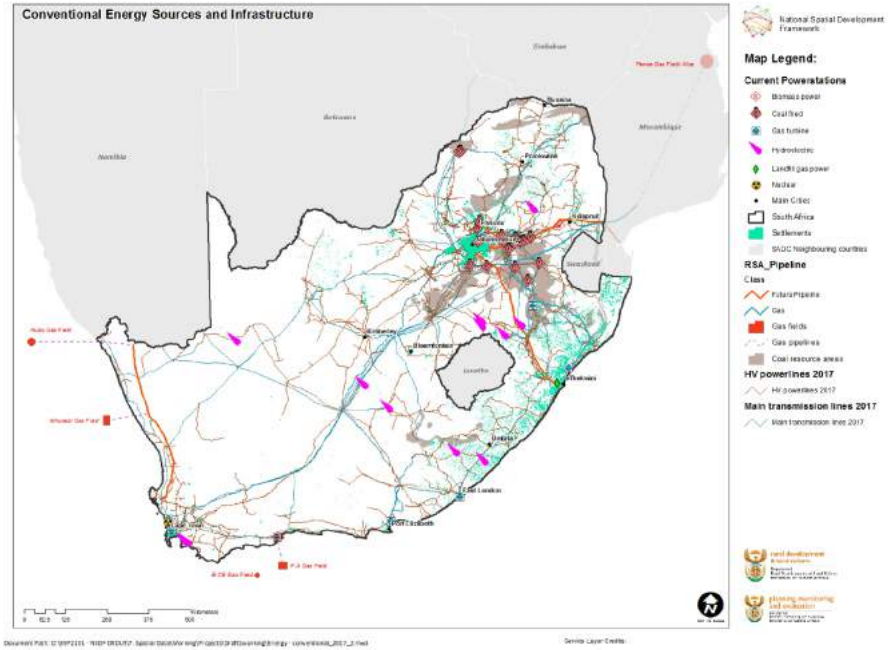
B5. Additional Spatial Descriptions for National Connectivity Network: NSDF Sub-Frame 4:

B5.1 Spatial illustration of national significant energy infrastructure as part of national connectivity network

Infrastructure network to support national energy flows from existing gas fields and coal resource areas, as well as an increased energy mix and existing national and regional networks, as well as current and future settlement patterns. The network infrastructure (see **Figure A10**) primarily consists of:

- Power generation and stations
- Coal fired power stations
- Hydroelectricity power-stations
- Gas turbines
- Nuclear power stations
- Bio-mass power
- Landfill gas power
- Transmission networks:
- Existing pipeline for crude oil and gas;
- Future pipeline for gas;
- Main transmission lines.

Figure A10: National Energy Infrastructure Network



Source: ESKOM, 2017.

B5.2 Significant plans, studies and sources that informed the spatial specific selection of frame elements

This is a wide and varied set, including:

- TRANSNET. (2016). 30-year Long-term Planning Framework (Chapter 4 Port Development Plan). Johannesburg;
- Transnet. 2015. Transnet Freight Rail: Road to Rail Strategy Progress: June 2015. Presentation to the Parliamentary Committee on Public Enterprises, Cape Town, South Africa;
- Department of Transport (DoT). 2013. National Household Travel Survey datasets. Pretoria, South Africa;
- Department of Water and Sanitation. National Water and Sanitation Master Plan. Draft 2.6. 2017;
- The NDP. 2011;
- Transnet, 2016. National ports plan 2016;
- Damon, M. et al. 2014. Spatial Perspective in Support of The New Growth Path. Unpublished Report prepared for Economic Development Department;
- KwaZulu-Natal, Provincial Growth & Development Plan, 2018;
- KwaZulu-Natal, Provincial Growth & Development Strategy, 2016;
- Eastern Cape, Provincial Spatial Development Plan, 2010;
- Free State, Provincial Spatial Development Framework, 2014;
- Gauteng, Provincial Spatial Development Framework, 2017;
- Limpopo, Provincial Spatial Development Framework, 2016;
- Mpumalanga, Provincial Spatial Development Framework, 2013;
- Northern Cape, Provincial Spatial Development Framework, 2012;
- North West, Provincial Spatial Development Framework, 2016;
- Western Cape, Provincial Spatial Development Framework, 2014;
- A Selection of **priority corridors, harbours, ports and trade posts** as well as government investment areas (such as SEZs) and inter-regional corridors and networks as outlined in:
  - Transnet, 2016. National ports plan 2016;
  - TRANSNET. (2016). 30-year Long-term Planning Framework (Chapter 4 Port Development Plan). Johannesburg:
  - TRANSNET Group; Department of Transport. 2015. National Transportation Plan. Department of Transport;
  - Amos, S. (2010). The role of South Africa in SADC regional integration: the making or braking of the organisation. *Journal of International Commercial Law and Technology*, 124-131.
  - Brand, A. 2017. The use of corridor development as a strategic and supporting instrument towards the development of national space economies. Potchefstroom: NWU (Unpublished Thesis – PhD); and
  - Brand, A. and Drewes, JE. 2018. Spatial Corridor Model (SCM) – structuring economic spaces in South Africa.

