

DRAFT NATIONAL SPATIAL DEVELOPMENT FRAMEWORK

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ABBREVIATIONS AND ACRONYMS

BEPPs	Built Environment Performance Plans
CBA	Critical Biodiversity Area
CoGTA	Departments of Cooperative Governance and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
CSP	City Support Programme
DAFF	Department of Agriculture Forestry and Fisheries
DHS	Department of Human Settlements
DoT	Department of Transport
DPME	Department of Planning, Monitoring and Evaluation
DRDLR	Department of Rural Development and Land Reform
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
IGR	Intergovernmental Relations
IUDF	Integrated Urban Development Framework
LUMS	Land Use Management Systems
M&E	Monitoring and Evaluation
MEC	Member of the Executive Council
MinMec	Ministers' and MECs' Forum
MTSF	Medium Term Strategic Framework
NATMAP	National Transport Master Plan 2050
NDP	National Development Plan 2030
NGO	Non-Governmental Organisation
NGP	New Growth Path
NPC	National Planning Commission
NPO	Non-Profit Organisation
NSDF	National Spatial Development Framework
NSDP	National Spatial Development Perspective

NT	National Treasury	StepSA	Spatial and Temporal Evidence Platform for South
PICC	Presidential Infrastructure Coordination Committee		Africa
PRASA	Passenger Rail Agency of South Africa	SWSA	Strategic Water Source Area
PSDF	Provincial Spatial Development Framework	TOD	Transit-Oriented Development
RDP	Reconstruction and Development Programme		
SACN	South African Cities Network		
SADC	Southern African Development Community		
SALGA	South African Local Government Association		
SANBI	South African National Biodiversity Institute		
SDF	Spatial Development Framework		
SDGs	Sustainable Development Goals		
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 Entity		

GLOSSARY OF TERMS

Apartheid

A political system and its 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 "homelands/ Bantustans" for Black South Africans was also established.

Bantustans

Areas reserved for African occupation under the Apartheid government. Approximately 13% 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 poverty, neglect and isolation.

City

Cities are characterised by large communities living at high residential densities, a variety of employment opportunities, and high-intensity business and commercial areas. (See also "Urban").

Concentration

Concentration of people and activities refers to (1) a higher density of people and (2) a higher density 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.

Densification

The process of increasing residential densities i.e. the number of people living in a specific area. This supports increased efficiency in the utilisation of infrastructure, services and amenities. This is measure of the number of people living in an area (e.g. 'persons per hectare').

Development Corridor

Integrated linear networks of infrastructure and economic activity. Corridors typically fulfil multiple, complex functions including the movement of people and freight, facilitating trade between areas, flows of information, flow of ecosystems services such as water and gas, and facilitating tourism. Supportive functions may be located in corridors, e.g. logistics. Corridors often also include a human settlement and/or economic activity component, e.g. higher density transit-oriented mixed-use development or industrial development situated along the main infrastructure network.

Ecological Footprint

A measure of the 'load' imposed by a given population on nature. It represents the land area of average quality needed to sustain current levels of resource consumption and waste discharge by that population including their economic activity. 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. It consists of a network of interconnected structural elements in the landscape and seascape.

Economic Sectors

A division of a country's economy or type of employment of population based upon the economic sector in which that population is employed. The following five descriptors are generally used to define the broad categories/sectors economic activities: (1) the *primary sector* which includes agriculture, mining and other natural resource-based industries; (2) the *secondary sector* covering 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*, reserved for high level decision makers in government and industry.¹ In some instances, including the NSDF, the last two sectors will be 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

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

Is 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

Having reliable access to a sufficient quantity of affordable, nutritious food through locally grown produce or imports.

Hinterland

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

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*, such as health, education, community and cultural facilities.

¹ <http://www.businessdictionary.com/definition/economic-sector.html>

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 concentration of population and settlements, economic activities and use of natural resources are organised and related within the country as a whole.

Land Reform

A broad encompassing term that in the South African context includes (1) *land restitution* (redress of wrongs committed under the Apartheid government), (2) *land redistribution* (provision of land to the poor who do not have access to land for residential and economic purposes, and (3) *tenure reform* (ensuring security of tenure).

National Development Paradigm

The overarching set of ideas and beliefs as to the way in which a country should be developed, how its economic relations should be structured, how benefits of the economic system should be shared, and how its resources should be used and managed.

National Economic and Social Interactions and Relations

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

National Spatial Development Logic

The approach to, and way in which national space is used and managed in pursuit of the objectives of the prevailing national development paradigm and its associated legal and policy framework.

National Spatial Development Pattern

The spatial outcome of the prevailing national spatial development logic, and entails (1) where, how and for whom settlements are built, (2) the land tenure types and land-use patterns in the settlements, and (3) the type, mix, density, intensity and distribution of land-uses in these settlements.

Natural Resource Foundation

The natural resources of the country, consisting of both ecosystem services and sensitive and important ecological systems that need to be protected.

Node

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

Protected Area

An area of special natural, ecological, architectural or historic interest, which is desirable to preserve and/or enhance. The protected areas referred to in the NSDF are those areas that are officially classified as such in terms of the National Environmental Management Act, 1998.

Rural

Sparsely populated areas, not included in big cities or towns. Economic activity typically consists of agriculture, fisheries, forestry, nature conservation, tourism, mining or similar and related activities. In South Africa, there are also rural areas that are more densely populated but yet are not compact or urban in nature, which is a remnant of the Apartheid era spatial planning and the creation “homelands”.

Rural Development

An intervention process aimed at improving the quality of life and economic well-being of people living in rural areas.

Settlement (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 large cities or groups/conglomerations of cities.

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 study of the space economy looks at spatial relationships between individuals and organisations, and explores the economic reasons that underpin the formation, functioning and development of towns, cities and their hinterlands in space.

Spatial Transformation

In the South African context, this term broadly refers to a change in the structuring and organisation of settlements and economic activities to counter the segregated spatial patterns established during Apartheid, and address/alter the inefficiency and inequality in opportunity resulting from these patterns.

Sustainable Development

Development that meets the needs of the present 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

It can be described as: (1) a story of how things, settings or situations can and will change; (2) a narrative of how a required change, transition or transformation will be brought about; or (3) a description of how a desired outcome will be accomplished through a planned set of interventions.

Town

Places 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

Residential townships established during the Apartheid era for temporary occupation by Black South Africans on the outskirts of towns and cities, with only the most basic of amenities and infrastructure provision.

Transit-Oriented Development (TOD)

TOD promotes higher density and mixed-use development close to significant transit connections. It aims to make the best use of land located along such routes, increase use of public transport and promote sustainable urban development.

Urban

Referring to, located in or constituting a city. Urban areas are characterised by large communities living at high residential densities, a variety of employment opportunities, and high-intensity business and commercial areas. Large towns are generally also considered as 'urban'. The distinction between cities and towns varies and is usually based on a combination of population size, level of economic output and development density. Smaller towns are often regarded as being part of the rural, and not the urban landscape, e.g. a 'rural service town' that serves the surrounding rural area through the provision of schools, basic healthcare, basic retail and similar services.

Urbanisation

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

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-four 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 *eight* interrelated parts:

- *Part One* provides an overview of the background to, need for and role of the NSDF, locates it within the context of the National Development Plan (NDP), and 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 the data that was gathered and processed, the many work-sessions that were held, and the consultations and engagements that were undertaken;

- *Part Three* provides a high-level, spatially-referenced, contextual overview of the future our country is heading into, the many opportunities this future holds, the challenges we will need to overcome, and the implications these have for state action, budgets and investment and spending in national space;
- *Part Four* 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 the national spatial development pattern from 'one for the few', to one in which everyone matters, and land and other resources are shared and wisely and equitably used for the advancement of, and enjoyment by all;
- *Part Five* puts forward the *national spatial development vision* of a shared and just South Africa in accordance with the shifts as set out in Part Four, and provides an indication as to what life would be like in our country by 2050;
- *Part Six* sets out a series of *five spatial development frames* to inform, direct and guide all future infrastructure investment and development spending decisions by government and the private sector in line with our national spatial development vision, to realise our core national development objectives, as set out in the NDP. These frames work together in an interrelated manner as follows:
 - *Frame One: Urban Regions, Clusters and Development Corridors as Engines of National Transformation*: To ensure and sustain national economic growth, drive inclusive economic development and derive maximum transformative benefit from urbanisation and urban living;
 - *Frame Two: Productive Rural Regions and Regional Development Anchors as Foundation of National Transformation*: To ensure national food security, rural transformation and rural enterprise development and quality of life in rural South Africa through a set of strong urban-rural

development anchors in functional regional-rural economies;

- *Frame Three: National Ecological Infrastructure System as Enabling Infrastructure for a Shared and Sustainable Resource Foundation:* To enable sustainable and just access to land and other national resources for quality livelihoods of current and future generations;
- *Frame Four: National Connectivity Infrastructure Networks as Enabling Infrastructure for a Shared, Sustainable and Inclusive economy:* To develop, expand and maintain a national transport, trade and communication network in support of supra-national, national, regional and local economic development; and
- *Frame Five: National Social Service Infrastructure System as Enabling Infrastructure for National Well-being:* To ensure access for all to the benefits of high-quality basic, social and economic services in a well-located system of vibrant rural

service towns, acting as urban-rural anchors and rural-rural connectors.

- *Part Seven* deals with the *implementation* of the NSDF, lists the tasks required in doing so, including championing, communicating, institutionalisation, embedding, and actioning, maps the significance of these tasks over time, and provides an overview of the role-players involved in putting in place the five national spatial development frames; and
- *Part Eight* provides a *summary of, and conclusion* to the framework.

While the NSDF recognises the challenges involved in bringing about the necessary changes in planning, budgeting and implementation, it is also very clear as to their importance in contributing to the joint crafting of our 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".ⁱ

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 voiced 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."ⁱⁱ

The importance of (1) space and (2) land and (3) their densely interwoven connections to economic development and livelihoods, was clearly 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."ⁱⁱⁱ

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 articulated as follows:

The existing '**national spatial development pattern**' of our country is the outcome of the '**national spatial**

development logic’ of (1) colonialism and Apartheid, as well as that of (2) the first two decades of democracy.

This logic is determined by and derived from the prevailing **‘national development paradigm’**, which includes (1) a set of national economic, social and spatial development objectives; (2) an enabling and supporting national legal and policy framework; and (3) a national spatial development vision.

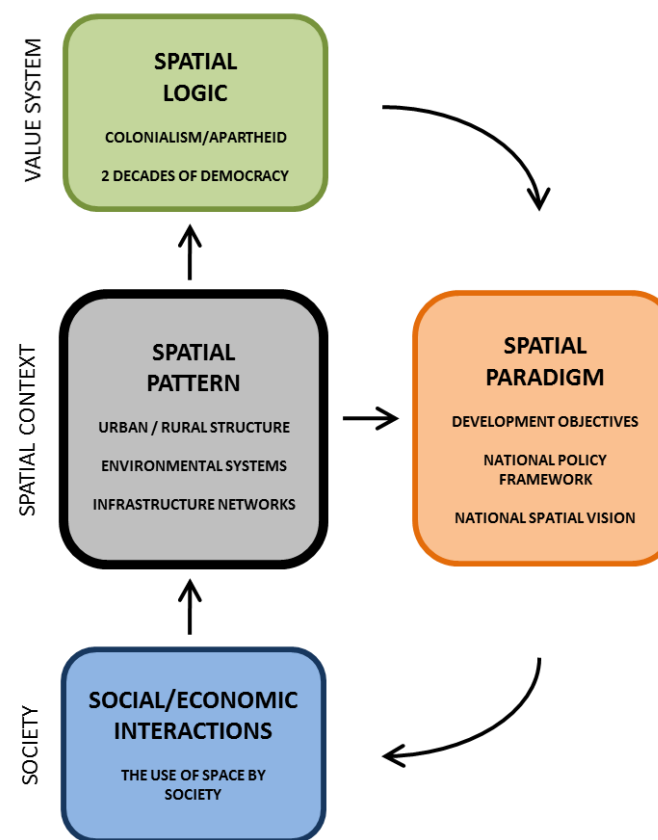
The national spatial development pattern determines, drives, enables and facilitates a dense series of **‘national economic and social interactions and relations’**. These interactions and relations, in turn, feed back into the national development paradigm, either (1) reinforcing and sustaining it, or (2) changing it. This circular process is set out on the left-hand side of **Figure 1** below (see next page).

In accordance with this logic, breaking the cycle and moving from the existing national spatial development pattern – haunted by the past, and sustained by the present – to a post-Apartheid spatial context, requires targeted interventions across all levels of the national transformation process. The right-hand side of **Figure 1** conceptualises the role played by the NSDF in this regard at various levels as an instrument of spatial change.

Before getting to the NSDF’s *Theory of Change* and the targeted *national interventions* proposed in this NSDF, it important to get a sense of (1) what needs to be done, (2) what has been done, and (3) what more needs to

be done. This is done in the following section, which in turn is followed by the NSDF’s Theory of Change.

Figure 1: The National Transformation Logic



1.3 Taking Stock

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 to do 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 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 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. In the rapidly-emerging towns and cities, the resulting national spatial development pattern consisted of racially-separated settlements in which white people enjoyed privileged status and by and large, decent housing conditions. Black people were denied choice, dignity and respect, and treated as objects to support production through 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 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 patterns 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, the use of land and the spatial relation of land-uses to each

other, became of strategic importance. The resulting 'survive, suppress and rule' **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 then Pretoria-Witwatersrand-Vaal Triangle industrial and mining core". At the same time, increasingly draconic measures were introduced to destroy any black economic activity that could compete with white mining, farming, manufacturing and trade. 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) 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 townships, or (2) forced to stay in ethnically-based Bantustans/homelands, and their movement to and from these areas to urban areas forcefully regulated through highly 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 **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 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 *spatial planning*, i.e. 'the planning for the broader ambit within which land parcels are located, parcelled, and connected to each other through road and rail networks, and endowed with other infrastructure', white South Africans who owned land, received '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 destroying the attributes and potential for any increase in property value that might have accrued to them.

This is the dreadful legacy that democratic South Africa inherited in 1994 – the outcome of more than 300 years of unequal spatial investment and

planning – and the physical form/spatial pattern (1) *on which* and (2) *from which* the country's space economy and society had to be transformed.

1.3.2 What have we done and accomplished?

Over the past twenty-four years since 1994, 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 spaces. At the same time, the privileged spaces of Apartheid largely remained 'as is', with what racial integration that took place, focused in former white suburbs and new middle-to-higher income (1) extensions to larger towns and cities, and (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)* (2001-2007), which sought to rationalise, harmonise and integrate the spending and investment proposals of all government sectors and spheres. The NSDP 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 *National Planning Commission* 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 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":

- 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 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:

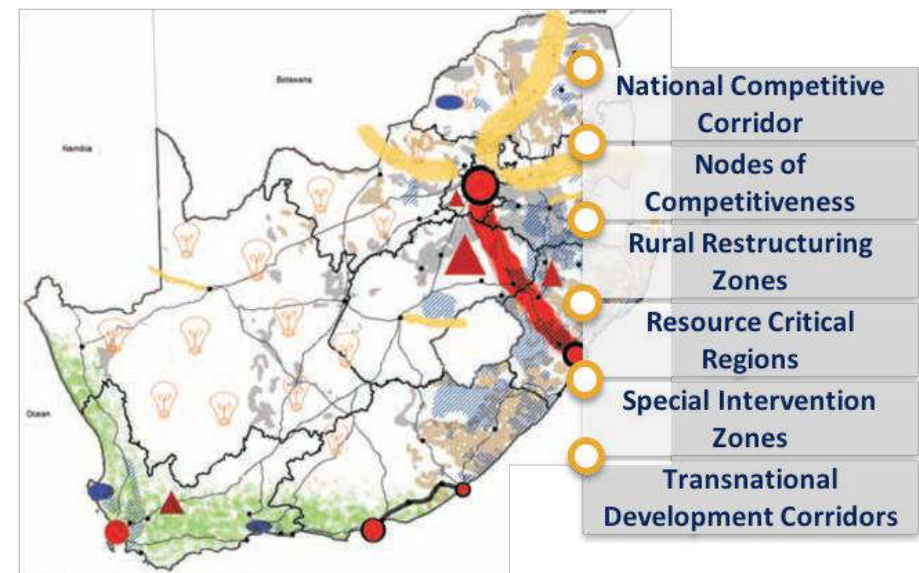
- Fundamentally disrupting and undoing inherited and enduring (1) colonial and apartheid economic, social and spatial investment logics, and (2) their resultant spatial forms and land-use patterns, which in turn impede inclusive economic growth and spatial transformation;
- Making radical changes *in and to space*; and
- Introducing an *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 disrupting the apartheid spatial logic and space economy, and overcoming the inequities and 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’ is recognised as important, given the core significance of space and access to land in bringing about transformation at scale, and ensuring that people and places benefit from this intervention. The chapter also includes a “*proposed national schema for spatial targeting*” (see **Figure 2**) and sets out a series of directives for such a framework, but stops short of providing it. It does, however, propose that a “*national spatial development framework*” be provided for in national legislation.

Figure 2: The NDPs Proposed National Schema for Spatial Targeting



Following on from this guidance, government prepared 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^{iv}

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, 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 of 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 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 once-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 it is 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, 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, irrational, unfair and unequal 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, (2) social and economic inclusion, and (3) equal opportunities and equal access to government services and the amenities that settlements offer. Core in this regard is the introduction of single, uniform spatial planning and land use management systems in municipal areas, including places excluded from such systems in the past. Being framework legislation, it seeks to provide *principles, guidance and norms and standards* for planning in the provincial and municipal spheres of government. The “*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 by all three spheres of government – including the “*National Spatial Development Framework*”;
- Provides for the preparation of “*Regional Spatial Development Frameworks*”; and
- Distinguishes between spatial planning and 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 and implementation.

(d) Summary

Assessing what has been done and accomplished over the last two decades in terms of the **National Spatial 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 Constitution and Cabinet-adopted NDP provide the foundation, and strategic direction for government to respond to our inter-related *core triple challenges* of *inequality, unemployment and poverty*. These are supported by a series of (1) enabling acts and policies, (2) 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 Human Settlements Master Plan, and the National Transport Master Plan 2050.

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 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 Economic and Social Interactions and Relations**, 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, and that while a lot has been done, not that much change has been achieved.*

Leading on from **National Spatial Transformation Logic**, 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 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 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 SPLUMA and the IUDF); and/or

- The **national spatial development logic** *not* having changed from its earlier colonial and Apartheid versions, or its amendment *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 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 the past, 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*, as is set out in the following section.

1.4 The NSDF as Tool for Spatial 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 address 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 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.

1.4.3 The NSDF's Theory of Change

Based on the outcomes of the stock-taking exercise in **Section 1.3**, in terms of (1) *the gaps* and (2) *the explanations* put forward for these, the *Theory of Change* that is proposed 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

- Craft a *strong and credible and Post-Apartheid National Spatial Development Vision*;
- **Step 2:** The new logic and vision is used together with the existing national spatial diagnostic, to craft a *desired Post-Apartheid National Spatial Development Pattern* consisting of five *National Spatial Development Frames*;
- **Step 3:** The *National Spatial Development Frames* are used to indicate what Interventions and Actions are required to bring about the *desired Post-Apartheid National Spatial Development Pattern*; and
- **Step 4:** The (1) *desired Post-Apartheid National Spatial Development Pattern*, (2) set of *National Spatial Development Frames*, and (3) associated series of *Interventions and Actions* are used to prepare clear *Implementation Guidance* for realising the desired national spatial transformation.

The outputs of these steps provide the structure for this document, as set out in **Section 1.6**.

1.5 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, 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. shortly after independence, and in more recent times of strongly-emerging

and fast-growing countries, such as 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 have had the desired impact or were implemented. In many cases, the notion of one 'super-plan' imposing itself on the mandates of other sectors in the national tier/level of government and/or in sub-national tiers/levels of government has not been welcomed. Furthermore, given that such instruments often have coordinating, integration and guiding functions, and do not have their own budgets, it has meant that they have struggled to secure buy-in and support. In other cases, failure to fund, or 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 the fortunes of the country and their lives.

1.6 Document Structure

This document has the following parts:

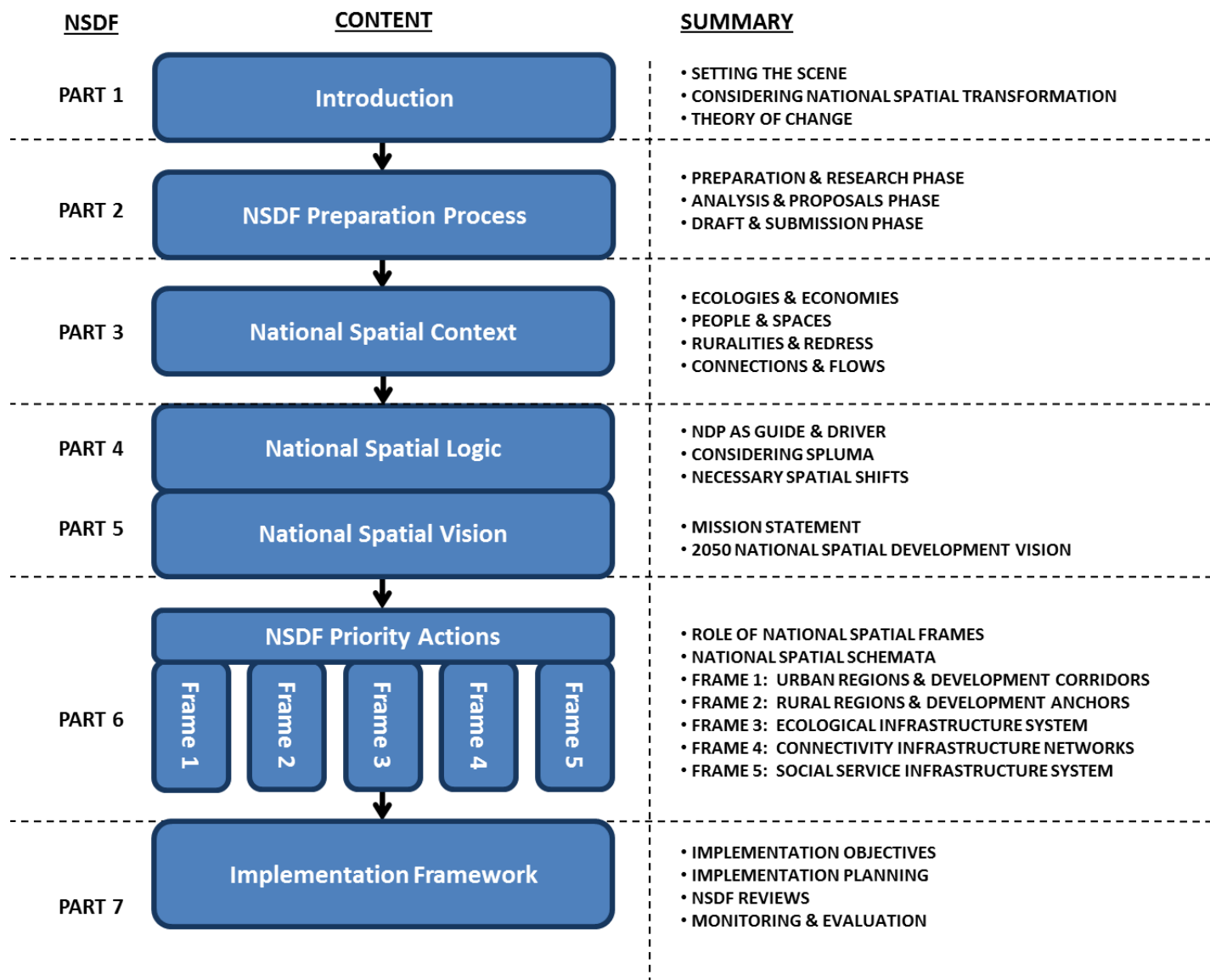


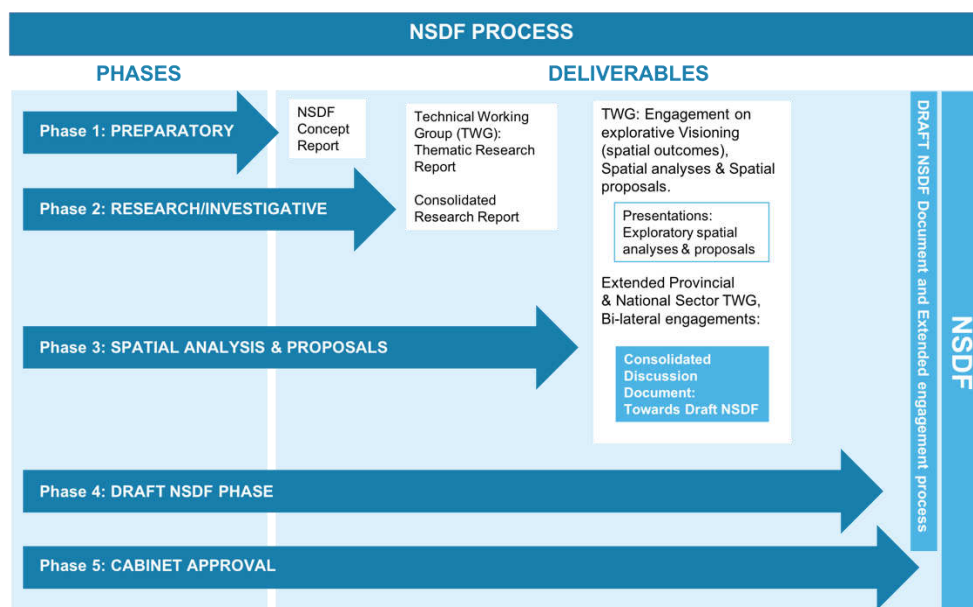
Figure 3: Document Structure

PART TWO: THE DRAFT NSDF PREPARATION PROCESS

2.1 Introduction

The process of preparing the first NSDF for South Africa started in April 2014. This process, which is now in its fourth phase, is set out in **Figure 4** and briefly described below.