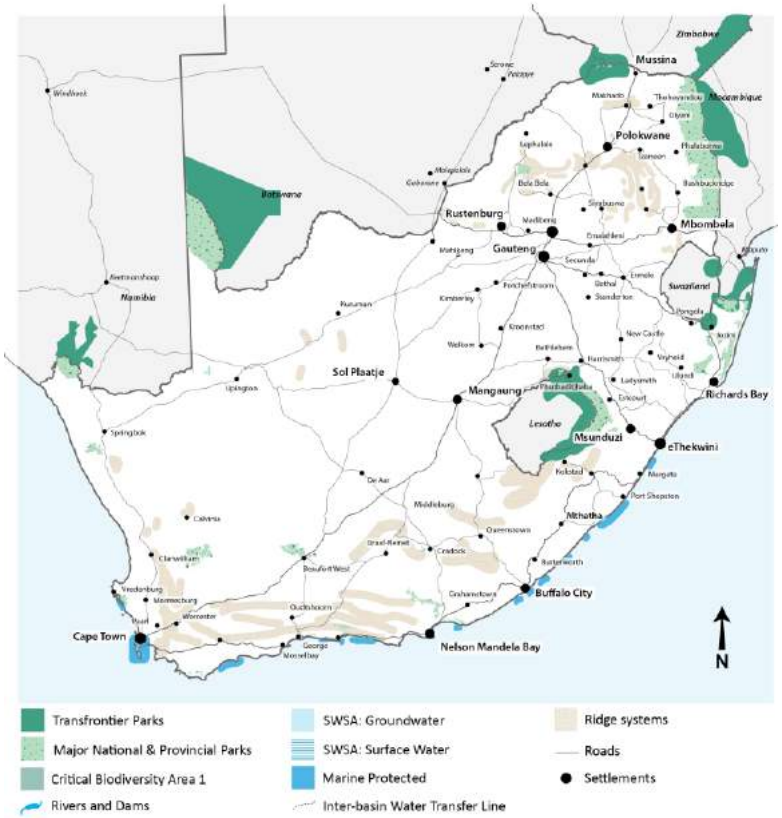
B6. Additional Spatial Descriptions for National Ecological Infrastructure Network and Natural Resource Base: NSDF Sub-Frame 5:

B6.1 Spatial Description of National Protect Areas

National Protected Areas as base for the ecological infrastructure includes:

- Official National and major Provincial Protected areas – Terrestrial and Marine protected areas;
- Transfrontier Parks;
- Biosphere reserves; and
- National Fresh Water Protected Areas (Water bodies).

Figure A11: Major National Protected Areas

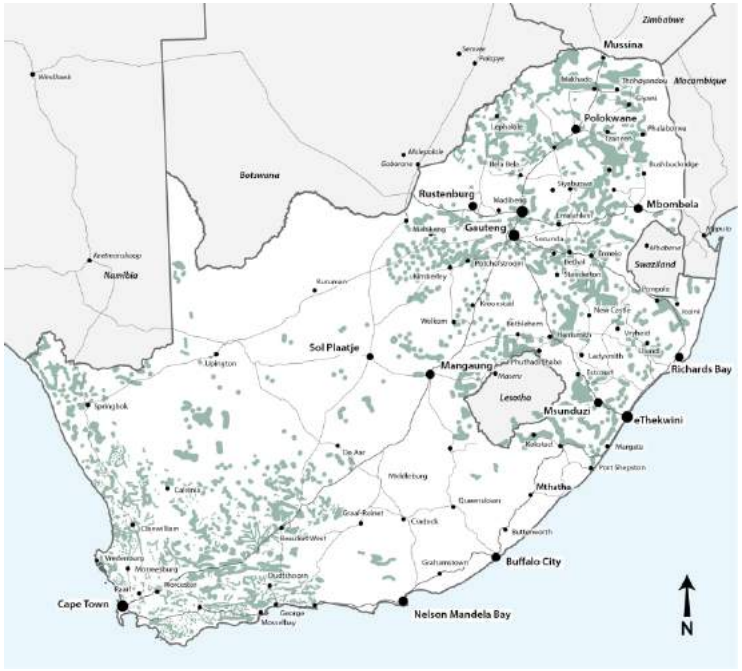


Source: SANBI, 2018.

B6.2 Spatial Description of National Protect Areas

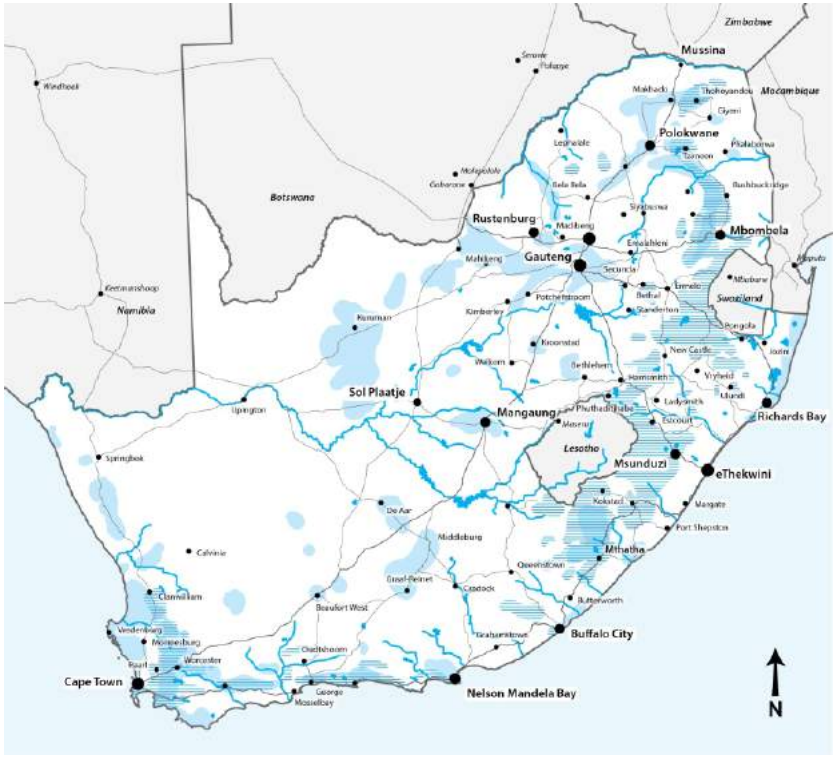
Management and productive use of Critical Biodiversity Areas (CBAs) (Figure A12) and Strategic Water Source (SWS) areas (Figure 12) and National Fresh Water Bodies (Figure 13) have been identified as Priority National Ecological Infrastructure Regions that are of national importance and development.

Figure A12: Critical Biodiversity Areas (CBA1)



Source: SANBI 2018.

Figure A13: Strategic Water Source Areas, National Fresh Water Bodies



Source: SANBI 2018.

The Strategic Water Source Areas (SWSAs) contribute significantly to the overall water supply of the country. They are identified in Atlas of Freshwater Ecosystem Priority Areas in South Africa (Nel et al, 2011). The World Wild Life Fund's 2015 report on SWSAs provide detail descriptions of individual SWSAs.