Figure 4: NSDF Preparation Process



2.2 Preparatory Work and Research Phase

The compilation of the NSDF started with the preparation of an initial “NSDF Concept Document” by the Department of Rural Development and Land Reform (DRDLR). This was followed by an intensive process of research into a range of thematic areas that (1) influence, and (2) are influenced by the spatial legacies and dynamics in the South African landscape. The thematic research areas 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.

2.3 Spatial Analysis and Proposals Phase

2.3.1 Foundational Work

The focus of this work phase was to identify, secure and prepare base information to enable the compilation of a resource document and data repository for internal discussion and consideration. Key work elements included:

- *Compilation and analysis of a body of evidence:* This included (1) government policy and provincial and sector plans, NSDF thematic research reports, spatial data, external research reports, expert input and bilateral meetings with selected sector

departments for information input, and (2) an online survey and interviews conducted with planning professionals;

- *Process requirements:* This included the Initial Socio-Economic Impact Assessment System (SEIAS) and an associated Evidence Mapping process; and
- *Engagement:* This included NSDF Steering Committee meetings, introductory presentations to the NSDF Technical Working Group, and an introductory presentation to the National Planning Commission.

2.3.2 Preliminary Sharing and Testing

The focus of this work phase was on *sharing and testing the conclusions on spatial challenges and draft proposals for spatial outcomes and strategic objectives* based on the work completed in the previous work streams with government stakeholders. A '*Consolidated Draft Discussion Document*' was compiled with this objective in mind, i.e. to enable (1) a *focused discussion with*, and (2) the *sourcing of inputs, comments and proposals* from national and provincial government departments, municipalities, State-Owned Entities (SOEs), the National Planning Commission, the South African Local Government Association (SALGA) and stakeholder organisations, such as the South African Cities Network (SACN).

2.4 Draft NSDF Phase

This work stream entails the *preparation of and formal engagement on 'the Draft NSDF'*, as provided for in SPLUMA, and compiled in cognisance of the inputs received in the 'preliminary sharing and testing-phase'. It is envisaged that the Draft NSDF and an executive summary will be made available for public engagement, comment and proposals. In addition

to this, an NSDF Indaba/Summit is being planned for engagement on the framework by key government stakeholders, relevant organisations and interest groups.

2.5 Cabinet Submission Phase

The current phase will end with the preparation of (1) the *Final Draft NSDF for Cabinet Submission*, and (2) the documentation as required in terms of the Socio-Economic Impact Assessment System (SEIAS).

PART THREE: THE NATIONAL SPATIAL DEVELOPMENT CONTEXT

3.1 Introduction

A diverse range of (1) national spatial development realities and (2) international, national and sub-national trends, flows and patterns impact on our national development landscape and our ability to realise our national development goals. In the preparation of this Draft NSDF, extensive reviews of many of these elements were done and captured in a 'Consolidated Research Report' prepared during **Phase Two** of the process (see **Section 2.2**).

In addition to this exercise, an extensive and detailed knowledge base was (1) developed and (2) updated and enhanced through engagements with national and provincial sector departments, municipalities, NGOs, interested parties, professional planners and researchers in the field.

The purpose of the section is not to provide a complete overview of the vaults of information gathered in this process, but rather to provide a high-level national spatial diagnostic of the most pertinent challenges, trends, patterns and opportunities to which this Draft NSDF is a response.

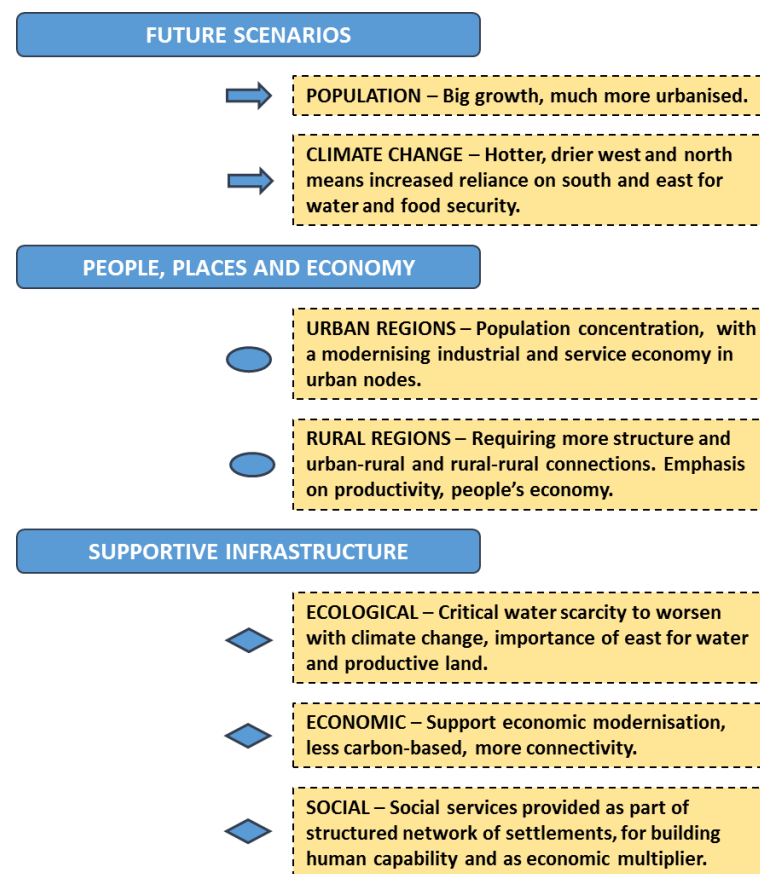
The diagnostic is structured under three thematically-grouped headings:

- *Future Scenarios*, which deal with important forces that will impact on the future spatial organisation of the country;
- *People, Places and Economy*, which refer to the organisation and interrelationships of human activity in space; and

- *Supportive Infrastructure*, which are the ecological, economic and social services required for the functioning of human settlement and the economy.

These three themes are structured as follows in this section of the NSDF:

Figure 5: National Spatial Development Context



3.2 Future Scenarios: Population

MEDIUM-SCALE SCENARIO POPULATION PROJECTION

2016	55.3 MIL
2030	65.0 MIL
2050	74.8 MIL

South Africa's population is projected to grow to 75 million people by 2050 (a 40% increase from the 2016-figure) based on a *medium-scale scenario*, or up to 80 million people (a nearly 50% increase from the 2016-figure) based on a *higher international in-migration scenario*.^v

The majority of our people will live in cities and towns – the United Nations (UN) estimates that 71.3% of the South African population will live in urban areas by 2030, reaching nearly 80% by 2050. Based on existing trends, the vast majority of people will be living in the large city regions, as well as other cities and towns, as shown in **Figure 6**^{vi}. Without national spatial intervention, a substantial number of people will remain in poorly serviced dense rural settlements far from job opportunities.

Based on settlement trends, land capability, the prevalence of economic opportunities and future projected climatic patterns (see **Section 3.3**), the bulk of the population increase will be in the eastern half of the country, except for significant increases in the Cape Town City Region and the Garden Route regional centres and towns.^{vii}

The implications of this population projection are significant: *City regions, cities, large regional centres, regional service centres and service towns in the eastern half of the country must all prepare for a far greater population than they currently have.* A substantial portion of the urban population can also be expected to be younger than 35 years of age and include many poor households.

Figure 6: Population Settlement Trends 2016 – 2050

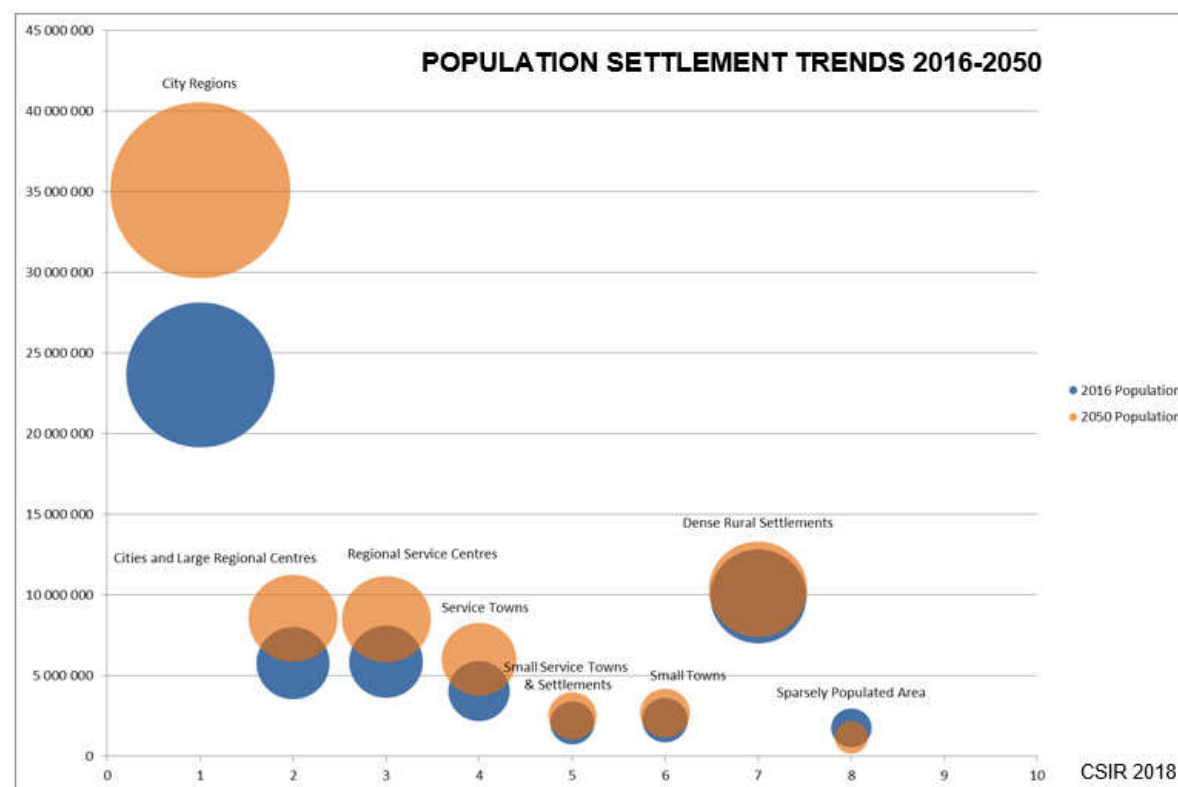
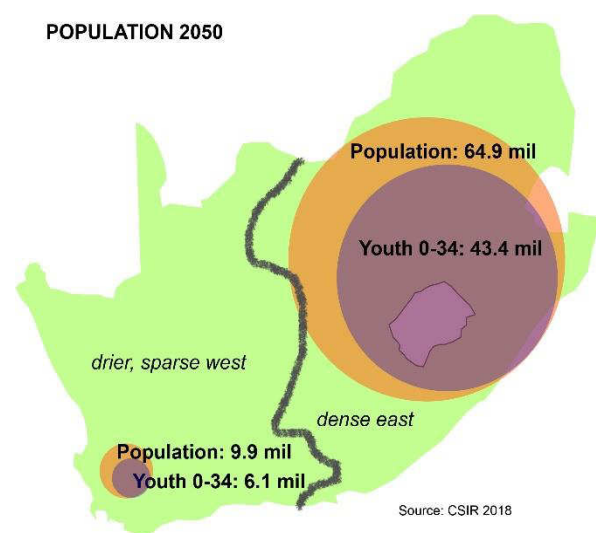


Figure 7: Population 2050



This far larger population will place significant demands on all aspects of human settlement from housing and the provision of social and engineering services, to governance. The far larger population will also place an additional strain on already stressed ecosystem services, notably water, land that is suitable for food production and energy (see **Table 1**).

Focused national intervention will be required to ensure that small towns and dense rural settlements do not become, or remain poverty traps. While these areas are not expected to see a large population growth, they are also not expected to see a significant

population decline in the medium-scale or high-growth scenarios.

ADDITIONAL DEMAND 2016-2050	
Population	19 043 700
Dwellings	4 761 000
DOMESTIC WATER REQUIREMENT (billion m ³)	1.04 *
LAND REQUIREMENT (ha)	
Total residential space(ha)	476092.5 #
Social facility space (ha)	28 164
Parks (ha)	16 346
Sport (ha)	10 664
Roads and parking space (ha)	132 817
Total ha: Social facilities, sports, parks & roads	187 991
Total ha: Residential & social development space	664 084
* This amount is for household domestic use only and is equal to 7% of the current 95% assured yield from all water sources for all uses. Water consumption in 2016 for all uses, including agriculture, mining and manufacturing, already exceeded the current 98% assured yield by 7%.	
# This is an area equal to that of the Municipality of Tshwane, and only refers to the area required for housing. It excludes the land required for all other facilities, such as shops, offices and educational, health and municipal services and recreational areas, and roads.	
Source: CSIR, 2018	

Table 1: Land Demand and Requirements: Medium-Scale Scenario

(Refer to annexure for more details regarding modelling of population scenarios)

3.3 Future Scenarios: Climate Change

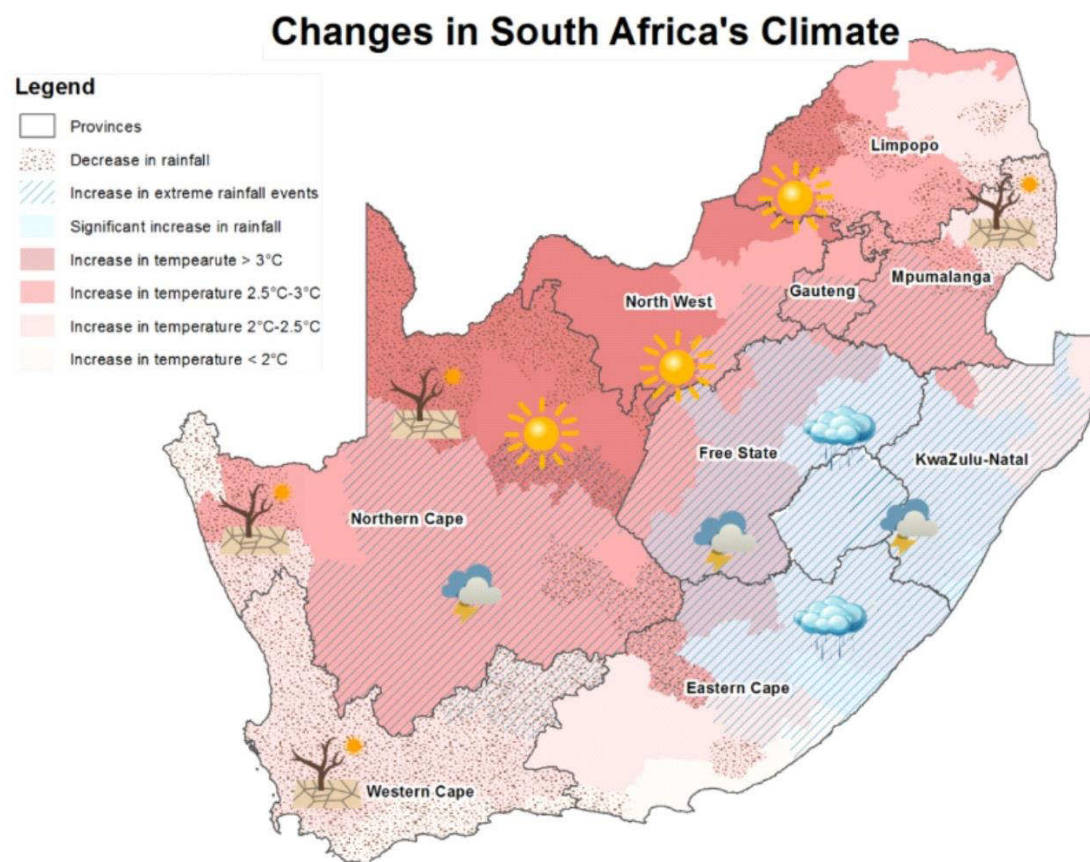
Climate change is a term that generally refers to a shift in weather phenomena associated with an increase in global average temperatures that would occur normally over long time periods. Human intervention however is rapidly affecting the average surface temperatures, which in turn are resulting in changes to climate patterns.

In 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".^{viii ix}

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.

The summarised dominant climate change trends across South Africa are illustrated in **Figure 8** below:

Figure 8: Climate Change Trends



Generally drier conditions and the more frequent occurrence of dry spells are plausible over parts of the interior as indicated in figure 6. Areas most affected by decreases in rainfall is 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 and parts of the Limpopo province.

Increases 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 areas currently. Aligned with the increase in temperature is the likely increase in high fire-danger days, heat-wave days and very hot days.

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).

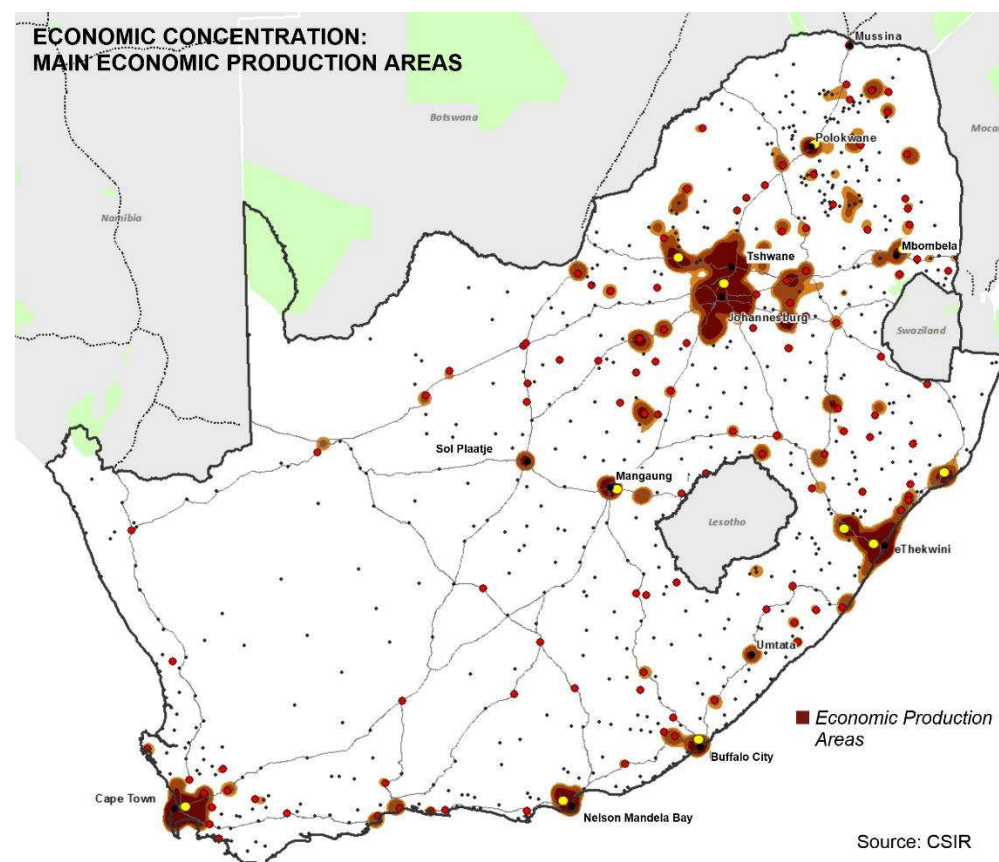
Spatially, climate change has serious long-term implications for human habitation and the productivity of agriculture. These projections suggest an increasingly important role for the central and south-eastern parts of the country for (1) human settlement and (2) food production. To accommodate both, a concerted 'national spatial compaction, shrinking, and sharing-drive' will be required. Changing climate could also benefit some areas allowing different crops to be cultivated in areas not previously possible.

(Refer to annexure for more detail regarding climate change modelling.)

3.4 People, Places and Economy: Urban Regions

More than half of our country's population already live in city regions and cities and this is also the home of (1) the bulk of our economic activities, and (2) the activities of highest economic value. In addition to this, these areas are also the spaces where our national transition into a high-value service-based economy must take place.

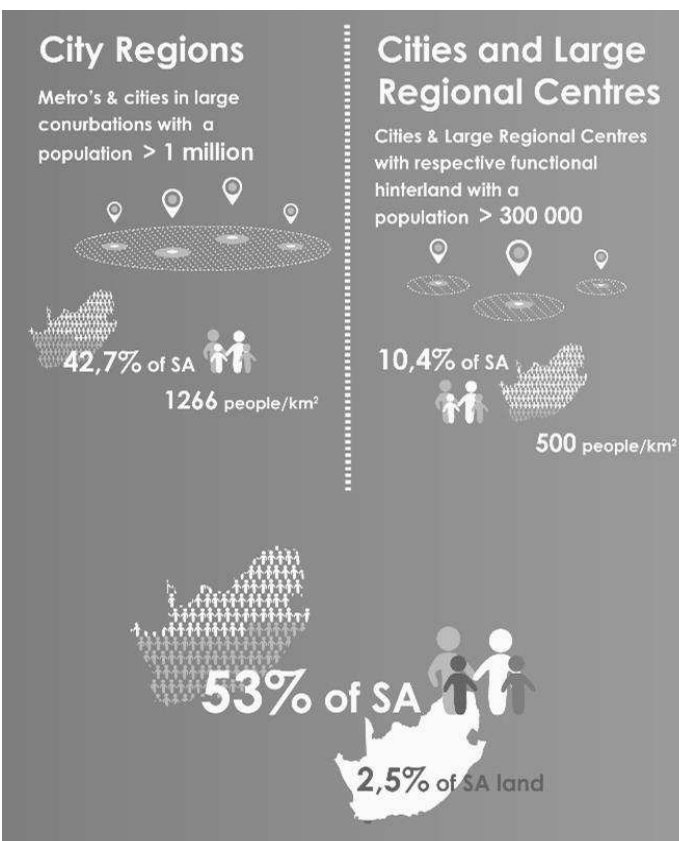
Figure 9: Main Economic Production Areas^x



CITY REGIONS:

**86.5% OF VALUE OF NATIONAL FORMAL
ECONOMIC ACTIVITY in 2016**

87.6% OF SERVICES SECTOR IN 2016



The city regions are important anchors in the economy and act as international gateways for trade with the SADC region and world. The strengthening of trade flows and especially for value-added products are also crucial for the transformation of our economy.