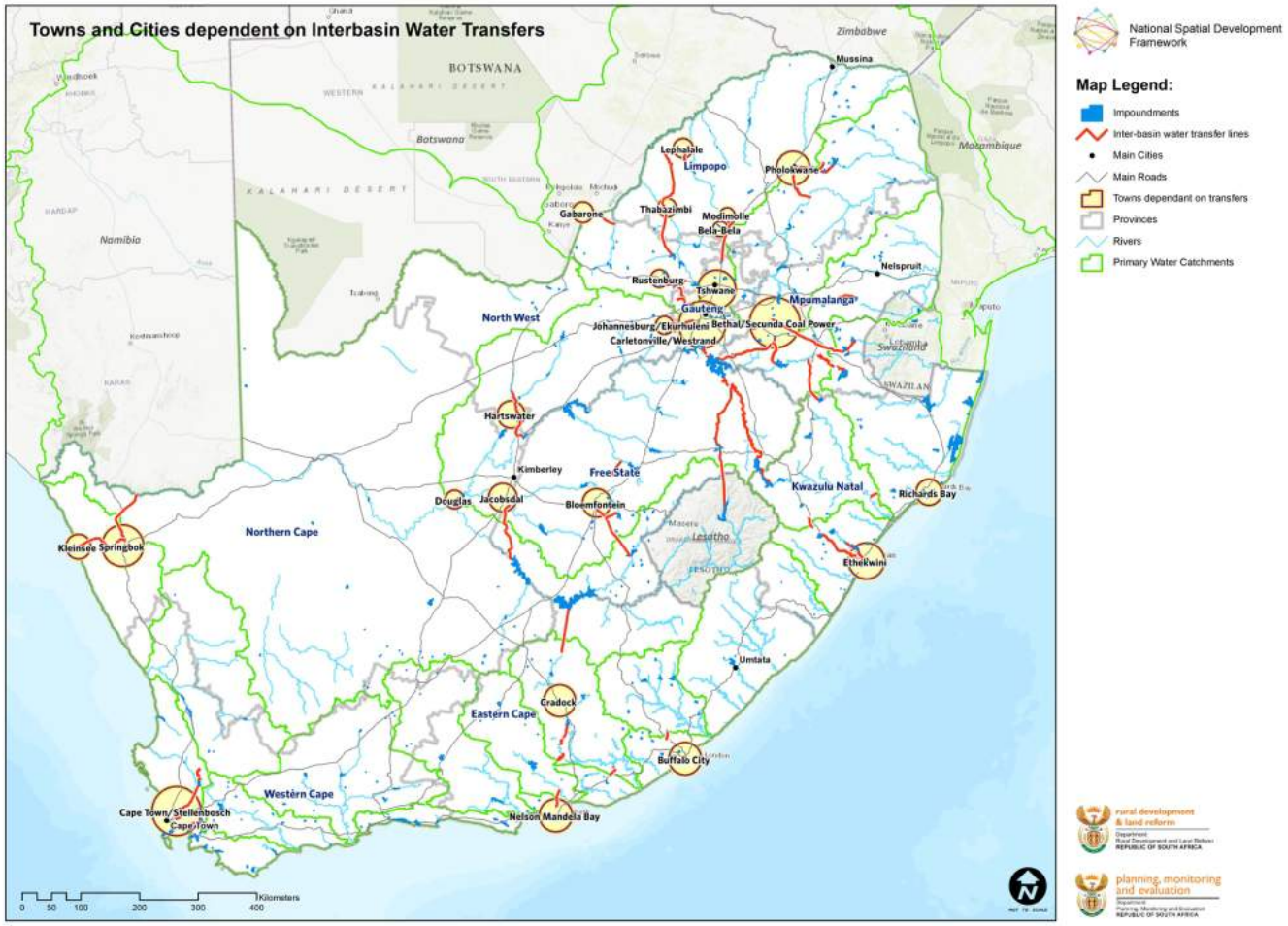
In the Southern and West Coast region and the Central heartland areas, these areas largely coincide with high productive agricultural, urban growth, mining activities and critical bio-diversity areas. Along the eastern coast and inland areas and in the north of the country, strategic water source areas have to be managed within productive agriculture, densely settled and also traditional settlement areas. Management of these areas needs to consider restoration, green enterprise and service delivery, tourism and game farming activities. Strategic Groundwater Areas in the central and arid regions are critical for many towns that are dependent on scarce groundwater sources.

The system of National Fresh Water Bodies and management guidelines is set out in the Implementation manual for freshwater ecosystem priority areas (see Driver A., Nel JL., Snaddon K., Murray K., Roux DJ., Hill L., Swartz ER., Manuel J. and Funke N. (2011) Report No. 1801/1/11, Water Research Commission, Pretoria).

B6.3 Spatial Illustration of Significant Inter-Basin Water Transfer Lines

Nationally significant inter-basin water transfer lines and dependent cities were identified and indicated as can be seen in **Figure A13**.

Figure A13. Significant *Inter-Basin Water Transfer Lines as used in Figure 42 in main document*



Source: Transfers captured through spatial analysis and enquiry Mandala GIS, 2018.

B6.4 Additional Spatial Description of *National Resource Risk Areas* (NSDF Sub-Frame 5)

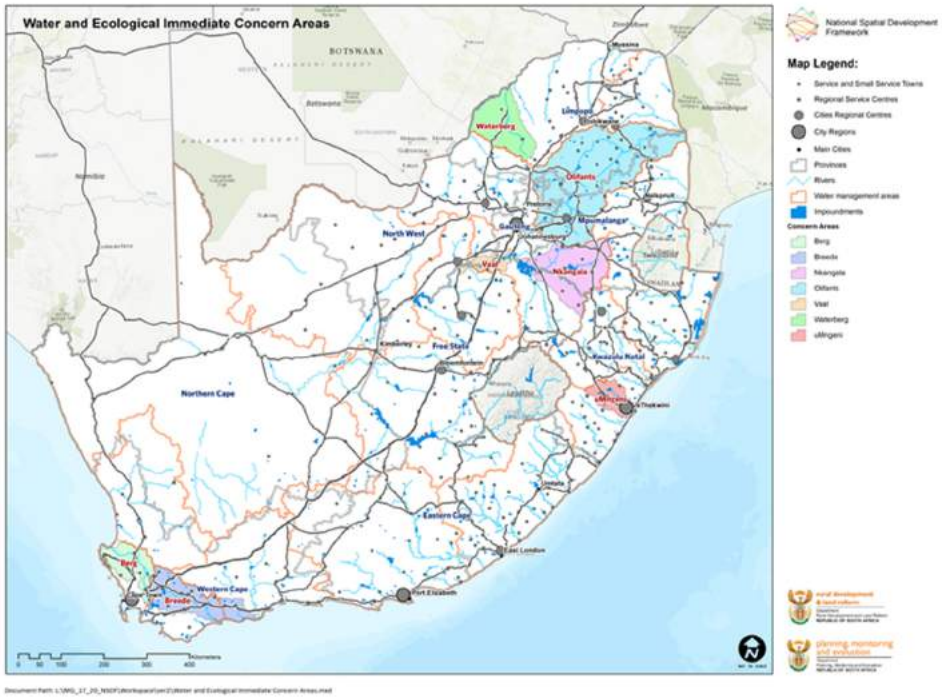
National resource risk areas (see **Figure A14**) are both (1) nationally significant and (20 under stress from an ecological perspective, but are also "*resource critical regions*" for other sectors such as mining, energy, agriculture and human settlement. These areas are under pressure in terms of their resilience, but also in terms of the impact of development and risk to **Critical Biodiversity Areas** (CBA1) and associates ecological service areas as well as high quality water production.

Priority Focus Areas: Stressed Catchments with densely populated Strategic Water Source Areas

Strategic Focus Areas: The risks associated with interregional interdependencies are clearly evident in significant national scale ecological core "*competition areas*", which in general show high levels of pollution. The critical areas for short term intervention in this regard are in the:

- Upper Vaal region (Mpumalanga) (SWSA, coal mining, high potential agricultural land);
- Lower Vaal (Gauteng, Free State) (SWSA, water supply for Gauteng, coal mining, industry, high potential agricultural land and expanding settlements);
- Greater uMngeni region (KZN) (water supply for Ethekwini, intensive agriculture, expanding settlements);
- Waterberg region (Limpopo) (mining, water and future expansion driven as national priority);
- Olifants Water Management Area (Mpumalanga and Limpopo) (big irrigation scheme, major water quality issues, mining pressure); and
- Berg and Breede River Catchments (WC) (high value agriculture and settlements but with low absorptive capacity for pollution).