Figure 10: Cross-Border Connections^{xi}

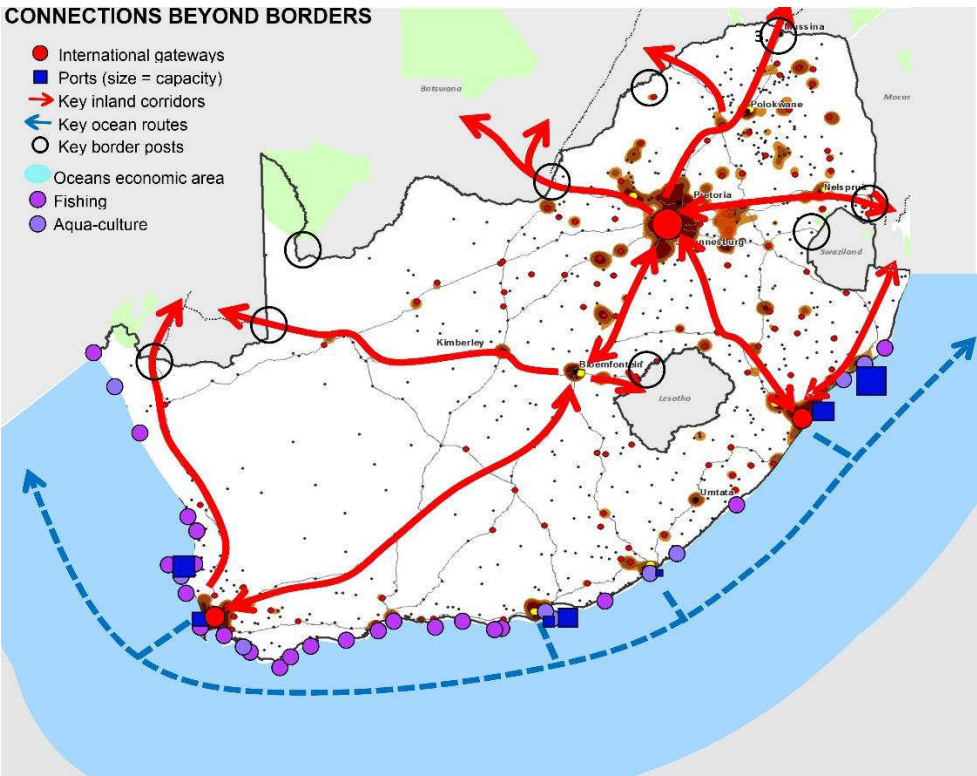
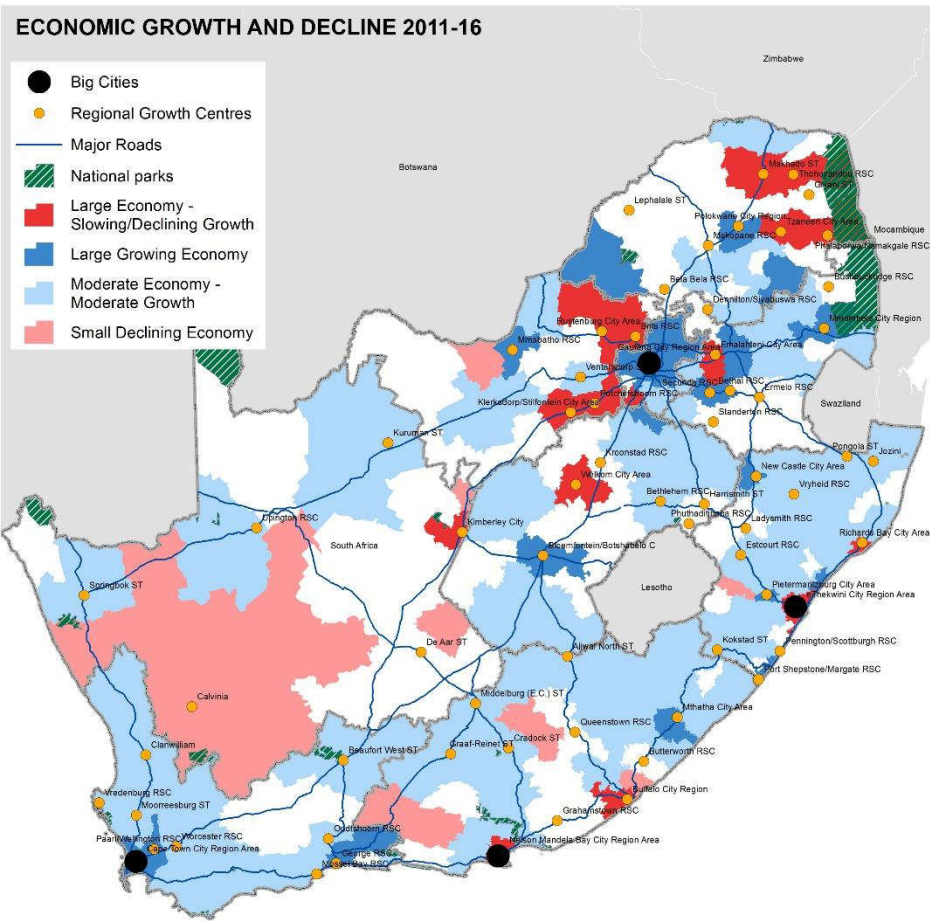


Figure 11 broadly indicates areas of significant economic growth or decline since 2011. Of special significance are the city regions and surrounding areas, which are the (1) *growth points* of a more industrial and service-oriented economy and (2) *gateways* of international trade.

Figure 11: Economic Growth and Decline 2011-16^{xii}



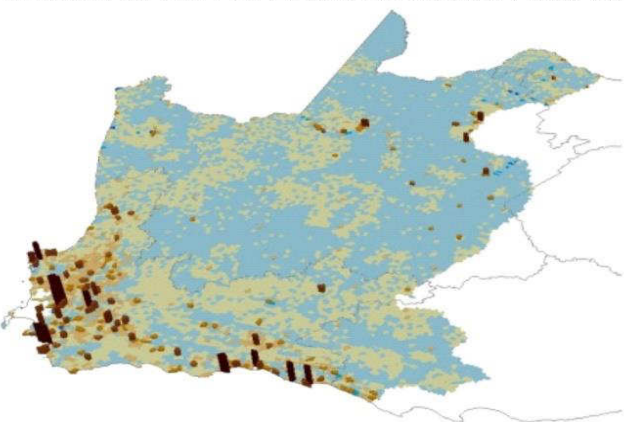
Of concern is the area of economic decline around the Gauteng City Region. This is partly a result of the declining mining economy. The area is in urgent need of economic transformation, as it is part of a region that will face large natural population growth and increased urbanisation.

3.5 People, Places and Economy: Rural Regions

As alluded to earlier in this section, South Africa can be divided into a sparsely populated western and a densely populated eastern half, based on a variety of attributes, distinct settlement patterns, land capabilities and climatic issues. Rural development patterns in these two halves reflect these differences, with *the eastern side* having a much larger population residing in dense rural settlements, and a much denser network of towns than in *the west*. Despite their other differences, both halves have experienced far more population growth and concentration in regional service centres and towns than in the surrounding dense and sparse rural settlement areas.

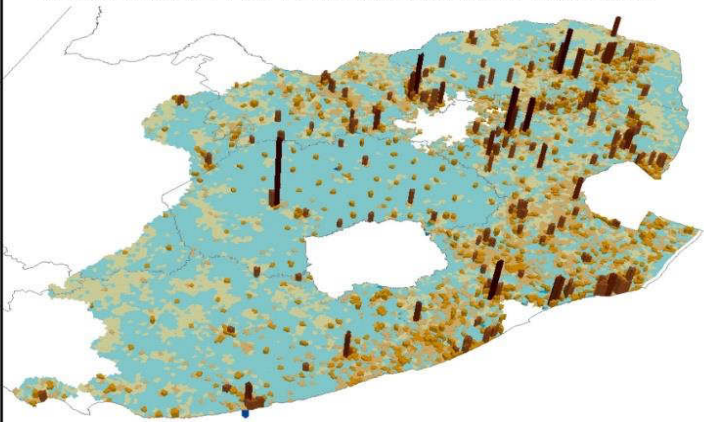
Figure 12: Sparse West and Dense East Population Change 1996 - 2011^{xiii}

SPARSE WEST: POPULATION CHANGE 1996-2011



Population change: number of people	Population change: places
-1 000 - -1 790	
-500 - -1 000	
0 - -500	Regional Service Centres: + 40%
0 - 100	
101 - 1 000	Towns: + 49%
1 001 - 3 000	
3 001 - 5 000	Sparse Rural: + 9%
5 001 - 10 000	
10 001 - 20 000	Dense Rural Settlements: + 9%
20 001 - 38 135	Total 2011: 6.5 mil

DENSE EAST: POPULATION CHANGE 1996-2011



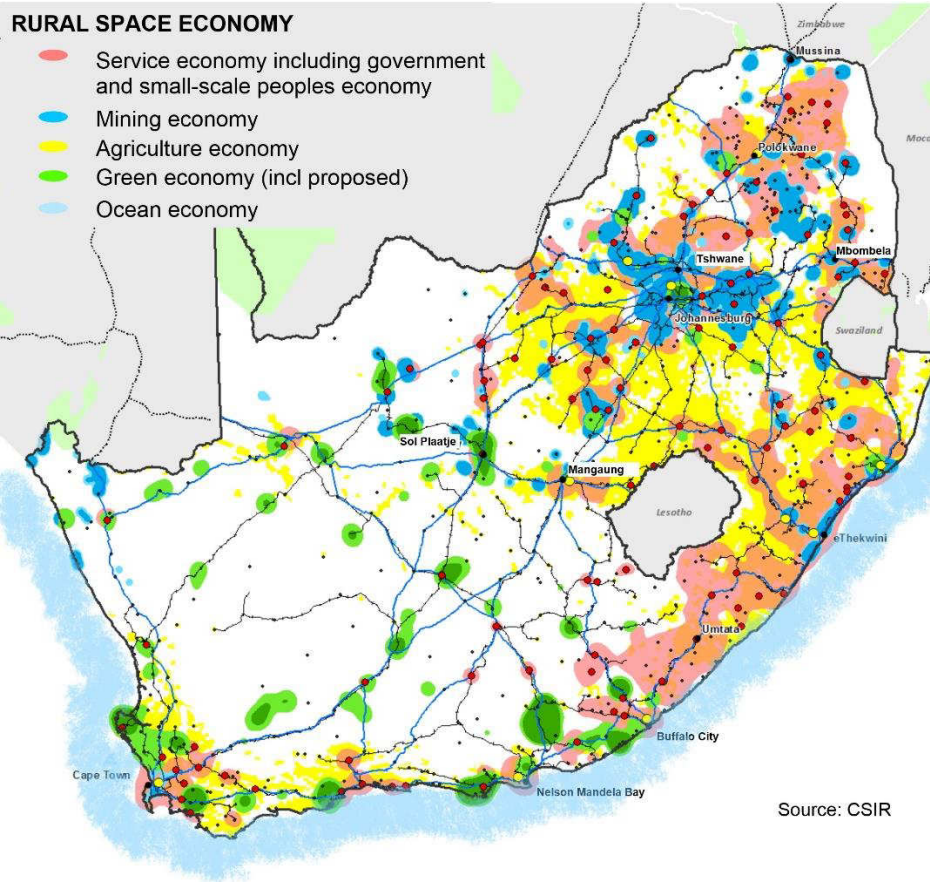
Population change: number of people	Population change: places
-20 000 - -42 000	
-10 000 - -20 000	
0 - -10 000	Regional Service Centres: + 26%
1 - 100	
101 - 1 000	Towns: + 36%
1 001 - 10 000	
10 001 - 30 000	Sparse Rural: - 21%
30 001 - 50 000	
50 001 - 100 000	Dense Rural Settlements: + 7%
100 001 - 263 324	Total 2011: 45 mil

The dense rural areas in both halves, including the former Bantustan areas, present significant developmental challenges.

A key reason for this is that the large and rapidly growing towns in former Bantustan areas were never designed to reap the benefits of agglomeration. Settlement planning and design was rudimentary, and scant attention was given to future expansion and associated servicing needs. In addition to this, many of these towns also face significant governance and financial viability challenges.

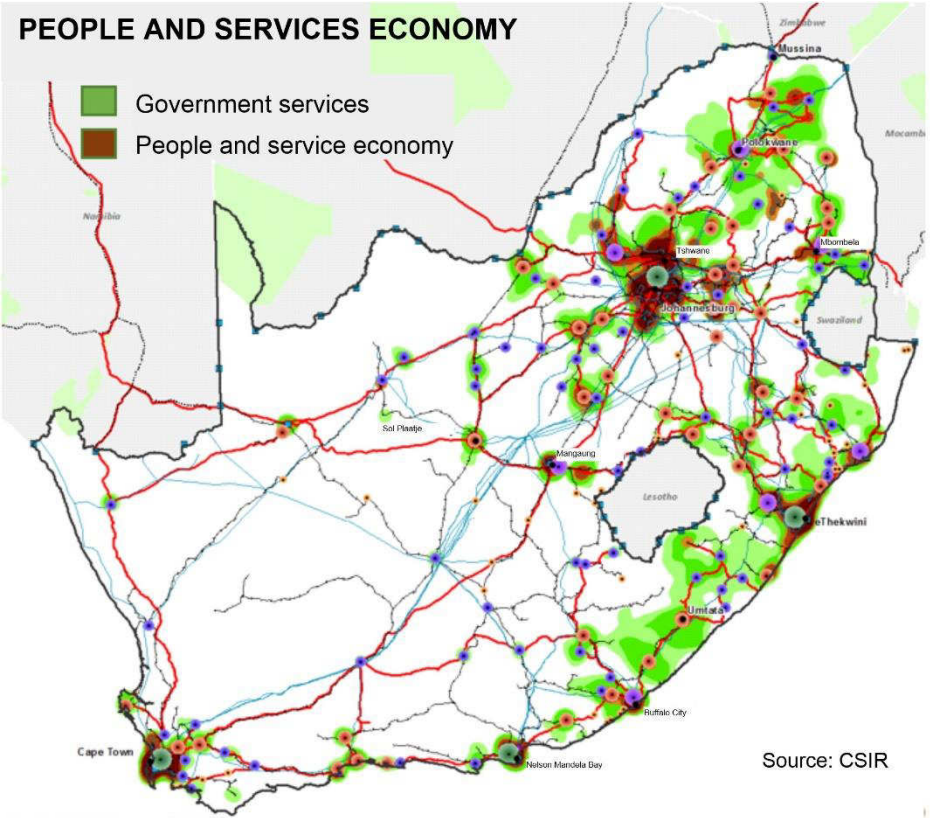
Agriculture is mostly concentrated in the central and eastern part of the country and along the coast. Mining occur mostly in the central interior and green economies closely follow urban patterns. Overall, the highest concentration of more rural-based activities is in the eastern half of the country, with the exception of the south-west Cape coast.

Figure 13: Rural Space Economy^{xiv}



Government services closely follow the dense rural settlement pattern, with a high concentration of such services in the eastern areas. Densely populated areas, urban and rural, provide an opportunity for small-scale economic interactions between people in the form of trade or service provision, providing fertile ground for micro-enterprise development.

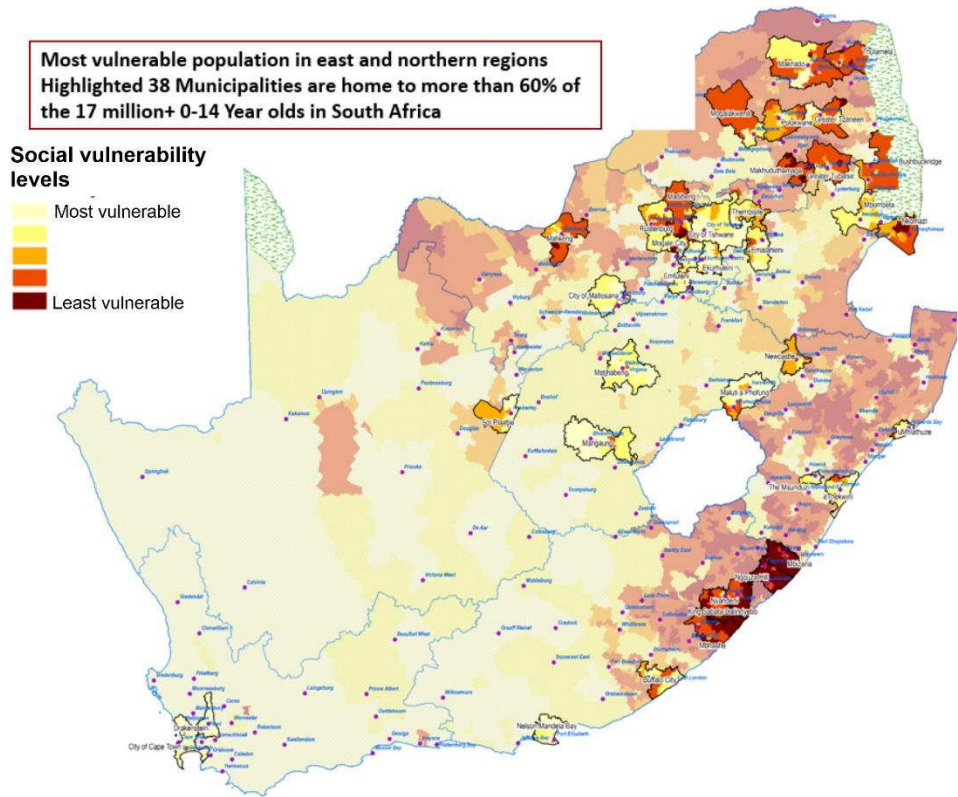
Figure 14: People and Service Economy^{xv}



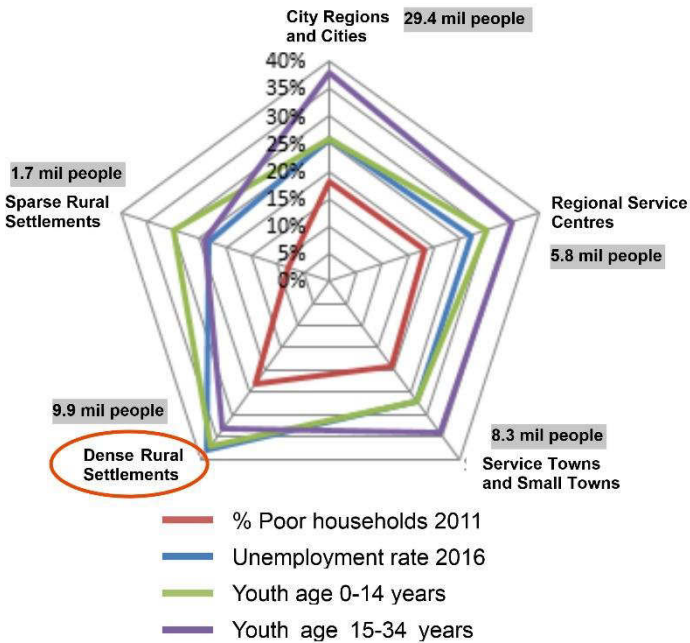
As in the national space, very little shared and inclusive growth has been experienced in dense rural areas, with communities remaining highly vulnerable in terms of poverty, unemployment and the concentration of dependents, i.e. children below 14 years of age. Specific action will be required to address the needs of the youth and the poor in these areas, specifically access to education.

Figure 15: Social Vulnerability^{xvi}

VULNERABLE COMMUNITIES & FUTURE GENERATIONS



SPATIAL INEQUALITY AND VULNERABILITY



Dense Rural Settlements

18% of SA's population
11% of SA's land
9.9 million of SA's people

3.6 Supportive Infrastructure: Ecology

Ecological infrastructure refers to naturally functioning ecosystems that generate or deliver valuable services to people to support their economic activities and enhance or maintain their quality of life.

Spatially, South Africa's ecological infrastructure is defined as (1) existing protected areas, (2) fresh water bodies, (3) the strategic water source areas, and (4) Critical Biodiversity Areas (CBAs).

In terms of water resources, cities and towns that support the national economy and large population concentrations are already relying on water transfers from stressed catchment areas.

Based on projections, the national water deficit, or difference between water requirements and water availability, could be between 2,7 and 3,8 billion m³/annum by 2030, a gap of about 17% of available surface and ground water, if the interventions proposed in the Draft National Water Plan are not implemented (DWS, 2017).

Figure 16: Water Reliance

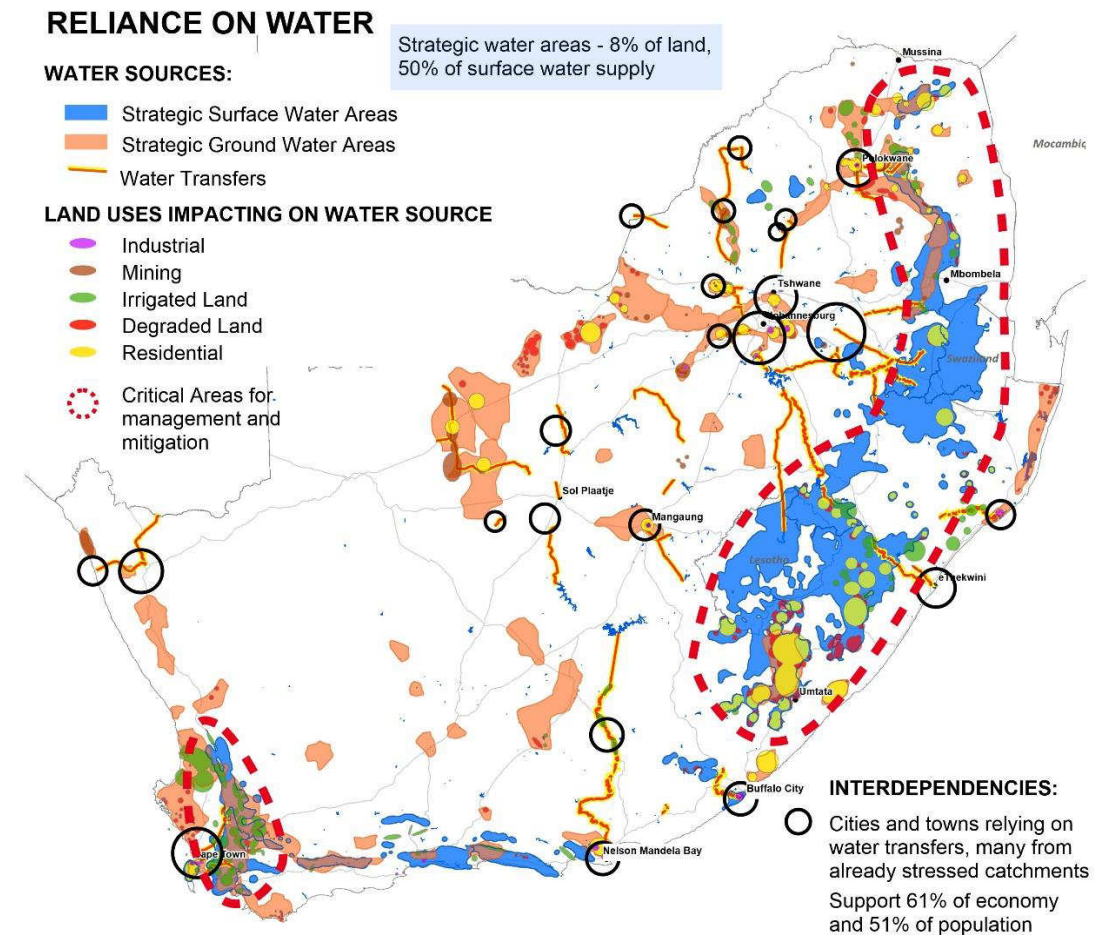
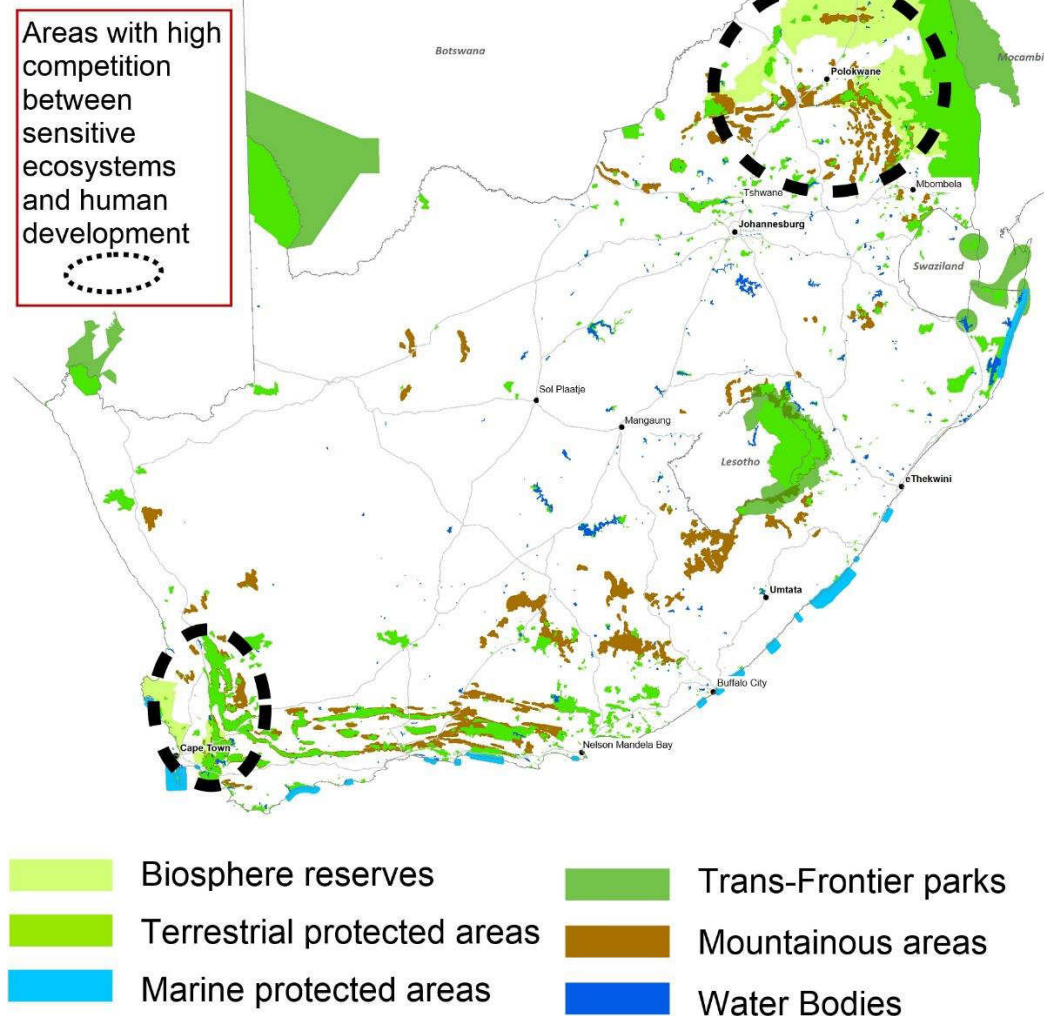


Figure 17: Protected Areas^{xvii}

PROTECTED AREAS



From an ecological perspective, the protection of sensitive ecosystems is crucial for (1) the maintenance of biodiversity, and (2) ensuring resilience at both a national and global level.

In some areas, notably the north-east and south-west of the country, managing and mitigating the impact of high intensity human development on sensitive ecosystems has to be prioritised. This includes the impact of agriculture, mining and human settlement on such systems.

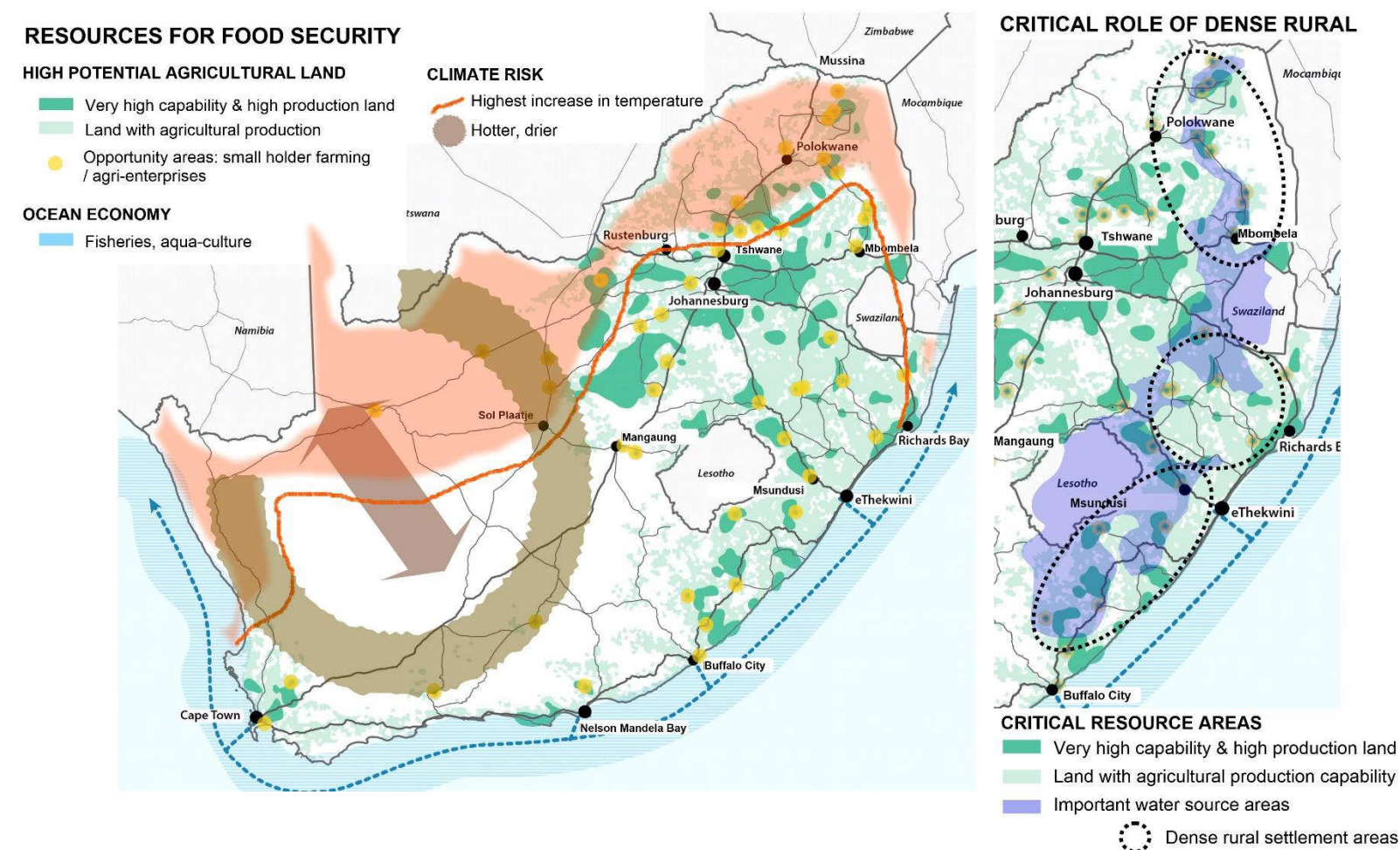
The contribution of land as a scarce resource to support food security should not be under-estimated. Only about half of the country's land area has the potential to be used productively, if discounting current settlement areas, mountainous areas and arid land. The percentage will be even smaller when local suitability, sensitivities and restrictions are taken into account.

Land As Ecological Infrastructure:

12% Used For Settlements
48% Rural Productive Land
 40% Arid Land and Mountains

The ecological foundation also provides high potential, high production agricultural land for future food security, and this is becoming increasingly important in the light of the size of expected population growth by 2050. This will be accompanied by a rapidly-growing shift and increase in the reliance on the eastern parts of the country for food production, due to the climate change pressures as discussed earlier in this section. This pressure will also be exerted on the dense rural settlements in the east. These areas' significance in national (1) food production and (2) surface water supply will become ever-more important.

Figure 18: Resources for Food Security^{xviii}



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.

3.7 Supportive Infrastructure: Social

Social infrastructure refers to capital investment in quality facilities that are (1) well-equipped, maintained and operated, and (2) staffed to the correct level by well-trained personnel who provide a range of critical social services to the community. These 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 issues in both rural and urban regions. 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 not only means expanded requirements for social facility investment and operation, but also presents an opportunity for meaningful employment in rural towns.

Table 2: Social Facility Requirements for 2050 Population

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

The positive impact of social infrastructure investment is far-reaching. Investment in social infrastructure, if used positively, and if provided in the correct places, acts as a highly effective and sustainable economic multiplier.

The importance of spatial planning to guide targeted infrastructure investment cannot be over-emphasised. Establishing a sound spatial logic that optimises human capital development together with economic impact is necessary.

3.8 Supportive Infrastructure: Economic

South Africa has a solid and well-established road and rail network supporting economic activity. This network performs a dual function: it (1) moves *people* to and from places of employment, education, entertainment, cultural activities, homes of friends and relatives, and social services, and (2) transports *freight*. High connectivity is core to South Africa (1) becoming an increasingly service-based economy, and (2) rapidly expanding trade with especially its SADC partners.

If a fast-growing, more inclusive economy is to be achieved, the development of movement infrastructure and 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 travel distance, and (3) *higher levels of beneficiation and processing of raw materials*, to reduce the volume of raw products that require road and railway networks, and that pass through our harbours. The current movement network will also have to be strengthened, especially in coastal areas in the eastern half of the country, to support the population, economic and climatic shifts described earlier in this section. 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 TOD-type formats.

Figure 19: Movement Infrastructure^{xix}

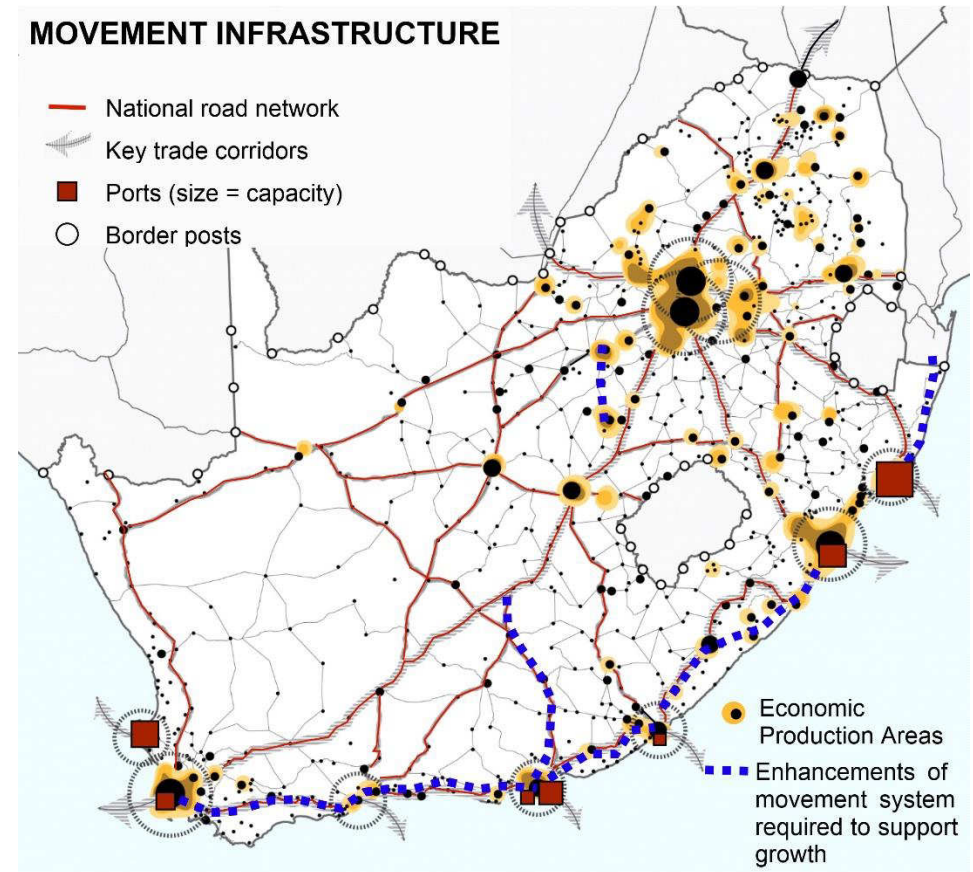
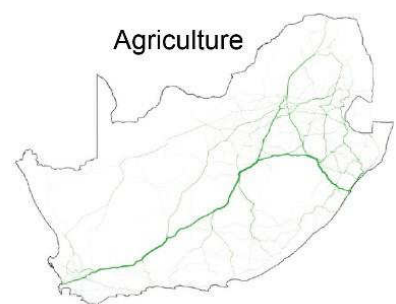
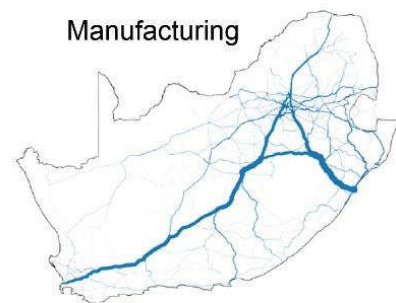
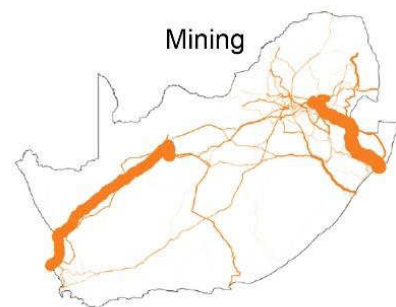


Figure 20: Freight Flow Volumes

FREIGHT FLOW VOLUMES



Source: Logistics Barometer 2016
University of Stellenbosch
2014 freight flows

In terms of freight and logistics, South Africa is internationally ranked 34 out of 160 countries, a competitive advantage that can be built on. The lowest score achieved in this benchmarking exercise is for infrastructure-asset management, highlighting the continued need for the maintenance of key existing infrastructure assets to be balanced with the development of new infrastructure. The freight-flow-volumes currently experienced, of which the majority is road-based, highlight the *resource-intensive nature of our economy*, notably the export of raw materials.

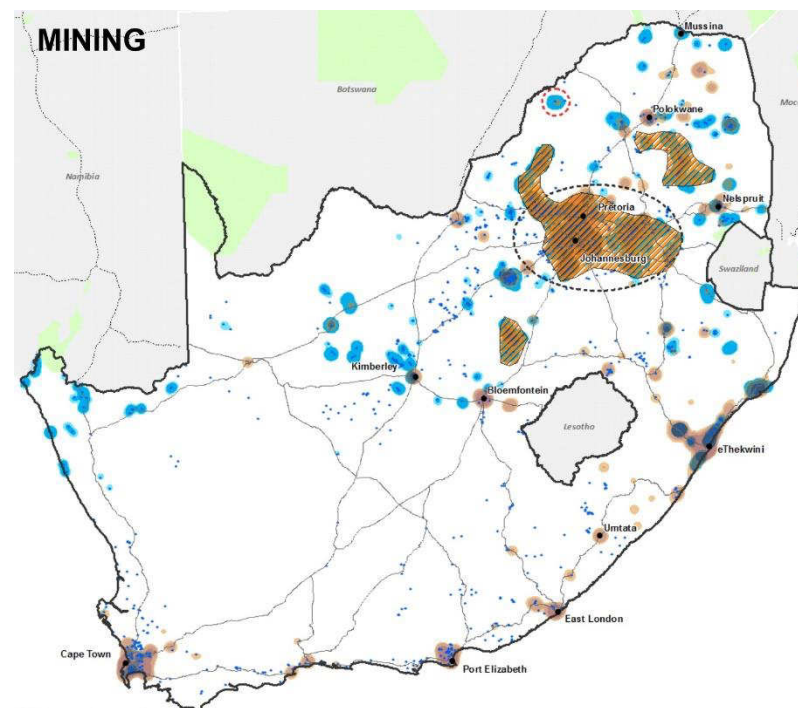
Currently, our national economy is heavily natural resource-extraction based, with mining and coal-based energy generation key contributors to our national GDP. The NDP supports a move away from coal-based energy generation in line with international trends and climate protocols. Long-term spatial and infrastructure planning must be cognisant of this move, and a collectively and carefully planned, well communicated and stakeholder-sensitive transition, including social, spatial and economic mitigation of the impacts of the move, will have to be undertaken.

While still important, mining is set to shrink in terms of its contribution to the national economy and undergo 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. Areas where these 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 cases where (1) climate change and (2) lack of or highly limited opportunities mean that there are no viable economic alternatives to mining, resettlement to places with viable, sustainable economies will need to be planned and facilitated.

The shift to greener energy and more high-order, low energy manufacturing and service-based economic activities, is not only expected to lead to job losses, but also significant job creation and higher levels of economic activity in mega urban regions.

(See **Figures 21 and 22** overleaf)

Figure 22: Mining^{xxi}



CURRENT INFRASTRUCTURE:

-  Coal-fired power stations
(cluster - diversification / transition)
-  Biomass power
-  Gas Turbine
-  Hydroelectric
-  Landfill Gas Power
-  Nuclear
-  Gas Pipelines

- Active Mines
- Mining Focus Areas
- Main Economic Areas

3.9 Conclusion: Development Context

The key challenges presented by the development context of South Africa are:

- Finding space to accommodate 20 to 25 million additional people by 2050, in the context of a shrinking productive and habitable land area due to climate change trends;
- Supporting the shift to a greener, more service-based economy through compact, connected settlement patterns and supportive infrastructure development;
- Managing competition between human activity, critical ecosystems and the scarce essential services they provide, e.g. water, energy and land for food production;
- Optimising the economic and employment benefits of social service provision, while at the same time improving the quality of life of people and building human capability in support of the economy;
- Providing redress to communities suffering the negative consequences of the past, and ensuring that all people will share in the benefits of economic growth; and
- Developing rural regions, with a view of ensuring high efficiency, connectivity and productivity, especially the eastern regions which are becoming more critical as national water source areas and agricultural areas.

PART FOUR: THE NATIONAL SPATIAL DEVELOPMENT LOGIC

4.1 Introduction

A key driver in the NSDF's theory of change is the move from a *national spatial development logic* based on and in service of the colonial and Apartheid development paradigms, to one based on and in service of a *Post-Apartheid development paradigm*. In this regard, it is framed and guided by:

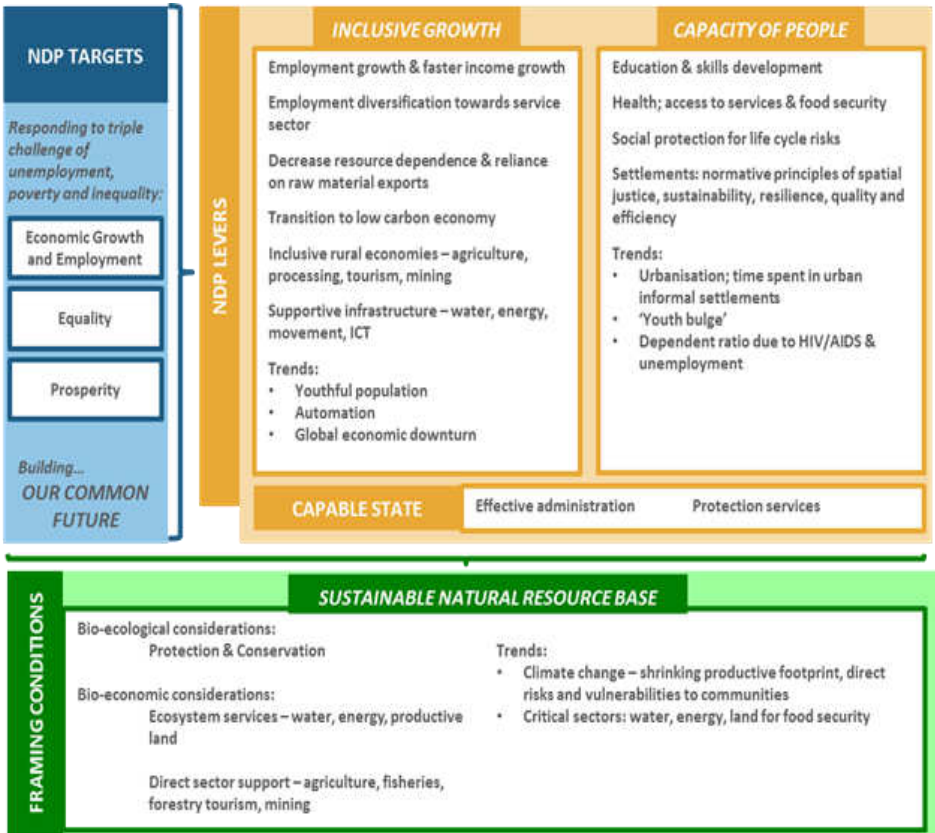
- The NDP targets, strategic levers and strategic policy direction; and
- The five normative principles as provided in SPLUMA.

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

4.2 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, can be summarised as indicated in **Figure 23**.

Figure 23: The NDP Levers and Objectives-Framework



The spatial implications of the strategic direction provided by the NDP can be interpreted as follows in **Section 4.2.1** to **Section 4.2.3** below:

4.2.1 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 new settlement development, housing provision, transport, and service network decisions accordingly;
- Increase access and remove barriers to the often concentrated and barricaded benefits of the national resource base, and the locational benefits of places historically 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 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.

4.2.2 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 its locality 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 and place-specific 'government service-offering 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.

4.2.3 With regards to a Capable State

A need to:

- Recognise and use spatial planning as a tool for transformation, and 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 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 spatial planning 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:

4.3.1 *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.

4.3.2 *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 use and wastage of natural resources and state finances and the need for motorised transport.

4.3.3 *Spatial Resilience*

A need to:

- Proactively minimise risks to settlements through 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.

4.3.4 *Efficiency*

A need to:

- Optimise the use of all state and non-state resources and the minimisation of wastage and negative impacts in settlement location and spatial forms; and
- Diversify and densify settlements to reduce transactional costs and the need for motorised transport;

4.3.5 *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, to 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.

4.4 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 Spatial Development Pattern*:

4.4.1 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; and
- Ending the development of barricaded, privileged 'luxury life-style' enclaves on national, regional and local scale.

4.4.2 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.

4.4.3 With regards to the nature, function and performance of our settlements

- Recognising and developing urban areas as engines and drivers of radical transformation at scale, especially by unleashing the enormous growth 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) domestic and international tourism.
- Recognising the future-proofing of cities as sites of human innovation in becoming active participants, and not victims of the 4th Industrial Revolution and the era of Artificial Intelligence (AI);
- Optimising the dividend of the millions of young South Africans that will be entering higher education and (1) gaining new experiences and novel insights, (2) developing new forms of knowledge, and (3) 'making sense of and acting in, and responding to the world';
- 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;
- Recognising our settlements as 'our new gold' – 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 resource-extraction driven economic model;
- Emphasising the need to develop a new kind of city that is a hub for knowledge-creation, learning and innovation, culture, entertainment and tourism, and in which public space can become a key driver of a new 'people's economy from below';
- Reframing the old logic of cities as 'engines of growth' in service of capital, to *cities as engines of inclusive, people-focused, people-driven development and transformation*;

- Providing quality education and social support to the growing youth sector.
- Pursuing a denser, smaller, polycentric system of settlements that has (1) a smaller footprint, and (2) spans urban and rural areas; and
- Making a clear distinction between the roles and capacity of different types of settlement on the national settlement network.

4.4.4 *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 and development of regional development anchors in rural areas, to (1) connect urban to rural areas in mutually-beneficial ways, (2) act as catalysts for regional-rural development, and (3) develop a polycentric network of smaller rural service towns to ensure public service provision, local economic development and far greater levels of rural-to-rural interaction and 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 malls*, which at core are little more than 'one-sided-extraction transaction points'; and
- Pursuing greater resilience of rural areas through higher complexity and diversification levels, in so doing ensuring that they are not 'single-economic sector' places.

4.4.5 *With regards to the nature, significance, form and impact of spatial development planning*

- Ensuring greater coordination, integration and collaboration in spatial development planning in and between the spheres and sectors of government, including the use of (1) spatial targeting, and (2) differentiated responses to the potential 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 economy in mind;
- Placing a greater focus on the developmental impact of national investment and spending initiatives on the well-being of sub-national regions and local communities;
- 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.

PART FIVE: THE NATIONAL SPATIAL DEVELOPMENT VISION

5.1 Introduction

The **National Spatial Development Vision** is derived from the **National Development Paradigm**, with as its key pillars (1) the Constitution and the NDP, (2) the **National Spatial Development Logic**, and (3) the Post-1994 legal and policy framework. Its purpose is to provide a long-term guiding light for realising our desired **Post-Apartheid Spatial Development Pattern**.

In addition to the more eternal long-term National Spatial Development Vision and accompanying Mission statement, a time-bound 2050-National Spatial Development Vision is provided to make (1) the future more tangible, and (2) our infrastructure investment and development spending actions more measurable. As such this 2050-vision seeks to:

- Provide high-level spatial guidance and direction to all national sector departments, provincial governments, municipalities, SOEs, and all other role players in planning, budgeting and investment actions;
- Contribute to bringing about transformation and development impact at scale through decisive national spatial targeting;
- Assist in pro-actively identifying priority national intervention areas for 'urgent spatial development and spatial management action' by a multiplicity of role players, to utilise opportunities for change and enable adaptation at scale; and
- Provide a timeframe against which to undertake spatial accountability assessments.