Figure A14 Stressed catchments within areas of competing land-use



Source: SANBI-2018. Stressed Catchments of concern due to competition for use.

The Mpumalanga Coal Mining and Coal-Fired Power Plant region will be under increased pressure for environmental considerations, possible decline in demand in coal and large scale employment under threat. Coal Fired Power Station Dependency on Water Transfers. The Lower Vaal Catchment is highly polluted and both the Upper and Lower catchments are key water providers to the Gauteng Metropolitan region which is the area of highest economic production in the country. These areas require (1) enhanced management of water over use and distribution as well as radical action and clean up with regard to pollution management, (2) regional economic diversification and transition, and (3) shared forecasting, phasing, pro-active and regional scale economic transition planning, scenario development and enterprise development between multiple role players and institutions.

B6.5 *Significant plans, studies and sources that informed the spatial specific selection of frame elements*

- Local Action for Biodiversity: Wetlands South Africa – http://biodiversityadvisor.sanbi.org/wp-content/uploads/2016/07/LAB-Wetlands-SA-brochure.pdf;
- Important Bird Areas - http://www.birdlife.org.za/conservation/important-bird-areas/iba-map;
- Atlas of Freshwater Ecosystem Priority Areas in South Africa (Nel et al, 2011);
- NDP. Chapter 6. Page 196;
- Department of Water and Sanitation (DWS). (2017). Draft National Water Plan, DWS (2017: 40-41);
- Implementation manual for freshwater ecosystem priority areas. Driver A., Nel JL., Snaddon K., Murray K., Roux DJ., Hill L., Swartz ER., Manuel J. and Funke N. (2011) Report No. 1801/1/11, Water Research Commission, Pretoria;
- Transnet, 2016. National ports plan 2016;
- TRANSNET. (2016). 30-year Long-term Planning Framework (Chapter 4 Port Development Plan). Johannesburg;
- Transnet. 2015. Transnet Freight Rail: Road to Rail Strategy Progress: June 2015. Presentation to the Parliamentary Committee on Public Enterprises, Cape Town, South Africa;
- Department of Transport (DoT). 2013. National Household Travel Survey datasets. Pretoria, South Africa;
- Department of Water and Sanitation. National Water and Sanitation Master Plan. Draft 2.6. 2017;
- Greenberg. 2013. Institute for Poverty, Land and Agrarian Strategies, UWC. Page 18;
- Greenberg. 2013. Institute for Poverty, Land and Agrarian Strategies, UWC. Page 19;
- Cousins (2015), Aliber et al (2017);
- Atlas of Freshwater Ecosystem Priority Areas National Biodiversity Economy Strategy (DEA);
- EWT report (Taylor et al 2016) on wildlife ranching, which includes an assessment of employment in the sector (65 000 jobs in 2014 – see below);
- WWF's 2015 report on SWSAs – for descriptions of individual SWSAs;
- SANBI, 2016: Framework for Investment in Ecological Infrastructure);
- Driver, A. Ecological Infrastructure FAQs. Unpublished Presentation. 2017;
- KwaZulu-Natal, Provincial Growth & Development Plan, 2018;
- KwaZulu-Natal, Provincial Growth & Development Strategy, 2016;
- Eastern Cape, Provincial Spatial Development Plan, 2010;
- Free State, Provincial Spatial Development Framework, 2014;
- Gauteng, Provincial Spatial Development Framework, 2017;
- Limpopo, Provincial Spatial Development Framework, 2016;

- Mpumalanga, Provincial Spatial Development Framework, 2013;
- Northern Cape, Provincial Spatial Development Framework, 2012;
- North West, Provincial Spatial Development Framework, 2016;
- Western Cape, Provincial Spatial Development Framework, 2014; and
- Significant programmes, principles, policies or projects relating to environment:
  - Grasslands Programme (SANBI): https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/grasslands-programme;
  - Freshwater Programme (SANBI): https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/freshwater-programme;
  - Succulent Karoo Programme (SANBI): https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/succulent-karoo-programme;
  - Ecological Infrastructure (SANBI): https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/ecological-infrastructure; and
  - CAPE Programme (SANBI) conservation of the Cape Floristic Region: https://www.sanbi.org/biodiversity-science/science-policyaction/mainstreaming-biodiversity/fynbos-programme.