Figure 24: Vision Statement



5.2 The Long-Term National Spatial Development Vision and Mission Statement

In pursuit of our overarching goals of *redress, equity, unity and connectedness*, the eternal National Spatial Development Vision Statement reads as follows:

“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”

5.3 A 2050-National Spatial Development Vision

75 Million South Africans

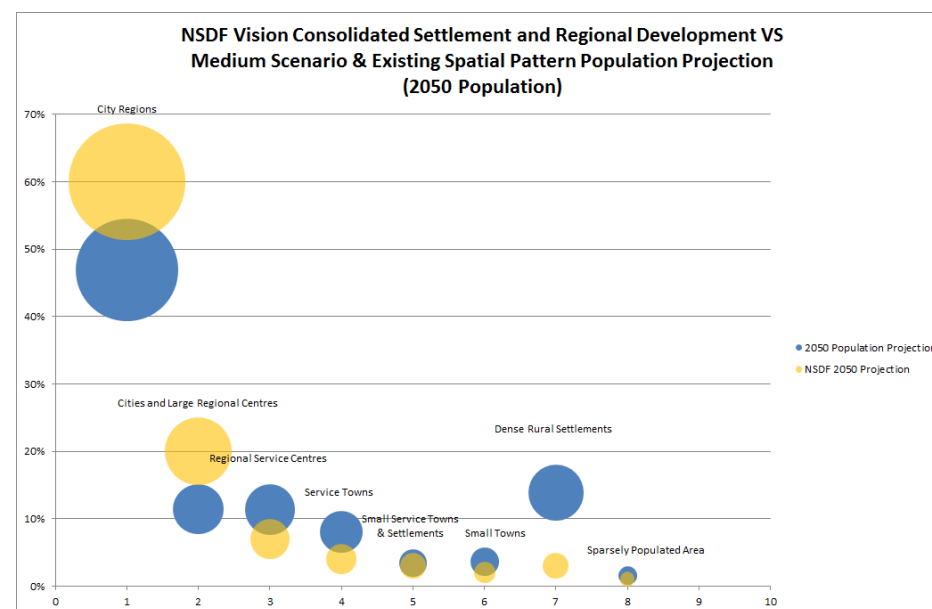
It is April 2050. A year earlier, during South Africa's 55th '27 April-Democracy Celebrations', the 75th million South African was born in the Buffalo City Mega-City Region. This massive urban conglomeration, is one of the 'big four' mega-city regions along the South African East Coast, that are now jointly home to more than 8 million South Africans. These four mega-city regions have grown rapidly; their growth equalling that of the Cape Town Mega-City Region, with its more than 6 million inhabitants. Despite their rapid growth, they are still a long way off from the Gauteng Mega-City Region with its population of more than 22 million people. Together with the booming Polokwane, Mbombela, Rustenburg, Msunduzi and Mangaung Mega-City Regions, each with their populations of around 1 million people, the 11 Mega-City Regions are now home to around 42 million people, or around 56% of the South African population (see **Figure 25**).

11 Mega-City Regions

In contrast to days gone by in which large parts of metropolitan South Africa were described as dreary, dead and boring, these areas are now hives of activity. Three-to-six storey mixed-use buildings are the norm in the buzzing former inner 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. Sometimes they are used

for solar and wind energy generation, alongside a myriad of other ways of doing so on buildings and verandas, and in larger commercial formats on high-lying areas and in the ocean alongside the numerous thriving aquaculture projects.

Figure 25: National Development Pattern Transformed



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-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

down 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 interior 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, government acted swiftly and decisively. And now, 25-30 years on, this is the outcome.

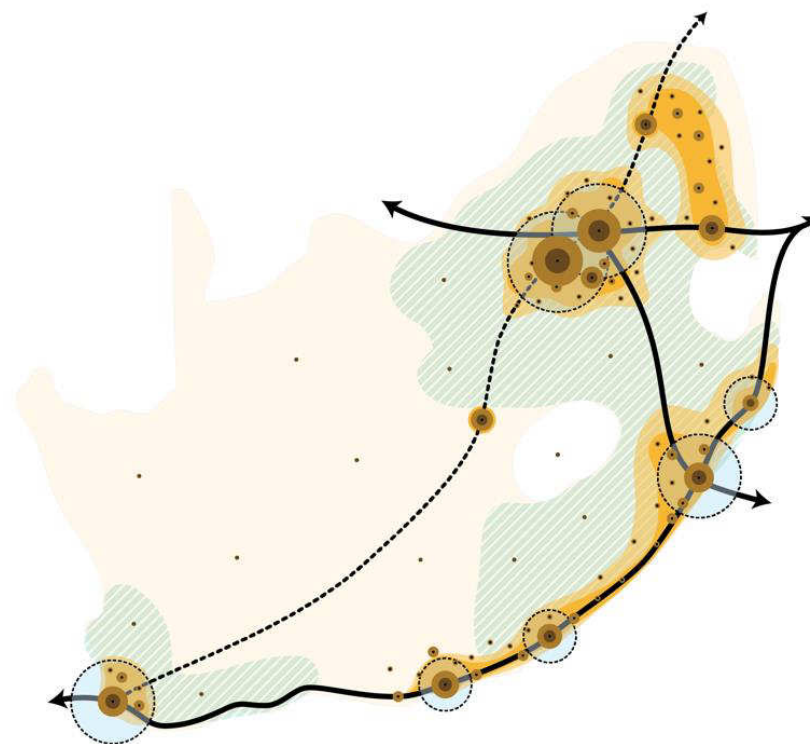
Transformation at Scale

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 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 used as intended, and respected by government, communities and the private sector.

In addition to the positive impacts the macro-restructuring and development plans had on the 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 interplay between government investment, nightlife, innovation and organic urban growth and land development by communities and the booming SADC region. It is especially this regional bloc and the connections and free flow of goods, services and people that has 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.

Figure 26: A Spatial Vision for a Consolidated and Connected South Africa



Life on the streets of urban South Africa is very different to the first two decades of the 2000s. The streets are filled with people and there is excitement in the air. In contrast to those days there are far fewer cars in

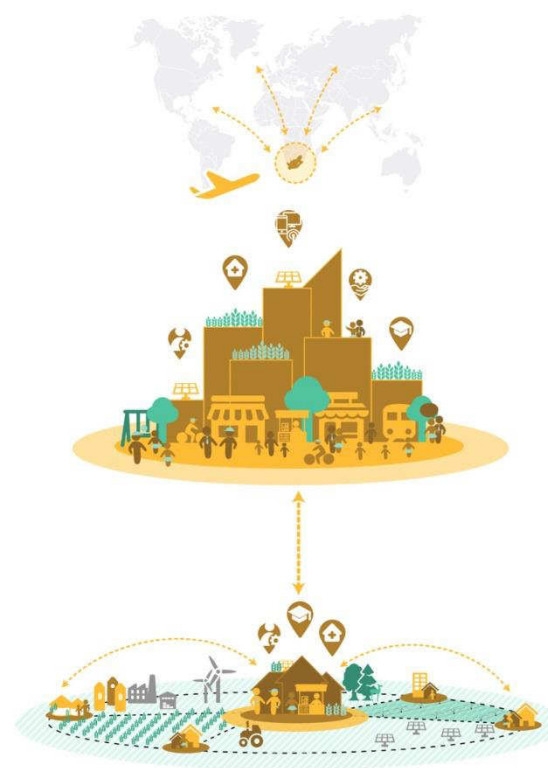
the streets, and all you hear is people's voices and music – walking and cycling are now the most popular means of getting around, and the electrical buses and taxis barely make a noise. Instead of pavements packed with cars, there are many small places to eat, salons where you can have your hair done, little shops selling anything from fresh products to health foods, research, education and innovation institutes, where knowledge and ideas flow freely, and 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 80% 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 meets – where you see faces and hear languages from all over the planet. Many of those are tourists who love the unique 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 now. 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.

Rural South Africa is also in a very different shape to what it 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 and 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 transforming small towns in rural areas into government service nodes. In every one of the carefully selected small towns, government provided at least one clinic, a police station, schools, arts and culture academies and sporting facilities, and lightning-fast communication networks. Tens of thousands of graduates deployed as interns, researchers, and tutors to rural schools, also assisted in making these plans a success. Trade connections between smaller places in rural South Africa grew, and 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 were given a strong and stable cash injection.

Today, 56 years into democracy, South Africa is finally beginning to enjoy the full dividend of (1) freedom, and (2) the energy of its many young people, as well as the infusion of the creative energies of people from the rest of the continent and the world.

Figure 27: Making a Living in High Quality Places



PART SIX: THE DESIRED NATIONAL SPATIAL DEVELOPMENT PATTERN AND PRIORITY ACTIONS

6.1 Purpose and use of the frames

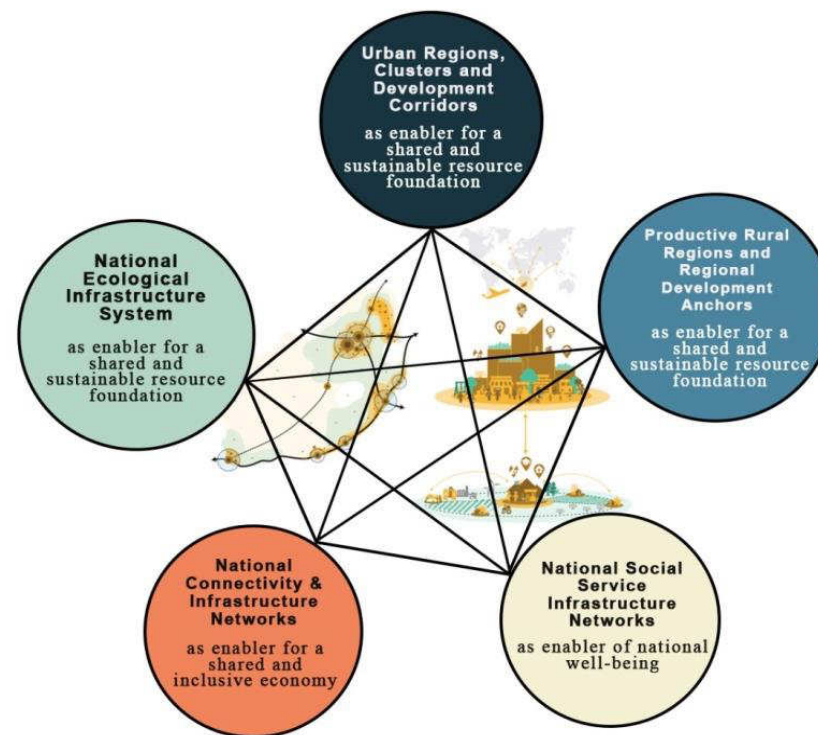
The NSDF introduces five **National Spatial Development Frames** that set out the desired future **National Spatial Development Pattern** for South Africa in 2050. In line with the purpose and role of the NSDF as outlined in **Part Two**, these frames provide:

- A national spatial schema to **inform, direct 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-Spatial Vision and our core national development goals;
- 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 all 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; and
- A *spatially-explicit assessment and accounting tool* 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).

These frames spatially direct the *targeted and collective* use of the plans, budgets and actions of a wide range of public and private sector actors to, over time:

- **Capitalise** on key national spatial assets, locational potentials and agglomeration opportunities; and
- **Bring about** decisive, rapid, sustainable and inclusive national development and transformation at scale.

Figure 28: Five Frames to Achieve our Desired Future Spatial Pattern



6.2 Rationale for frames

The frames were constructed in accordance with the **National Development Plan's Priorities, the National Spatial Development Vision and Logic** and after careful consideration of the following themes and issues as highlighted in **Part Three**):

- Key national spatial development realities and national and international trends, movement patterns and technological advances, and (1) the opportunities they offer, and (2) the challenges and threats they present;
- An envisaged growth in our national population of between 20 and 25 million by 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) safe-guard 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 form and seasonal pattern of rainfall.

The five **Frames** (see **Figures 31, 33, 35, 36 and 37**) are:

- **Frame One: Urban Regions, Clusters and Development Corridors as the engines of national transformation and economic growth:**

*To focus and sustain national economic growth, drive inclusive economic development and derive maximum transformative benefit from urbanisation and urban living (see **Figures 29 and 30**);*

- **Frame Two: Productive Rural Regions and Regional Development Anchors as the foundation of national transformation:** *To ensure national food security, rural transformation and rural enterprise development and quality of life in rural South Africa through a set of strong urban-rural development anchors in functional regional-rural economies (see **Figures 31 and 32**);*
- **Frame Three: National Ecological Infrastructure System as enabler for a shared and sustainable resource foundation:** *To protect and enable sustainable and just access to water and other national resources for quality livelihoods of current and future generations (see **Figures 33 and 34**);*
- **Frame Four: National Connectivity and Economic Infrastructure Networks as enabler for a shared, sustainable and inclusive economy:** *To develop, expand and maintain a transport, trade and communication network in support of national, regional and local economic development (see **Figure 35**); and*
- **Frame Five: National Social Service and Settlement Infrastructure Network in support of national well-being:** *To ensure effective access to the benefits of high-quality basic, social and economic services in a well-located system of vibrant rural service towns, acting as urban-rural anchors and rural-rural connectors) (see **Figures 37 and 38**).*

In **Sections 6.3 to 6.8** below, each of the Frames is dealt with in detail, with a focus on: (1) developmental significance, (2) strategic national spatial development guidance, (3) associated high-level national spatial development priority areas, and (4) game-changing actions required.

6.3 Frame 1: Urban Regions, Clusters and Development Corridors as Engines of National Transformation and Economic Growth

6.3.1 Developmental significance

With nearly 80% of South African's population already living in cities and towns, and more than half of its people in metropolitan regions and cities, the core network of cities and towns will play an increasingly important role in the future development of a sustainable and shared South Africa.

The NSDF supports the growth, establishment and maintenance of the kind of economy South Africa needs by 2050, by creating the necessary spatial efficiencies through agglomeration, land release and effective settlement design. The interrelated processes of (1) establishing the desired national spatial development pattern, and (2) densification, diversification and public place-making in towns and cities must, however, begin now.

Future growth scenarios (CSIR, 2018: Population Projections) not only point to an expected significant increase in the national population, but also significant urbanisation and growth in the national urban core regions and inter-connected development corridors.

The NDP presents a development vision for national urban core regions as spaces and places of national significance, where (1) people and economic activity concentrate, (2) high density social networks develop, and (3) people access higher-order services. Similarly, 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." The NSDF shares this positive view of connected core urban regions and large cities as crucial enablers of the realisation of our national development objectives, and argues for:

- Sustaining, supporting and growing centres of national and regional productive capacity, industrialisation, employment and enterprise establishment and growth;
- Doing far more in these areas to ensure inclusive economic growth, spatial transformation and collective well-being; and
- Supporting (1) sustainable urbanisation, (2) dense, diverse and more compact settlement growth, (3) the development and strengthening of connecting corridors, and (4) effective service delivery against the backdrop of significant population growth, infrastructure provision and maintenance challenges, climate change, and increasing pressures on scarce natural resources.

The national spatial significance and 'frame logic' of these areas for catalytic and transformative impact is outlined in **Figure 29**. Given the expected population growth and impact of climate change and the expected critical role that the natural resource foundation in the central and eastern parts of the country will play in future, it is foreseen *that a network of city regions, large cities and large regional towns along the coast and in a number of inter-regional corridors, will in all likelihood be home to almost 80% of South Africa's population.*

The NSDF proposes the development of 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 services and housing types; and
- Become the engines and drivers of national transformation.

In terms of settlement types on this network, the NSDF proposes that:

- Large national **core urban areas** act as nodes and national and global gateways for trade, tourism and national political functions;
- A series of *large urban-rural nodes* act as **regional development anchors** with significant rural-regional reach in terms of service economy, tourism, services and administrative functions; and
- A set of well-connected **smaller towns and rural service centres** ensure mutually beneficial *urban-rural* and *rural-rural* linkages.

Corridors are regarded as important spatial development instruments that develop between, and connect strong nodes. Such corridors also focus and channel economic flows and enhance settlement development in, and along the network. However, to do so, there is a need for:

- Broader, multi-sectoral and intergovernmental supporting strategies at all three spheres of government; and
- A focus in corridor development on (1) supporting and (2) strengthening agglomeration economies.

High-density urban core areas provide opportunities for interaction, innovation and enterprise development within existing, as well as new economies. They also require management practices that recognise the collective impact of household and business-level consumption, behaviour (notably in the areas of waste generation), and ensure

sustainable (1) development of the built environment, (2) service delivery, (3) use of energy and water, and (4) consumption of food.

The **Spatial Development Logic** of the frame is annotated in Figure 29. The frame raises awareness of the significance of the system of national urban core regions to achieve the national development objectives as outlined in the NDP, and to bring about the **National Spatial Development Vision** and desired **National Spatial Development Pattern**, as outlined in this NSDF.

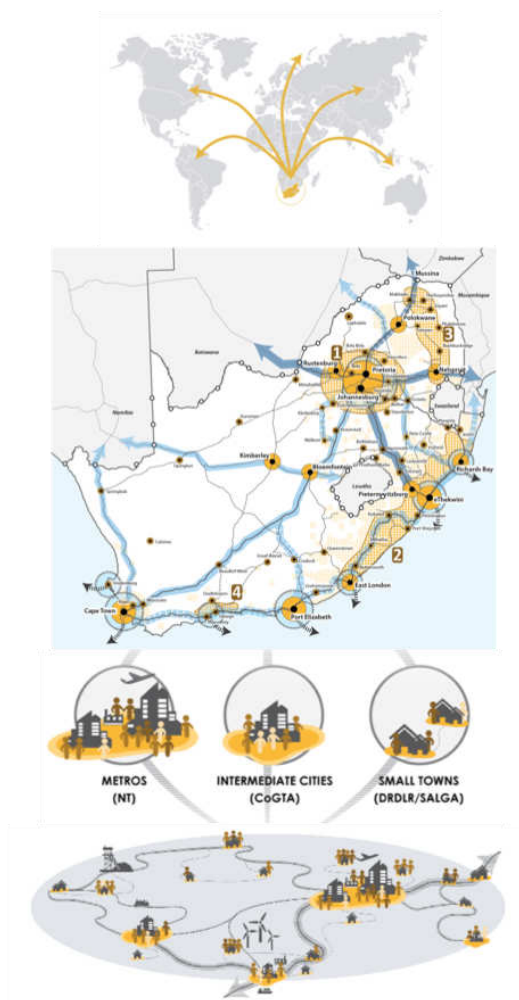
6.3.2 Strategic National Spatial Development Guidance

National spatial development guidance to ensure and sustain national economic growth, drive inclusive economic development and derive maximum transformative benefit from urbanisation and urban living, is set out in **Figure 30**.

The **Guideline Table** (Table 3 below) provides spatial guidance and focus to all role players in the national space with regards to “what we should start doing”, “what we should stop doing” and “what we should continue doing, but do more of, do better, or do less of”.

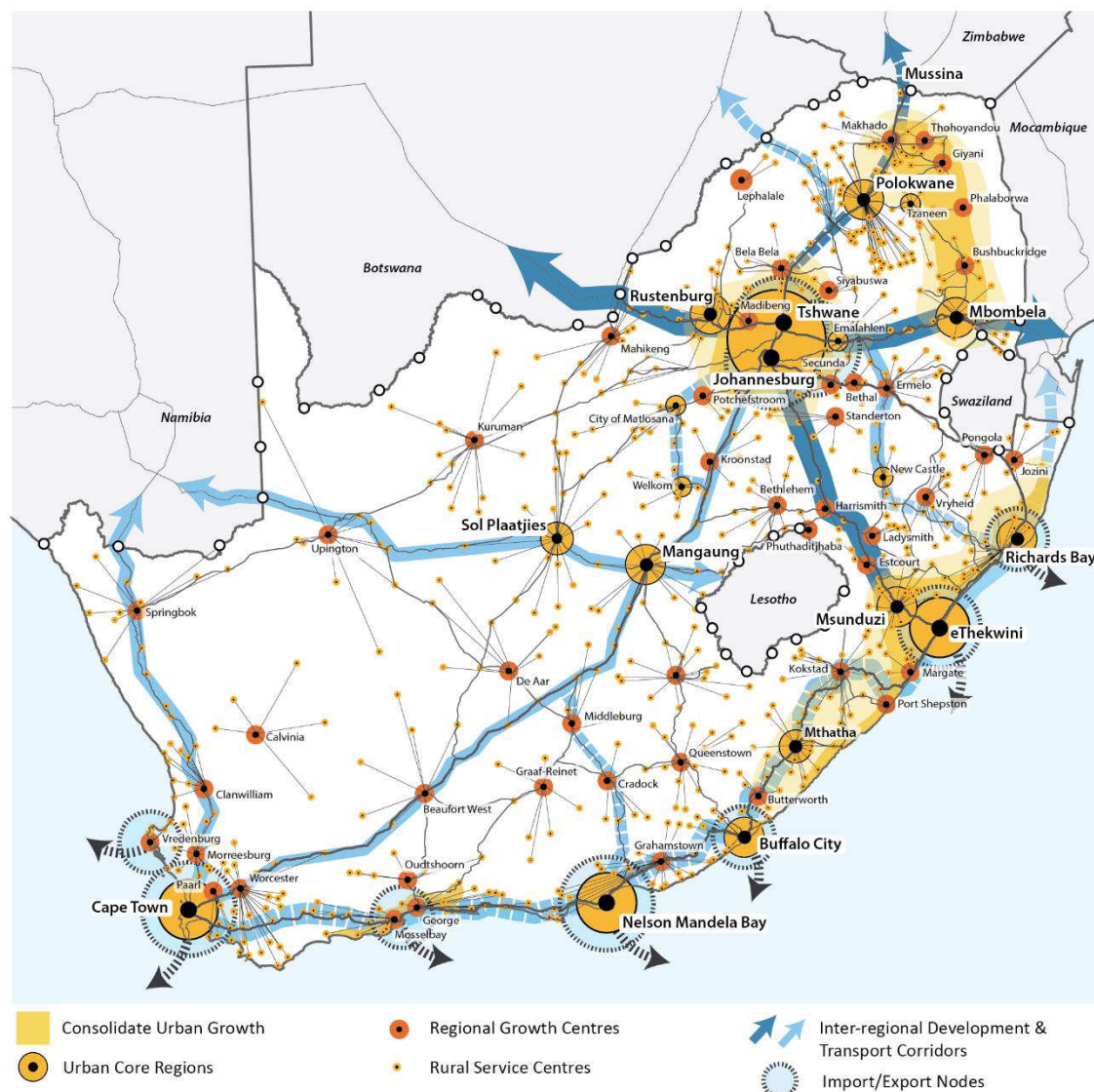
Figure 29: Frame 1- National Spatial Significance and Frame Logic: Regionally Connected National Urban Core Regions as Engines and Drivers of National Transformation

National Spatial Significance and Frame Logic: Regionally connected national urban core regions as engines and drivers of national transformation




1. National urban core areas are the key global and regional gateways and drivers of innovation and job growth globally, as well as in the Southern African region and South Africa.
2. International investment and trade in South Africa and Africa, even though it may be directed at more rural resource-rich enclaves (e.g. mining areas) requires and utilises metropolitan and large urban areas and port cities as gateways and springboards.
3. It is important to establish and sustain a well-functioning network of global and inter-regional (SADC) gateways and development networks, linked to well-connected national and regional networks, rural-urban anchors and rural-rural networks.
4. Urban cores provide the opportunity for growth of diverse, sustainable people-based and inclusive economies and enterprises.
5. Strengthening and expansion of existing network of gateways, ports and corridors with a specific emphasis on expanding inter-regional linkages is imperative.
6. With global shifts in job creation possibilities from mining, agriculture and manufacturing, and about 26% unemployment within its urban core areas, South Africa needs to realise the urban dividend by building and expanding manufacturing/construction fast, and in parallel, leapfrog to a human capability, technology and green energy based economy. The latter will require significant human capital development and investment in high quality education and well-being at scale.
7. Urban core regions will be expected and supported to act as engines and drivers of transformation: This includes providing access to housing and land and diverse tenure and ownership models. To facilitate inclusive growth would require spatial restructuring within existing centres, but also consolidation of urban core regions and transformation of a national land locked and highly dispersed settlement pattern, through a range of transformative choices for current and future generations.
8. High-quality service delivery, physical transformation of places (inclusive cities), as well as encouragement of enterprise development related to alternative energy, housing and basic service provision, as well as urban agriculture related enterprise development within a network of core urban regions are to be used to drive infrastructure and construction sectors as well as multiplier effects, well-being economies.


Figure 30: Frame 1- Critical Role and Strategic Focus Areas: Urban Regions, Clusters and Development Corridors as Engines of National Transformation

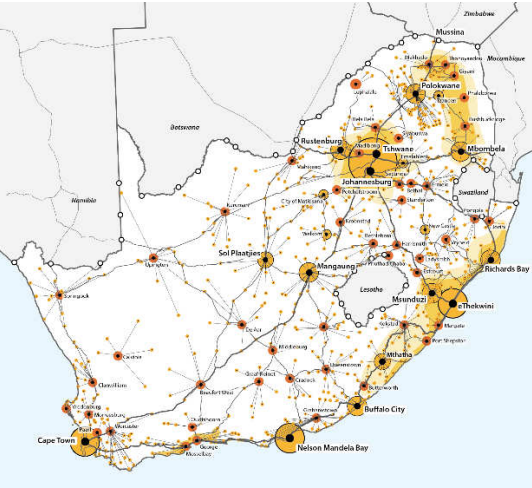


- Urban Regions:**
Role: (1) Global gateways. (2) Engines of transformation, inclusive economic growth and well-being.
- Strategic Action Areas:**
 1. Bigger Gauteng Urban Region and surrounding urban-innovation belt, 2. eThekweni Urban Region, 3. Nelson Mandela Bay Urban Region, 4. Cape Town Urban Region, 5. Buffalo City Urban Region
- National Urban Clusters and Corridors:**
Role: (1) Reaping the urban dividend to create urban livelihoods. (2) Centres of human capital excellence and innovation, inclusive green economies and regional enterprises. (3) Trade.
- Strategic Action Areas:**
Multi-nodal urban clusters: 1. Mbombela 2. Polokwane 3. Bloemfontein 4. Richards Bay; 5. Mthatha.
Urban Corridors: 1. eThekweni-Mar-gate-Port Shepstone; 2. George-Mossel Bay)
- Inter-Regional and National Development Corridors and Routes:**
Role: (1) Consolidated development. (2) Trade.
- Strategic Action Areas:**
 1. Mozambique-Gabarone Corridor (N4)
 2. Eastern coastal Corridor (N2)
 3. Gauteng-Durban Corridor
 4. Emalahleni-Richards Bay Corridor
 5. Gauteng-Welkom
 6. Other key routes - N1, N14, N7

Table 3: Frame 1- Spatial Guidance and priority Focus Area: Urban Cores and Corridors as Engines of Transformation Guidelines

NSDF FRAME 1: URBAN REGIONS, CLUSTERS AND DEVELOPMENT CORRIDORS AS ENGINES OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	PRIORITY SPATIAL FOCUS AREAS
<p>1.1 Urban core regions as international and national development gateways</p>  <p>See Annexure: Frame 1 for legibility and spatial description</p>	<p>Develop urban core regions as sustainable centres of well-being, international trade, business and tourism gateways, and engines of transformation.</p>	<ul style="list-style-type: none"> Consolidate urban growth in a network of more compact, densified and diversified urban core regions. Consolidate and expand national competitive advantages and enhance the resilience of national urban cores. 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. Maintain and strengthen international trade, ports, transport, through-routes and related infrastructure. Support international competitiveness through efficiency improvement on major national road and rail freight routes. Prioritise rail system re-development Support diversification of economies, tourism, the knowledge economy, the entertainment industry, the green economy and alternative energy-related enterprise development. Manage demand and maintain, expand and refocus our infrastructure network to enable and sustain bulk water supply and energy distribution Use effective land administration and urban land reform to guide and manage the interface between settlement, land-use and infrastructure planning in fast growing cities. Focus on place-making principles and green economy solutions. 	<ul style="list-style-type: none"> The Greater Gauteng Urban Region and surrounding urban-innovation belt, eThekweni Urban Region, Nelson Mandela Bay, Cape Town Urban Region, Buffalo-City Urban Region <p>Maintain and strengthen key regional corridors – see also NSDF Frame Four below.</p>

NSDF FRAME 1: URBAN REGIONS, CLUSTERS AND DEVELOPMENT CORRIDORS AS ENGINES OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	PRIORITY SPATIAL FOCUS AREAS
<p>1.2 Inter-regional development and transport corridors</p>  <p>See Annexure: Frame 1 for legibility and spatial description</p>	<p>Consolidate growth and prioritise economic development and trade infrastructure and activities within well connected inter-regional and national development corridors and routes.</p> <p>Enhance efficiency and extend enabling ecological, connectivity (trade) and social service infrastructure (see NSDF Frames Three, Four and Five below).</p>	<ul style="list-style-type: none"> • 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. • Strengthen trade and flows on existing corridors to assist in the strengthening of the cities and towns on the corridor. • Focus on both (1) corridor development and strengthening, and (2) intra-national, and supranational economic integration. 	<ul style="list-style-type: none"> • Inter-regional development corridors: the Mozambique-Gabarrone Corridor (N4); the Eastern Coastal Corridor (N2); and the Gauteng-Durban Corridor (N3). • National Connectivity Corridors: the N1, the N3, the N14 and the N7. • Explore potential development corridors and anchors in the Emalahleni-Richards Bay Corridor; and the Gauteng-Welkom Corridor.

NSDF FRAME 1: URBAN REGIONS, CLUSTERS AND DEVELOPMENT CORRIDORS AS ENGINES OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	PRIORITY SPATIAL FOCUS AREAS
<p>1.3 Urban growth and transformation in national network of growing urban clusters and corridors</p>  <p>See Annexure: Frame 1 for legibility and spatial description</p>	<p>Consolidate urban growth in future growth regions and corridors in the central, coastal and eastern regions of the country.</p> <p>Support, improve, expand and maintain the corridors that link our national urban cores.</p> <p>Enhance efficiency and extend enabling ecological, connectivity (trade) and social service infrastructure (see NSDF Frames Three, Four and Five below).</p>	<ul style="list-style-type: none"> Consolidate and direct vibrant and sustainable urbanisation in the fast-growing eastern network of national urban clusters and corridors, reaping the urban dividend to create urban livelihoods, centres of human capital excellence, innovation, trade and inclusive green economies and regional enterprises. Consolidate the capacity of fast-growing and emerging secondary urban cores and settlement corridors to act as anchors for regional and rural development. 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. Maintain and upgrade road and rail routes. Prioritise rail and improve the affordability of intercity public passenger transport. 	<p>Consolidate and focus growth and economic transformation within the central innovation and mining belt, along the coastal corridors and within the eastern escarpment areas in multi-nodal urban clusters: Mbombela, Polokwane, Mangaung, Richards Bay and Mthatha.</p> <p>Support and consolidate Urban corridors along the coast”: eThekweni-Margate-Port Shepstone, and George-Mossel Bay.</p>

6.3.3 Frame 1: Priority interventions required to mitigate risks and kick start action

To prepare for a growth in the urban population of an additional 20 to 25-million people in the next 30 years, requires intervention and service delivery at scale.

In **summary**, the necessary interventions are as follows:

- Develop urban core regions as sustainable centres of well-being, international gateways, and engines of national transformation: *Do better*;
- Consolidate growth and prioritise development within and priority development and transport corridors: *Do more of and do new things*; and
- Consolidate Urban Growth, as well as growing rural-urban anchor network in growth regions and corridors: *Do new things*.

The immediate **high-priority actions** are:

- **Actively explore and direct national urbanisation towards the eastern half of the country** where temperatures, water availability and access to smallholder farming and urban agriculture for food security will be more favourable. In this regard, the development and consolidation of strong urban cores in the east coast region, with a specific focus on former Bantustan towns as nodes is crucial to consolidate growth in (1) identified urban core regions, and (2) eastern coastal cities.
- **Mitigate risk in high-density, fast growing cities in the Central Innovation and Mining Belt**, where economic diversification, transformation and reskilling are required to ensure a phased transition into a/the new economic reality.

- **Sustainable development, and water and food security in Mega-City Regions as national priority.** This entails the management of large-scale urbanisation in those cities and towns that will over the medium-term be the recipients of significant numbers of new inhabitants. To support, sustain and strengthen these '*gateways for migrants in to the national economy*', the NSDF calls for:
 - A strong and functioning *polycentric system of well-connected nodes and functional urban regions* that offer a wide range of high-order medical, education, government, safety and security services and housing types. These areas need specific mechanisms to (1) enable higher densities, (2) provide suitable housing choices, (3) alleviate pressure on basic and social service provision, (4) undertake and expedite urban land reform, (5) support skills development in growing economic sectors, and (6) focus on youth development and employment at scale.
 - An in-depth exploration of the long-term impacts of climate change on liveability, urbanisation, and national spatial development patterns, e.g. (1) concentration towards the east of country, (2) increased pressure on long-distance distribution of water and the availability and cost-implications of alternative water sources (e.g. reuse/recycling and desalination), (4) food production, and (5) low/no-carbon energy generation.
 - Support for growing economic sectors in urban areas, i.e. the service and tertiary sectors.
- **Explore the potential for new economic growth corridor development on identified routes**, the Witbank/New-Castle to Richards Bay Corridor and the extension of the N2 Corridor in the eastern coastal region of the country.

Spatial accountability for national growth regions and interventions at scale will require joint accountability in terms of spatial outcomes, and phasing of coordinated transformation initiatives:

- *Urban areas experiencing large-scale urbanisation* will need (1) the support of initiatives such as the IUDF and the DHS Master Plan, with a focus on ensuring financial viability in human settlement development, and (2) regional scale collaboration with a strong focus on private sector and civil society involvement, as well as active involvement by city governments within the larger context of the NSDF implementation guidance provided in **Part Seven**.
- *Collaboration between long-term infrastructure planning and implementation* in support of sustainable national development, especially the phasing of such investment, will be critical. Coordinated phasing and re-evaluation of corridor development routes is important, to support the flow of people and goods, and not just mining-related resources. This necessitates harmonisation between the IPAP and NATMAP 2050-proposals and the NSDF.

Capacity shortfalls at regional and city-scale will need to be attended to by the national and provincial departments responsible for municipal and spatial planning. Support and monitoring will be important to ensure that development in these areas, as proposed and managed by Provincial and Municipal SDFs, actively contributes to the ability of these areas to become *a new generation of resilient and sustainable Urban Core Regions*.

6.4 Frame 2: Productive Rural Regions and Regional Development Anchors as Foundation of National Transformation

6.4.1 Developmental significance

Sustainable food security, rural transformation and agrarian reform (including reform of access to and use of land) are key to the well-being, health and livelihoods of the nation, as well as those depending on generating livelihoods within rural South Africa.

This **National Spatial Development Frame** provides strategic spatial focus areas for the differentiated rural development strategies as put forward in Chapter 6 of the NDP, and in terms of which agricultural development will play a key role in addressing poverty, unemployment and inequality. The Frame promotes differentiated developmental impact through a network of productive rural regions that serve as *a foundation of national transformation*. This foundation includes productive rural regions supported by Urban-Rural Anchors and Small Service Towns that support and provide access to economic, government and social services in the surrounding hinterland and provide links to the broader country. The broad spectrum of agricultural activity in South Africa, and the differentiated opportunities ranging from livelihood support, small scale farming at scale and national food production across a wide range of products, including game farming and agri-industries, means that this foundation will be equally diversified.

Given (1) the impact of technology, (2) job losses associated with large-scale farming practices, and (3) growing challenges related to water security, changes in crop and animal production and innovation related to the use of water and farming practices will need to form a critical

component of agrarian reform and enterprise development in productive rural regions.

National reliance on the central and eastern agricultural heartlands of the country for food security and agro-processing has already increased and will continue doing so, due to rising temperatures and increasingly arid conditions in the western parts of the country. The eastern agricultural heartlands will require specific attention to ensure optimal utilisation of available land.

The drive towards smallholder farmer support, agro-processing and the Agriparks, as put forward by the DRDLR, require a move away from an approach of 'transformation-from-above' to one of 'transformation-from-below' (see **Figure 31** below)².

National food security, sustainable rural development and agrarian reform that brings about transformation at scale, requires strategically directed and collaborative action to support a range of national 'bread and enterprise baskets', notably:

- The protection of high value agriculture land in the country's Central and Eastern Agriculture Heartlands – this is especially critical given that it is also the area with often dense levels of human settlement, and strong competition for land between different land-uses and users;
- The effective utilisation of Agri-Enterprise Regions to support agriculture production, agrarian reform, increased enterprise opportunities and beneficiation, and transformation that will enable climate change adaptation, alternative practice and ownership models, land administration, land capability

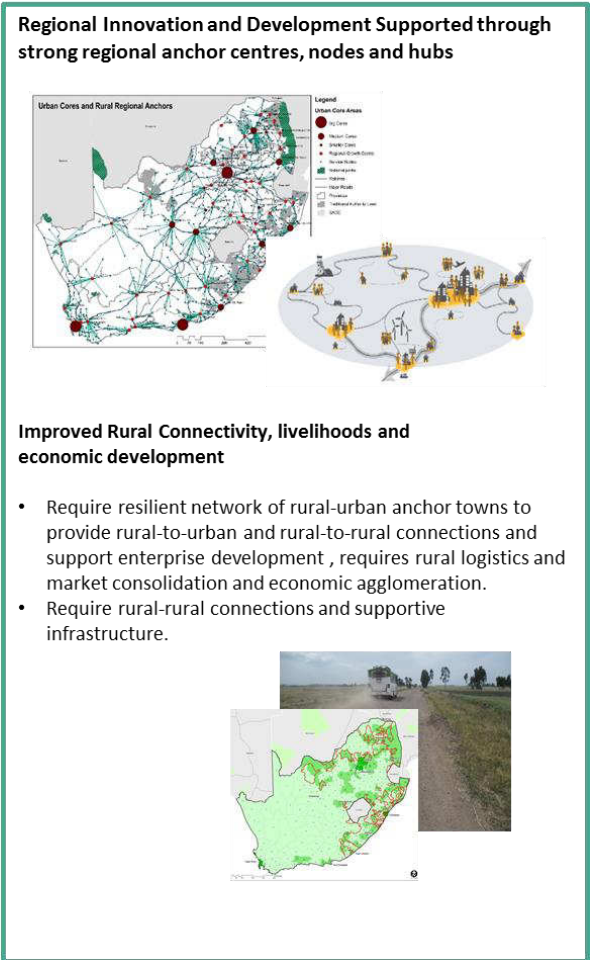
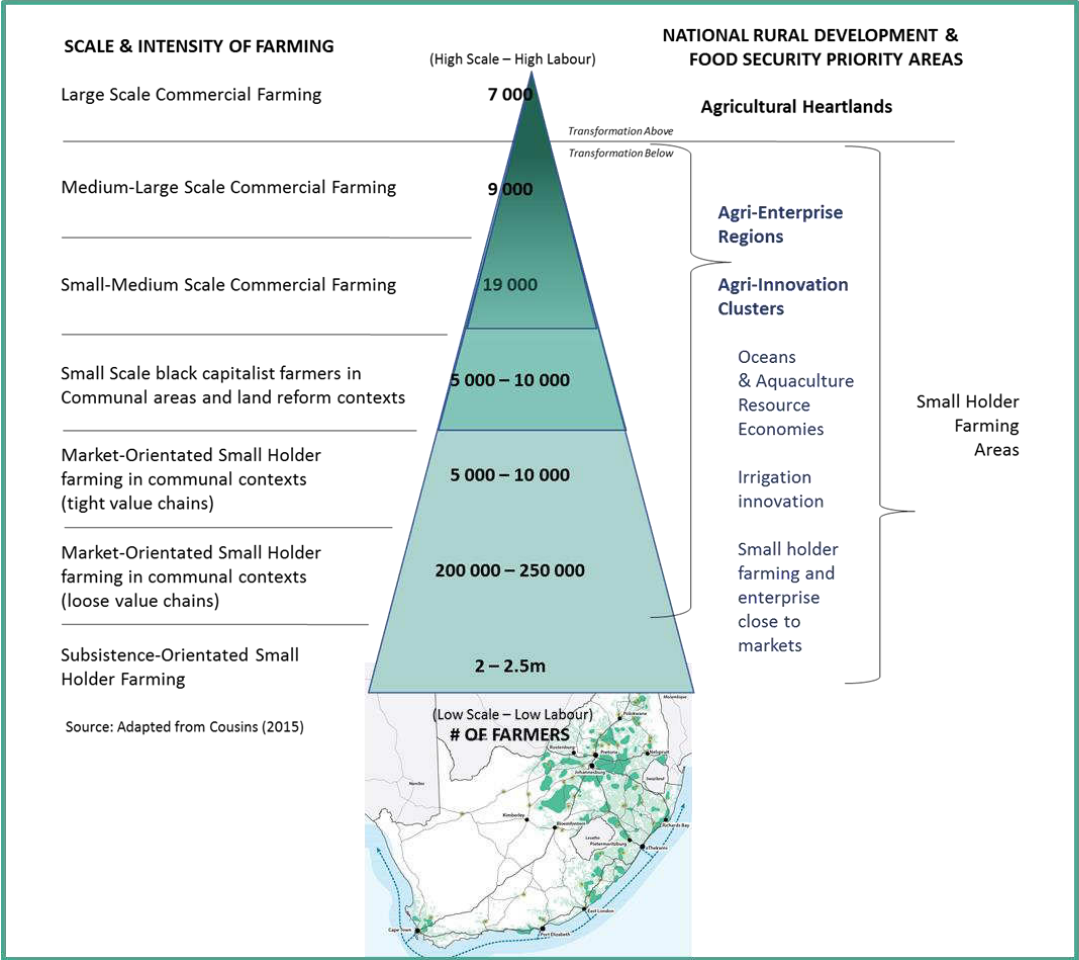
restoration and smallholder farming in location-specific contexts, including traditional authority areas;

- The roll-out of transformative practices and innovation in the sparsely populated and increasingly more-arid western parts of the country; and
- The development and effective use of productive *Agri-Innovation Clusters*, which entail:
 - The location of smallholder farming activities and enterprises close to markets, especially within 'Agri-Enterprise Regions';
 - Increased productivity in ocean and aqua culture resource areas; and
 - High-production irrigation and innovation to enable agricultural production in the arid west and increasingly arid central areas of the country.

² See Greenberg. 2013. Institute for Poverty, Land and Agrarian Strategies, UWC. Page 18, 19; See Cousins (2015), Aliber et al (2017).

Figure 31: Frame 2-National Spatial Significance and Frame Logic Productive Rural Regions Supported Through a Network of Regional Development Anchors

Frame 2: National Spatial Significance and Frame Logic: Productive rural regions supported through a network of regional development anchors as foundation for national transformation
- The role of agrarian reform and rural connectivity



In addition to agriculture as backbone of productive rural regions, the significant contribution of tourism, forestry, specific intense farming regions (i.e. sugar cane), mining, renewable resources, aqua and oceans' economies, etc. is of crucial importance in the development of productive rural regions. The development of such rural regions is also closely related to (1) well-functioning rural-rural connectivity, vibrant service and people's economies, sustainable and high-quality rural livelihoods, and (2) the development of a network of regional development anchors, as foundation of national transformation.

In terms of type, rural regions and livelihoods in South Africa can very broadly be described in terms of two spatial categories, i.e. (1) the more densely developed and settled eastern part of the country, and (2) the more arid, sparsely developed and remote rural hinterland.

A large proportion of the South African rural landscape is characterised and strongly influenced by **tribal areas** (18 % of the population resides in these areas, which cover 11.1% of the country's total land area). Tribal authority areas in South Africa are a complex spatial permutation of apartheid geography and large population groupings of similar communal ethnic heritage. In these spaces, the burdens of poverty and inequality have remained prevalent and widespread. As such, these areas are often associated with (1) disproportionate levels of poverty, (2) high unemployment levels, (3) poor access to services, and (4) tenure insecurity, when compared to the rest of South Africa. Addressing the many structural deficiencies and inefficiencies characterising tribal areas is a central motivation in the journey towards spatial transformation in South Africa. Sociological, spatial, natural environment and historic differences are vast. As significant human settlement and rural regions, urgent national priority attention is required to address the many challenges besetting the places and the people that call them home. Concerted efforts for regional specific developmental

interventions to support the creation of 'well-functioning functional rural regions' becomes increasingly important.

To effectively support the development of productive rural regions it is important to recognise the importance of a network of consolidated regional and rural nodes and markets to:

- Sustain the national economy;
- Protect and unlock the potential of the natural rural resource foundation; and
- Ensure rural-rural connectivity and connect these regions via rural-urban anchors in mutually beneficial ways to urban areas and economies.

The **focus** must therefore be on:

- *Consolidation* through maintenance, densification, increasing the reach, and ensuring efficiencies of scale, agglomeration and trade;
- Developing a *resilient and diverse network* of high-quality nodes, diversified and complex economies and multiple network connections by improving adaptation-options and lessening national and regional vulnerability; and
- Ensuring (1) shared use of the national economic base, and (2) the radical transformation of rural spaces and the national spatial development pattern away from their colonial and Apartheid pasts.

A cornerstone of the desired rural transformation resides in the development of Urban-Rural Anchors and Small Service Centres. This

intervention seeks to (1) radically transform rural livelihoods and (2) enable easy access to high-quality social services.

The spatial frame logic (see **Figure 32**) is that at least one 'Urban-Rural Anchor' is required to act as regional development anchor with the specific purpose of playing an active role in:

- Regional context-specific research and innovation;
- Productive knowledge enterprise development; and
- Ensuring strong connections to local rural hinterlands through a carefully selected set of prioritised rural service settlements.

The role of the Urban-Rural Anchor is strongly related to (1) creating a consolidated national settlement footprint, and (2) playing an active role in regional context-specific agrarian reform and rural productivity (see also **Frame Five: The National Social Service Infrastructure System**).

6.4.2 Strategic National Spatial Development Guidance

Spatial development guidance with regards to areas of national and regional significance to support transformation, national food security and agrarian reform in productive rural regions is set out in **Figure 33**. This figure also indicates the critical role and significance of *Regional Development Anchors that support Rural Hinterlands and Livelihoods*

This frame raises awareness of the importance of regions in attaining the national development objectives, as outlined in the NDP and bringing about the **National Spatial Development Vision**, as outlined in the NSDF (**Part Four**). It also raises awareness of the significance of the system of well-connected nodes and networks to (1) reach the national development objectives, as outlined in the NDP, and (2) realise the **National Spatial Development Vision** and desired **National Spatial Development Pattern**.

The guideline table (**Table 4**) provides spatial guidance and identified priority focus areas to all role-players in the national space with regards to "what should be done", "what we should stop doing" and "what we should continue doing, but do more of, or do better, or do less of".

Figure 32: Role of Urban-Rural Anchor

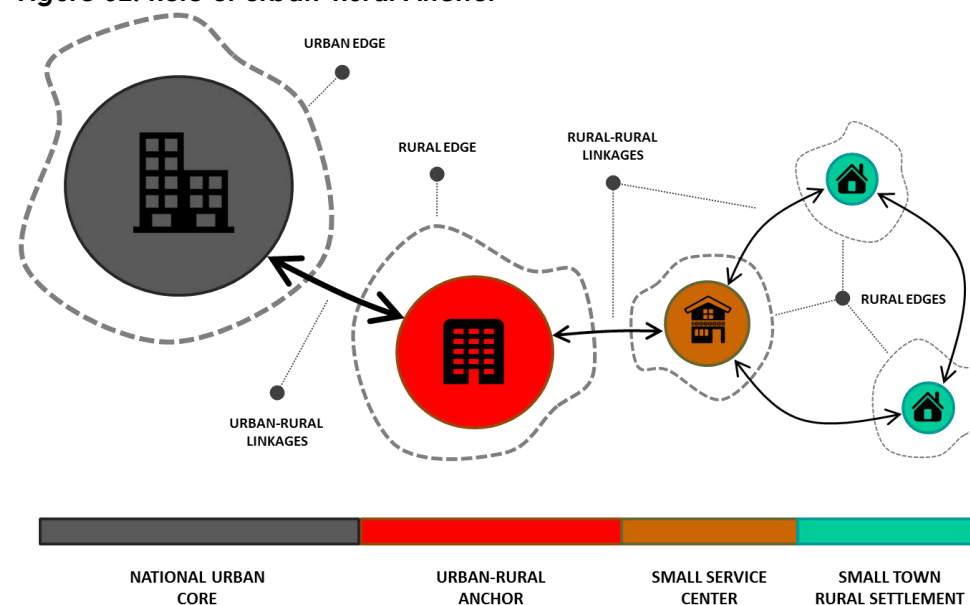


Figure 33: Frame 2 – Critical Roles and Strategic Focus Areas: Productive Rural Regions and Regional Development Anchors as Foundation of National Transformation

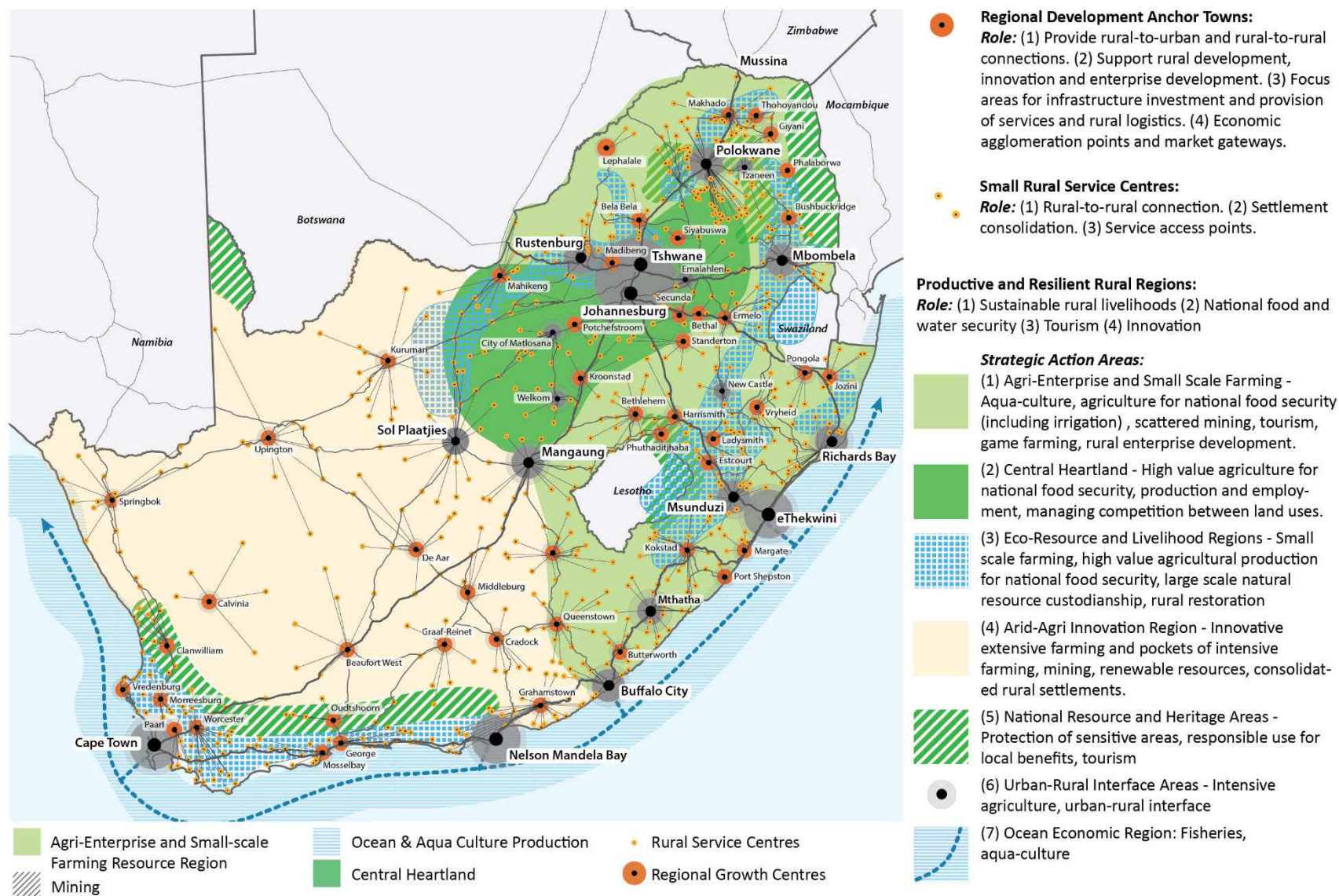
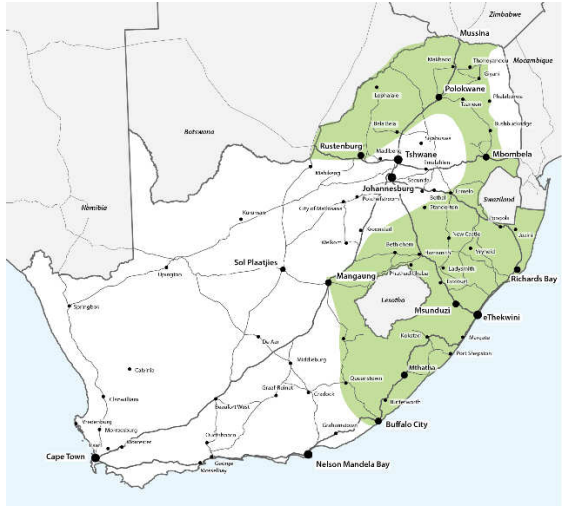
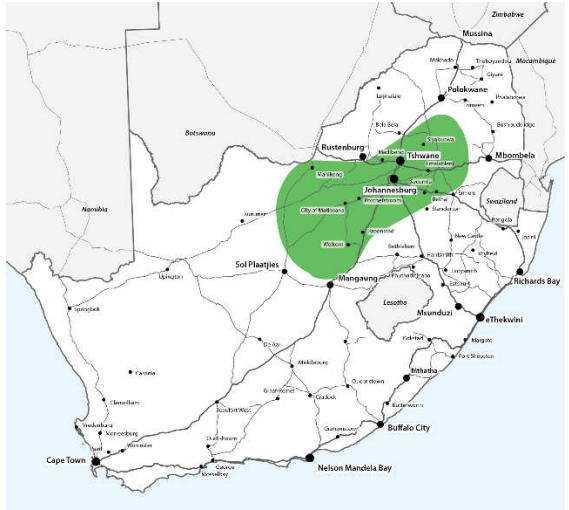
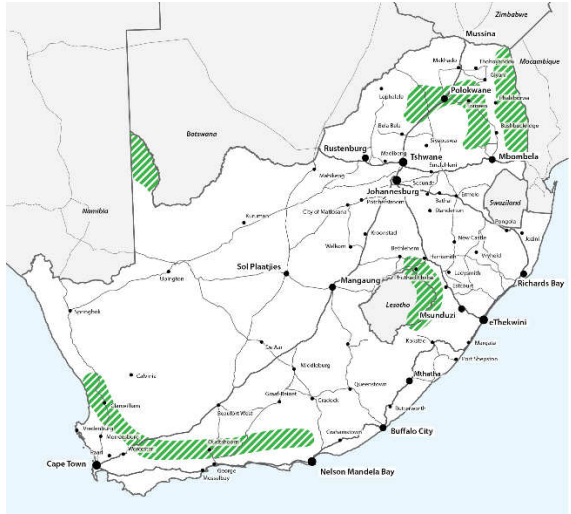
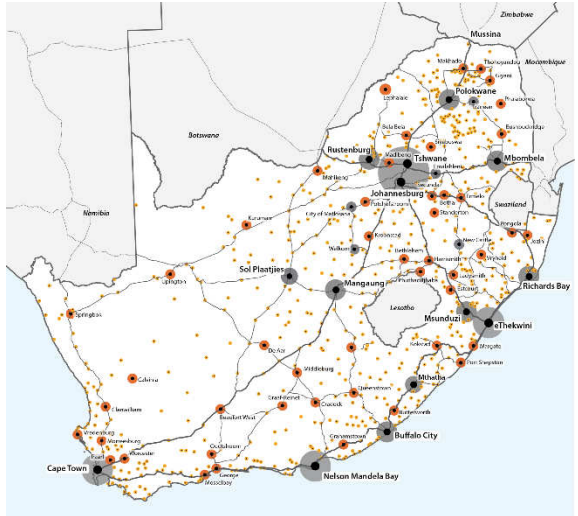


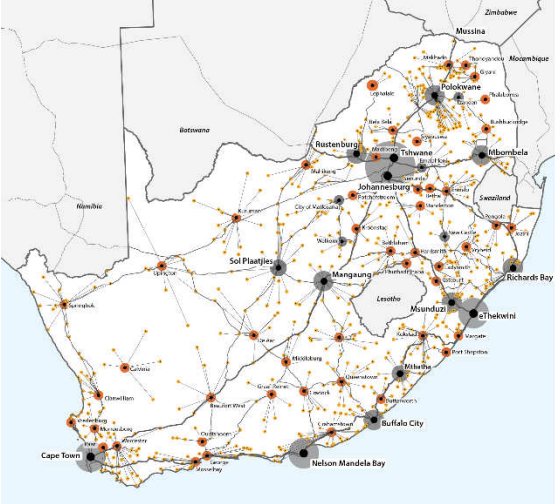
Table 4: Frame 2- Spatial Guidance and Priority Focus Areas: Productive Rural Regions and Regional Development Anchors as Foundation of National Transformation


PRODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS AS FOUNDATION OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.1 Agri and Resource Enterprise Resource Regions</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Identify, protect and manage development of land with high agricultural production potential, and small-scale agriculture and resource enterprise development potential.</p>	<ul style="list-style-type: none"> Intense rehabilitation and management practice to limit and restore degraded land will be required. Productive farming practices will be supported – intensive small-scale farming and large-scale high-value agriculture can support mass production to ensure national food security. Protected Agriculture Land: Within these areas agricultural zoning will take priority. Areas identified in the NSDF (in close collaboration with DAFF) as ‘high-value national agricultural land’ could be augmented with areas as proposed by DAFF as and when the information becomes available. A focus on small-scale farming focus and innovative enterprise development can act as driver for inclusive economic development. Access to land has to be increased through ownership and tenure reform. Collaboration to enable effective land-use management will be required, especially in municipalities with significant high-value agricultural land under pressure of settlement, urbanisation or other land-uses. Alternative ownership models must be pursued and implemented, land administration improved, land capability restoration be done and small-holder farming supported in specific contexts including traditional authority areas to support agricultural production and agrarian reform. 	<ul style="list-style-type: none"> Protected Agriculture Land: Within these areas agricultural zoning will take priority. Areas identified in the NSDF (in close collaboration with DAFF) as ‘high-value national agricultural land’ could be augmented with areas as proposed by DAFF as and when the information becomes available. The Eastern Coastal regions of the country will need to play an increasingly important role in food security and agricultural enterprise development in the future.

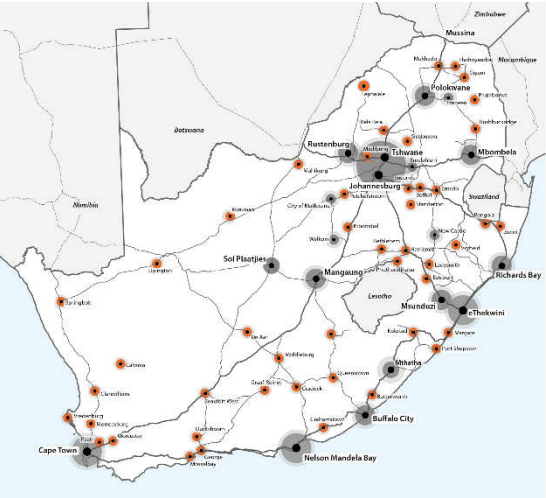
PRODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS AS FOUNDATION OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.2 Central production heartland</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Protect and manage productive use of high value agricultural land, land development competition and economic transition in the central heartland and Greater Gauteng City Region area, in support of national food security and economic contributions.</p>	<ul style="list-style-type: none"> Protected Agriculture Land: Within these areas agricultural zoning will take priority. Areas identified in the NSDF (in close collaboration with DAFF) as ‘high-value national agricultural land’ could be augmented with areas as proposed by DAFF as and when the information becomes available. Within major urban regions, the protection of high-value agricultural land through rural development edges will be encouraged. Intensive rehabilitation and strict control to limit degraded land will be required. Productive farming practices will be supported – intensive small-scale farming and large-scale high-value agriculture can support mass production to ensure national food security. A focus on small-scale farming focus and innovative enterprise development can act as driver for inclusive economic development. Access to land can be increased through ownership and tenure reform. Collaboration to enable effective land-use management will be required, especially in municipalities with significant parcels of high-value agricultural land under pressure from human settlement, urbanisation and other land-uses. 	<ul style="list-style-type: none"> Central heartland around broader Gauteng city region, Free State and Mpumalanga areas. High value agriculture, national bread basket areas and core mining regions, focussed on production and employment, protection of high-value agricultural land and the management of land development competition.


PRODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS AS FOUNDATION OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.3 Eco-resource and livelihood regions –</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Productive agricultural regions that play a critical role in <i>national strategic water production, national food security and rural livelihoods</i>.</p> <p>Enhance productive capacity, environmental and livelihood quality, cultural heritage and resource access through effective agrarian practices and enterprises coupled with large scale natural resource restoration and custodianship.</p>	<ul style="list-style-type: none"> Productive farming practices will be supported – intensive small-scale farming and large-scale high-value agriculture can support mass production to ensure national food security. Regional and place-based planning within relevant municipal contexts will need to be utilised by all the role-players responsible for place-specific as well as generic spatial governance and policy making. Settlement development in consolidated settlements, towns and cities is required to ensure natural resource restoration, productive rural development and high-quality rural livelihood options. Protected Agriculture Land: Within these areas agricultural zoning will take priority. Areas identified in the NSDF (in close collaboration with DAFF) as ‘high-value national agricultural land’ could be augmented with areas as proposed by DAFF as and when the information becomes available. Intense rehabilitation and strict control to limit and rehabilitate degraded land will be required. Collaboration to enable effective land-use management will be required, especially in municipalities with significant high-value agricultural land and strategic water source areas under pressure of settlement, urbanisation or other land-uses. Active promotion of large scale natural resource custodianship and related enterprise development and job creation opportunities. Agrarian reform should focus on transformation of ownership and access, and land-use management. 	<ul style="list-style-type: none"> Eastern Cape, Mpumalanga and Limpopo in-land transition regions.

RODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.4 Network of rural urban anchors</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Prioritise and strengthen strategically located rural-urban anchor towns to support regional development based on agriculture, mining production and regional tourism.</p>	<ul style="list-style-type: none"> Regionally well-located on the transport and infrastructure network providing accessible and well-connected places that act as settlement anchors for a growing national population and national economy. These places act as markets and infrastructure conduits/gateways for agricultural and other geo-specific resource development. The anchors are well-linked (upward) to the Urban Core Regions as well as to a range of smaller towns and rural areas within their hinterlands. Higher-order social service and economic infrastructure investment must be consolidated and concentrated in these settlements. Strong linkages must be provided in rural regions to support enhanced rural livelihoods and well-being. Support regional interdependencies through support for rural logistics and market access infrastructure and enterprise support. 	<ul style="list-style-type: none"> Prioritise provincial specific regional service towns and cities, with consideration of regional and national roles: Network of strategically located priority towns with growing population in town and service region, and economical consolidation potential).

RODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.5 Rural-rural connections</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Invest in rural-to-rural public transport and other transport and communication linkages with rural anchors to enable access to higher order services & economic functions. Enhance linkages to rural hinterlands.</p>	<ul style="list-style-type: none"> It is important to ensure that feeder roads to and from communities are in good condition to access local service towns. Such roads should also be climate-resilient. Establish ICT hubs in service towns and gradually expand these into surrounding dense communities. Rural access roads: Maintenance is critical, as is upgrading of connections between and to rural settlements. 	<ul style="list-style-type: none"> The Eastern Coastal Region and Eastern escarpment, especially former Bantustan areas.

PRODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS AS FOUNDATION OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.6 Arid-agri and innovation region (Nama Karoo Region)</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Largely extensive agriculture with pockets of intensive irrigation farming, clusters of mining, renewable resources and consolidated settlements in a highly arid region.</p>	<ul style="list-style-type: none"> • Limit development of new settlements in and around towns in this water scarce region must be undertaken. • Irrigation innovation areas must be developed in the arid west and increasingly arid central areas of the country around irrigation schemes, dams and canals. • Experimental land development practices must be supported in arid and semi-arid areas of the country, with the use of water from water-intense areas. • Research and innovation must be undertaken in support of specific regional development. • High production and irrigation and innovation clusters must be encouraged around existing (and new) water schemes, to support production and local livelihoods. 	<ul style="list-style-type: none"> • Broader Nama Karoo Region. • Mostly scattered and location-specific around existing water schemes in Agro-Enterprise areas.

PRODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS AS FOUNDATION OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.7 Urban – rural interface regions</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Smallholder farming close to markets will be actively encouraged as part of agrarian reform strategy.</p> <p>Small holder farming should be close to markets, have good access to water, and be well-connected to regional agriculture production infrastructure and topography.</p>	<ul style="list-style-type: none"> • Small Holder Farming Focus Areas and Enterprise Development: Close to markets, urban cores, regional growth centres, and located on transport networks, within high value commercial and traditional authority areas are encouraged. • Intense rehabilitation of degraded land and strict controls to limit recurrences are required. • Demarcation of rural edges, especially within city region areas. • Land reform and urban land reform is crucial. • Rural-to-rural connections and market accessibility and access to centres of innovation in well-connected regional anchor towns and necessary agricultural production infrastructure is required. • Agrarian reform should focus on transformation of ownership, access to land, and land-use management. 	<ul style="list-style-type: none"> • Rural edges around city-regions and urban clusters - intensive agriculture and agri-processing close to markets.

PRODUCTIVE RURAL REGIONS AND REGIONAL DEVELOPMENT ANCHORS AS FOUNDATION OF NATIONAL TRANSFORMATION	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>2.8 Oceans economy focus areas</p>  <p>See Annexure: Frame 2 for legibility and spatial description</p>	<p>Oceans and aqua culture production areas needs to be actively supported as protected national resource.</p> <p>Oceans economy areas, existing initiatives related to aquaculture: scattered and location-specific.</p>	<ul style="list-style-type: none"> Regional and place-based planning within relevant municipal contexts will need to be utilised to by the range of role players responsible for place-specific as well as generic governance and policy making. Coastal surveillance and protection of marine resources needs to be prioritised. Establishment of high value enterprises related to local practice is consideration. ‘Small Medium Scale – Low Labour’ production areas needs to be linked to ocean economy with high value chains. 	<ul style="list-style-type: none"> Priority Ocean’s Economy Aqua Regions.

6.4.3 Frame 2: Priority interventions required to mitigate risks and kick start action

In summary, the **interventions** and land development management guidelines to fast-track the creation of resilient and productive rural regions and livelihoods (i.e. the focus of Frame 2) can be described as:

- Protection of High Value National Food baskets: *Do better;*
- Agri-Enterprise Regions: *Do better and do new things;*
- Agri-Innovation, Urban-rural interface, Ocean's Economy and Resource Protection regions: *Do more of and do new things.*
- Network of Rural-Urban Anchors: *Do new things;* and
- Rural-rural connections and supportive infrastructure: *Do better and do more of and do new things.*

The immediate **high-priority actions** are:

- The conclusion of the DAFF process entailing the **identification, protection and effective use of high value agriculture land.**
- Agri-Enterprise Regions: **Regional scale and location specific agrarian reform strategies** to be developed, with context specific land-reform and collaboration of existing role players to explore enterprise development opportunities. Rural-to-rural connections, market accessibility and access to centres of innovation in well-connected regional anchor towns and relevant agricultural production infrastructure, requires maintenance and improvement of existing infrastructure (especially roads). This requires extension, especially in the eastern coast and eastern escarpment growth regions. Sprawling settlements within these areas have to be actively discouraged.

- **Urban-rural Interface Regions (Rural Edges):** Smallholder farming must be located close to markets on high-value agricultural land. Within major urban regions, the protection of such high-value agricultural land from urban intrusion can be done by the introduction of 'rural edges'. Suitable land for small-scale farming must be identified in provincial and municipal SDF preparation and review processes.
- **Identify and strengthen strategically located rural-urban anchor towns** through consolidated settlement and rural economic development interventions:
 - The role of specific settlements as gateways and interchanges on the regional public transportation network must be clearly identified and incorporated into the planning of functional rural regions. The connectivity of tribal areas and rural settlements with surrounding higher-order urban settlement and economic systems must be enhanced.
 - More productive agriculture, beneficiation and economic diversification of high-functioning rural regions around rural anchors must be enhanced by the provision of supportive infrastructure.
 - Nodes that will serve as rural development and service provision anchors must be supported. A specific focus must be placed on areas of population concentration that lack well-functioning, compact settlements that can serve as rural service centres to access social services. Officials working in these anchor towns need to be encouraged to stay in these towns and contribute to the local economy, instead of commuting to larger towns or cities on a daily or weekly basis. In order to make this

option more attractive, the elements of well-functioning settlements that 'are missing', e.g. urban structure and density-thresholds and a lack of basic and high-quality social services, need to be attended to over the medium-term.

- As proposed in the NDP, special attention must be given to densification along transport corridors in former homelands.

- **Rural-to-rural connectivity needs to be improved**, especially within the Eastern Growth Corridor and Eastern Escarpment dense settlement regions.

- Investments in high-speed ICT infrastructure, and cellular and data coverage must be prioritised in rural areas as catalysts for regional and local economic development, education, innovation and trade/exchange.
- Rural road maintenance and upgrading is critical given the importance of access and the life-threatening impacts of extreme rainfall events and storms.
- Public transport options and availability must be improved.

- **Limited expansion and development of new settlements in arid areas.**

- This relates especially to the drier western parts of the country, but is also applicable to low-density remote rural areas. In existing settlements, residents should be encouraged and supported to become self-sufficient and 'go off-grid'. This includes off-grid water, electricity and sanitation services, as well as food production. Good ICT linkages can be used to support distance-learning and provide access to other social services. Temporary

settlement formation for mining or large-scale projects need to be discouraged and housing provision focussed in existing local towns with viable futures.

- **Consolidate settlement development in agriculture production regions and support quality settlement development in traditional authority areas will require local and regional spatial restructuring.**

- Identify and support municipalities and tribal authorities to prioritise nodes that will serve as rural development and service provision anchors. Settlements with large populations and/or that serve equally large populations in their hinterlands which are densifying, and that have economic growth potentials, should be developed as strong rural anchors for surrounding settlement systems. These areas play a key role, not only for the surrounding rural population, but also act as attractors for urban-rural migration and domestic tourism.
- Strong rural anchors should be the focal points of institutional development, improved land tenure systems, bulk infrastructure provision, and regional and local economic development. They should also serve as 'anchors' of a new rural paradigm, where innovations in tribal land administration, land tenure systems and rural housing models can be piloted. Where possible, public sector investments in housing, infrastructure services and special projects should serve to improve the spatial integrity of tribal areas and rural settlements by focussing on strategic infill locations and integration within the existing village fabric.

- Collaborative spatial development planning and land use management need to be pro-actively brokered in tribal areas, with consideration of the spatial constructs, lexicon, phenomena and/or special land uses that form part of traditional practices in particular places.
- Regional-scale settlement consolidation, effective small-scale farming management and enterprise opportunities related to environmental management and restoration in Strategic Water Source Areas, and areas that harbour high-value agriculture potential must be supported.

Spatial accountability for strategic rural-urban anchor development and consolidation of national settlement patterns, with contextual specific considerations for arid, high value agriculture and/or growth regions will (1) require collaboration between multiple role-players and (2) be guided by clearly defined 'regional spatial outcomes'. Careful consideration of impact, as well as active support of the spatial patterns guiding rural development, agrarian reform and settlement development will be required from national sector departments and agencies. Significant regional collaboration between provincial role players, tribal leaders and municipalities will also be necessary within the context of rural regional spatial planning and the phasing and impact of coordinated transformation initiatives.

- Growth regions for urbanisation will need support from initiatives such as the IUDF and the DHS Master Plan, specifically with regard to the financial viability of settlements, and also regional scale collaboration with a strong focus on (1) private sector, (2) civil society city government involvement within the context of implementation guidance provided in the NSDF.

- Collaboration between long-term infrastructure planning and implementation in support of sustainable national development, as well as phasing thereof will be critical. Coordinated phasing and re-evaluation of corridor development routes to support the flow of people and goods and not just mining-related resources between IPAP, NATMAP 2050, and the NSDF, will be critical.
- Corporate social investment from mining companies, independent power producers, etc. needs to contribute to consolidation and not proliferation of rural settlement patterns.

With regards to **spatial accountability** for agriculture land protection, relevant municipalities will have to account for agriculture land use and management.

Capacity and resource implications will need to be supported at regional scale by the national departments responsible for agriculture and spatial planning, by means of **targeted support and monitoring**. The intention is to ensure that development in these areas, as proposed and managed by Provincial and Municipal SDFs, actively contributes to national food security, productive livelihoods and rural transformation in the country as a whole.

Capacity and resource implications will need to be assessed and attended to at regional scale by the national departments responsible for municipal, integrated spatial, human settlement, rural development planning, with support and monitoring to ensure that development in these areas, as proposed and managed by Provincial and Municipal SDFs. Such support must actively contribute to the ability of these areas to be radically transformed, and for rural regions and rural-urban anchors and rural hinterlands to be resilient and enabler and providers of quality rural livelihoods and thriving economies.

6.5 Frame 3: National Ecological Infrastructure System as enabling infrastructure for a shared and sustainable resource foundation

6.5.1 Developmental significance

It is a national imperative to ensure sustainable and just access to water and natural resources for current and future generations. The NSDF Vision recognises the foundational value of South Africa's shared natural resources and national ecological infrastructure.

High levels of inter-regional and regional interdependencies, pressures on the strategic ecological infrastructure, and more specifically the strategic surface and ground water production areas, clearly highlight the significance of critical natural resource and water production areas in the national spatial landscape.

The national significance of these areas on which 51% of urban population and 64% of the economy is estimated to depend by 2050, is highlighted by:

- Increased demand (growth scenarios based on CSIR Population Projections predict a national population of between 75 and 80-million people by 2050); and
- A projected rise in temperatures, coupled with significant rainfall reductions – downscaled Climate Change Projections (CGCMs) by the CSIR on an 8km resolution, projects the 'mega-dam region climate system' to drift into a temperature regime never observed in recorded history with temperature increases of 4-7 degrees Celsius plausible by 2081-2100, as well as temperature increases and **much drier conditions** in the arid west).

As indicated in the diagnostic section (**Part Three**), the Southern African region is likely to become generally drier, with an increase in temperature and extreme rainfall events, which are likely to have significant impacts on agriculture, energy demand and water security.

Restoration and management of national fresh water bodies and strategic water source production areas is of critical importance for (1) water availability, (2) national well-being, (3) food security, and (4) sustainable economic development. These areas form part of eco-system service areas that:

- Support long-term ecological functioning at the landscape level (which in turn supports climate change adaptation); and
- In some cases, constitute ecological infrastructure that provides valuable ecological services directly to people.

The well-being and future of South Africa's citizens and economy, as well as its water, food and energy security, requires collaborative action within the national ecological infrastructure system. In this regard, the following areas are of national significance:

- **National Protected Areas:** The category include formal protected areas as pristine natural resource areas with a focus not only on their role, e.g. as national and provincial parks, but also on their role in the bigger system of bio-diversity and ecological infrastructure that require protection. International trans-frontier parks, marine protected areas and nationally significant fresh water bodies are also included; and
- **Strategic Water Resource Management Areas:** Regions where both the responsibility of conservation and restoration of the natural resource foundation and the benefits of sustainable water availability

and ecosystem services are shared by an increasing number of people, cities and economies in (1) the immediate area, and (2) other regions that are reliant on this area for these services.

International and National Resource Conservation and Regional Landscape Scale Natural Areas such as Mountain Ranges are also areas of national and international significance in which the natural resource foundation and bio-diversity endowment need to be conserved, and which are regarded as strategic assets within the national ecological infrastructure and tourism systems.

Also important are the **Critical Biodiversity Areas (CBAs)**. Category 1 CBAs (SANBI, 2014) are irreplaceable, which means there are no other places in the landscape where the conservation and ecological objectives associated with those CBAs can be met. Protected areas and CBAs jointly ensure that a viable representative sample of all ecosystems and species persist, and together constitute roughly 30% of the national landscape.

The spatial logic for investment in ecological infrastructure (**Figure 34**) provides significant opportunities and has to be utilised to (1) create new enterprise and green economic opportunities and associated employment opportunities, (2) alleviate poverty, and (3) reduce inequality.

6.5.2 Strategic National Spatial Development Guidance

Spatial development guidance with regards to areas of national and international significance (1) in which the natural resource foundation and bio-diversity needs to be conserved, and (2) which are regarded as strategic assets within the national ecological infrastructure, are set out in **Figure 34**.

This frame raises awareness of the significance of regions to realise (1) the national development objectives as outlined in the NDP, and (2) the National Spatial Development Vision. The guideline table (**Table 5**) provides spatial guidance and priority focus areas to all role players within the national space with regards to: “what should be done”, “what we should stop doing” and “what we should continue doing, but do more of, or do better, or do less of”, to ensure sustainable use, just access and developmental benefit related to protection, management and development of South Africa's natural resource foundation and ecological infrastructure.

Figure 34: Frame 3- National Spatial Significance and Frame Logic: Natural Resource Foundation and Ecological Infrastructure

National Spatial Significance and Frame Logic: Natural Resource Foundation and Ecological Infrastructure

Ecological infrastructure refers to naturally functioning ecosystems that generate or deliver valuable services to people, such as fresh water, climate regulation, soil formation and disaster risk reduction. **It is the nature-based equivalent of built or hard infrastructure, and is just as important for providing services and underpinning socio-economic development.** The Framework for Investment in Ecological Infrastructure (SANBI, 2014) highlights key messages:

- **Ecological infrastructure supports South Africa's economy by providing essential services and reducing risk.** Some ecological infrastructure is degraded, and needs to be restored. Investing in ecological infrastructure involves devoting time, effort, finances and making decisions that support the maintenance of functioning ecological infrastructure, and the restoration of degraded ecological infrastructure. Investing in ecological infrastructure supports South Africa's development objectives of poverty alleviation, rural development and job creation.
- **Investment in ecological infrastructure should go hand in hand with investment in other forms of infrastructure, with multiple benefits to society.** Water availability and protection of strategic water source areas are of national significance for local residents/economies and dependent regions, people and economies. Ecological infrastructure is often located outside major urban centres, and investment in maintaining and restoring these assets has the potential to create employment and contribute to poverty alleviation in rural areas. Investment in ecological infrastructure is often labour intensive, and ecological infrastructure is often located in rural areas.
- **Investment in ecological infrastructure can help to create employment and alleviate poverty.** Investing in ecological infrastructure is a low-cost high-return development strategy with multiple social, economic and environmental gains.

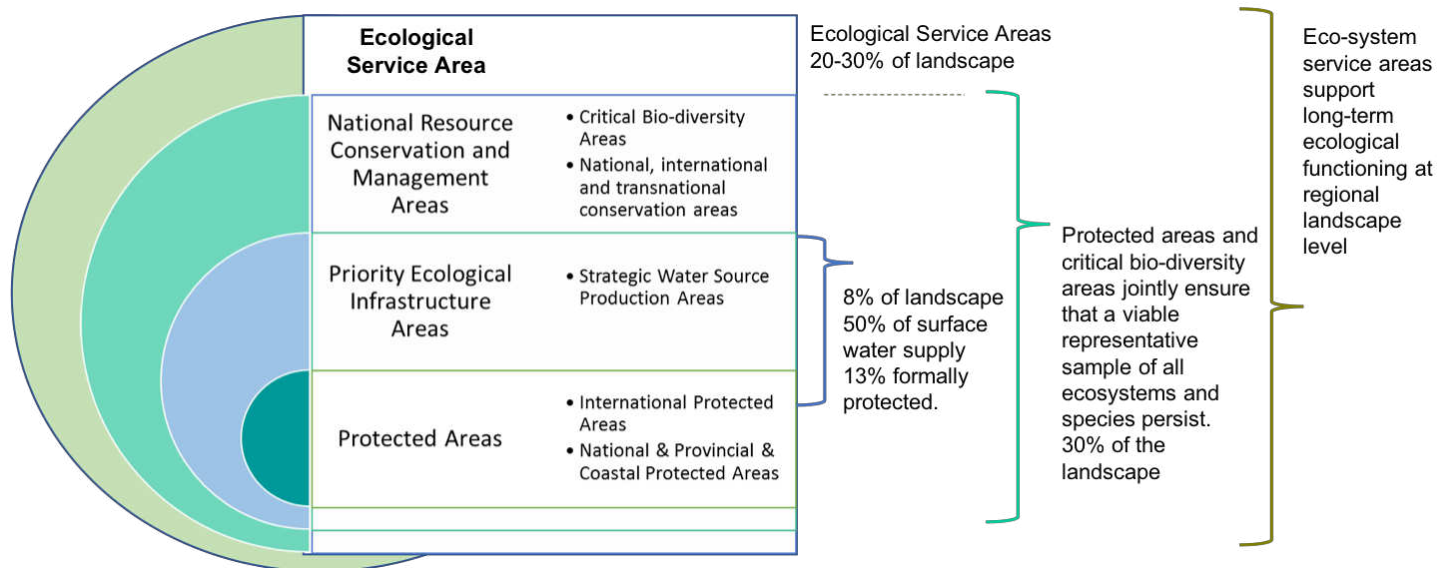


Figure 35: Frame 3- Critical Role and Strategic Focus Areas-National Ecological Infrastructure System as Enabling Infrastructure for a Shared and Sustainable Resource Foundation

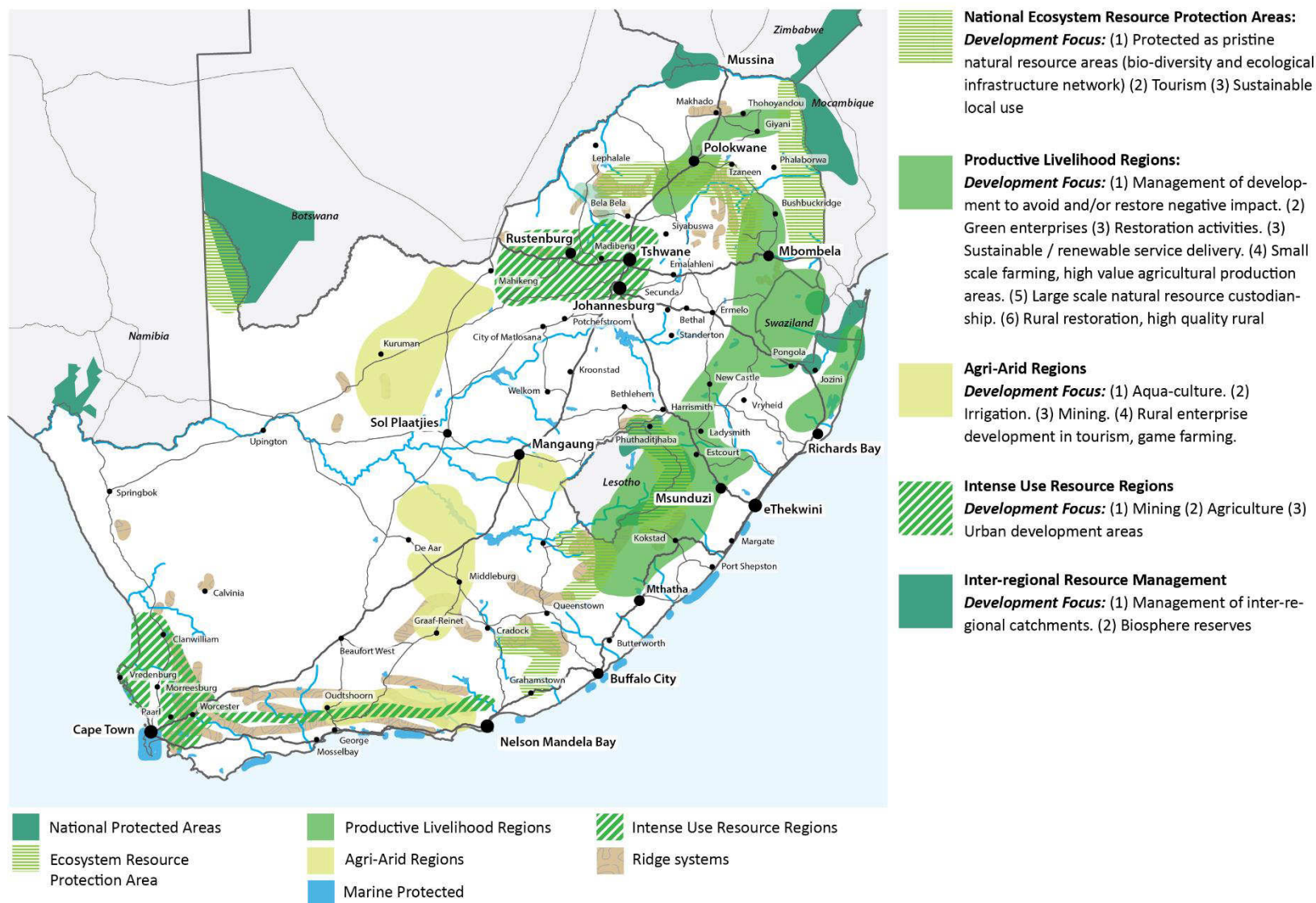
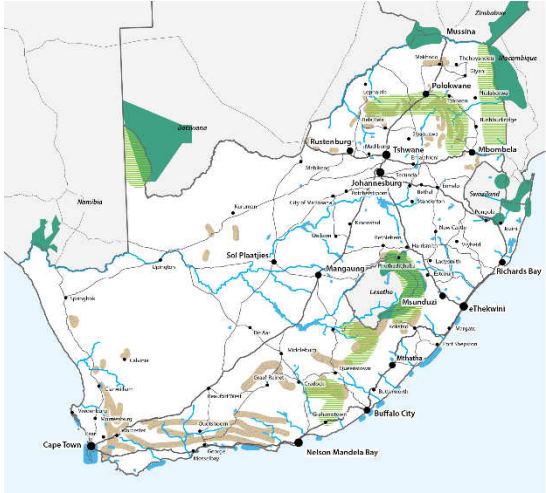
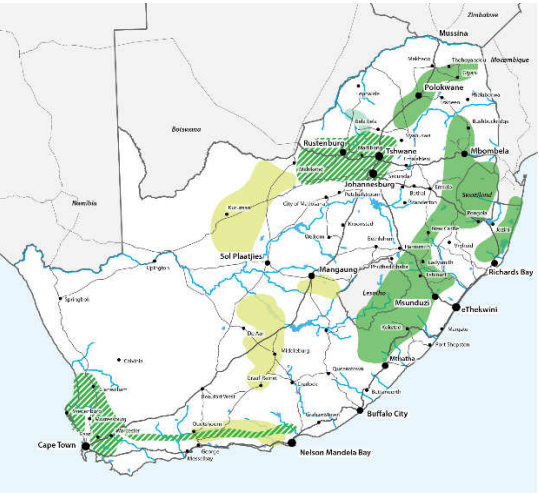


Table 5: Frame 3- Spatial Guidance and Priority Focus Areas -Natural Resource Foundation and Ecological Infrastructure Frame Guidelines

RESILIENT REGIONAL DEVELOPMENT ANCHORS AND RURAL HINTERLAND LIVELIHOODS	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>3.1 National Ecosystem Resource Protection Areas</p>  <p>See Annexure: Frame 3 for legibility and spatial description</p>	<p>Areas to be protected as pristine natural resource areas.</p> <p>Range of official international, national and provincial, marine and fresh body protected and Transfrontier Parks and mountain ranges</p>	<ul style="list-style-type: none"> Protection and management of the range of officially protected national and provincial parks, as well as protected ocean areas. Declaring new protected areas, e.g. parts of the Strategic Water Source Areas could be considered as Nature Reserves or Protected Environments through the Protected Areas Act (Act 57 of 2003). Areas regarded as strategic assets within the national ecological infrastructure and i.e. tourism systems (including Critical Biodiversity Areas (CBAs), Ramsar Sites and Transfrontier parks). CBAs should remain in natural or near-natural ecological condition, i.e. no intensive land uses should take place in these areas. Critical Biodiversity Areas (CBAs), Ramsar Sites and Transfrontier parks are regarded as strategic assets. Effective use of national protected and nature areas must be ensured, to support rural livelihoods, especially related to custodianship and tourism opportunities. 	<p>Declaring new protected areas, e.g. parts of the Strategic Water Source Areas could be considered as Nature Reserves or Protected Environments through the Protected Areas Act (Act 57 of 2003).</p>

RESILIENT REGIONAL DEVELOPMENT ANCHORS AND RURAL HINTERLAND LIVELIHOODS	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>Strategic Water Resource Management Regions</p> <p>Strategic Water Source Production Areas (Strategic Ground Water and Surface Water Production Areas)</p>  <p>See Annexure: Frame 3 for legibility and spatial description</p>	<ul style="list-style-type: none"> Development has to be well managed to avoid any negative impact, and restoration prioritised. Productive use and management of strategic water source areas to support national and local livelihoods and economies: <ul style="list-style-type: none"> Productive Livelihood Regions (Densely settled small holder farming and livelihood regions); Agri-Arid Regions (Groundwater production regions); and Intense Resource Regions, with dense clusters of urban, agriculture, industrial and mining development. 	<ul style="list-style-type: none"> Strategic Water Source areas have been identified as Priority National Ecological Infrastructure Regions that are of national importance and development. Protection and restoration must be a joint responsibility and also be used for the socio-economic benefit of the people, cities and economies in the local area and other regions that rely on it. Land-uses that reduce stream flow or affect water quality (e.g. mining, plantations, overgrazing) should be avoided in SWSAs, wetlands should be kept in good condition or rehabilitated, and invasive alien plants should be cleared. The natural resource foundation and bio-diversity must be conserved in these areas of national and international significance. New developments and related enterprise opportunities must adhere to national development and management guidelines that have been (and are being) developed for: <ul style="list-style-type: none"> Strategic water source areas; and National Fresh Water Protection Areas. Formal protection of SWSAs should be strengthened, for example through declaring parts of these areas 'Nature Reserves or Protected Environments' (Protected Areas Act (Act 57 of 2003)). 	<p>Productive Livelihood Regions: These are specifically in the Eastern Cape Lesotho Border areas, and the North Coast water source area around Swaziland. Development has to be well managed to avoid any negative impact, and restoration prioritised. Green enterprises, restoration and sustainable/renewable service delivery must be prioritised. Small-scale farming is important, as is the wise use of high-value agricultural production land in these areas.</p> <p>Agri-Arid Regions: Aqua and Irrigation should be done where possible. In mining areas there should be a focus on rural enterprise development, tourism and game farming.</p> <p>Intense Resource Regions: Densely developed Mining, Agriculture & Urban development areas: the Gauteng/Bojanala area, and the Western Cape.</p> <p>Long-term intergovernmental action commitments and spatial outcomes for are required for high-risk water and land development competition catchments, i.e. the Nkangala, Olifants, Waterberg, Umgeni, Berg and Breede River Catchments.</p>

6.5.3 Frame 3: Priority interventions required to mitigate risks and kick start action

In **summary**, the required interventions are as follows:

- National Protected Areas: *Keep on protecting and do more of by adding SWS areas to protected areas;*
- Priority National Ecological Infrastructure Areas: *Stop doing and do more of by adding SWS management guidelines, rehabilitation and addressing water conflict areas; and*
- International and National Resource Conservation Areas: *Do more of by adding CBDs as conservation areas and do better in terms of ecology-related enterprise development and rehabilitation.*

The immediate **high-priority actions** are:

- **Strengthening formal protection of SWSAs**, for example through declaring parts of these areas 'Nature Reserves or Protected Environments' through the Protected Areas Act (Act 57 of 2003).
- **Transformation of current high impact competing land development practices in national risk areas.** Priority action is required in areas where land-use and water competition and pollution are (1) causing severe risks to stressed catchments in fulfilling these roles, and (2) placing downstream dependent regions at risk. Areas where mining, agriculture and settlement impact and place competing demands on water resources in particular, are of national significance. Priority areas for intergovernmental action have been identified as the Nkangala, Olifants, Waterberg, Umgeni, Berg and Breede River Catchments. Coordinated intervention in these regions needs to

be spearheaded by the relevant provinces in collaboration with the Institution responsible for NSDF implementation.

- **Management guidelines for Strategic Water Source Production Areas.** Regulatory implementation related to guideline development and awareness-raising will require an intergovernmental team led by DEA and SANBI. Guidelines for the management of development in Strategic Water Source Areas have been prepared. While official processes need to be followed to finalise and promulgate such guidelines, awareness on these guidelines need to be raised, specifically in terms of the relevance for development, which include agriculture practices, land and spatial development, settlement development, investment in infrastructure and land use management in areas with significant development pressure, such as the Eastern Coast Corridor and Eastern Escarpment areas. Awareness also needs to be raised with regards to Category 1 of the critical biodiversity areas and the implications of such areas for land development, land use management.
- With regards to **spatial accountability** for environmental quality in SWS Areas, CBDs Category 1 and National Fresh Water Protection Areas, relevant provinces responsible for the management of the area, as well as provinces responsible for upstream impacts, will have to account for ecosystem quality.
- Capacity and resource-implications will need to be attended to at regional scale through the national departments responsible for environmental and spatial planning through **support and monitoring**. This must also ensure that development in these areas as proposed in, and managed by Provincial and Municipal SDFs actively contributes to the ability of these areas to play their key role as critical ecological infrastructure areas in support of the development of South Africa as a whole.

6.6 Frame 4: National Connectivity and Economic Infrastructure Networks as enabling infrastructure for a shared, sustainable and inclusive economy

6.6.1 Developmental significance

Geo-specific national infrastructure assets refer to a wide range of national network and built-environment infrastructure assets that are essentially location-specific, but enable (1) flows, (2) connectivity, and (3) the shared utilisation of national resources across space. Such infrastructure networks, which include airports, harbours, border posts, logistic hubs and road and rail networks play a key role in ensuring national and international connectivity and economic growth.

South Africa is key member of the Southern Africa regional development community with a substantial impact on the region. The Southern African Development Community (SADC) is a regional economic grouping that was primarily created as a programme to integrate trade in the region. The SADC objectives, however, extend further to include: achieving development, alleviating poverty and to support the disadvantaged through regional integration.

More recently, SADC adopted an industrialisation strategy roadmap as a means for SADC countries to catch up with industrialising and developed countries. This is due to the SADC-region still predominantly being viewed as a producer and exporter of primary commodities and an importer of value-added goods. The industrialisation strategy aims to support the transition from a commodity dependent path to one where countries in the region develop into value-adding, knowledge intensive and industrialised economies. Partly motivating this objective is the need to

be less vulnerable to economic shocks (economically resilient) and regional integration is seen as an essential requirement for higher resiliency. Also required as part of regional integration, is the development of regional value chains and linkages into global value chains. The flow of materials, people and goods within the region will still require that the physical barriers be addressed including those between South Africa and our SADC neighbours. Considering infrastructure three priorities are of particular importance to South Africa namely energy supply, transport and logistics services and shared water resources.

- **Renewable energy** has emerged as a growing energy type that can contribute to the energy pool in the region. Renewable energy projects have however faced challenges related to a lack of (1) policy/regulation, and (2) connecting infrastructure and financing. Through the interconnected electricity networks, South Africa is able to buy electricity from Lesotho, Mozambique and Namibia (when surplus is needed) or sell to Botswana, Lesotho, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe when it has access production (ESKOM, 2016). The SADC Energy Sector plan indicates that, apart from the infrastructure projects in South Africa, there are also a number of planned (or current) projects aimed to increase power generation in the region (Southern African Development Community, 2012) to take cognisance of. Nationally these are also in consideration through the Electricity Grid Infrastructure and Gas Pipeline Extension, for which a national SEA process is currently underway.
- Transport and logistics infrastructure has been identified as key to creating an enabling environment to achieve the goal of sustainable regional socio-economic development and to close the increasing gap in the provision of high quality, efficient infrastructure considering road and rail infrastructure. In response to this, the SADC adopted a spatial development corridor strategy in 2008 (see **Figure 3**). Rail lines

have seen minimal improvement, revitalisation or growth which is considered critical for improved efficiency movement of freight and to protect infrastructure investment in the regional road network. Poor road quality and lack of maintenance budget in certain areas remains a critical concern of both regional and urban roads. Future forecasts indicate that although capacity currently exists on the road network, the 2027 projections suggest the need for further widening, construction of bypasses for major cities, passing lanes in hilly regions and more efficient border posts (Southern African Development Community, 2012). While the SADC railways generally operate well below their original design capacity, yet they cannot increase their volumes because of poor track condition, lack of locomotive and wagon availability and low operating capital. The TRANSNET rail investment plan also indicates a new rail line to Botswana (Lephalale-Mahalapye) for coal transport, as well as the upgrade of several lines to the major harbours to support mineral exports.

- Water availability across SADC varies. The countries with the greatest demand also have the most limited supply. South Africa shares several water catchment basins with neighbouring countries including the Orange-Senqu basin (Namibia, Botswana), Limpopo basin (Botswana, Zimbabwe, Mozambique), Inkomati basin (Swaziland, Mozambique), and the Maputo-Usungu-Pangola Basin (Swaziland, Mozambique). It is projected that by 2025, two of South Africa's major river basins (Orange-Senqu basin and Limpopo) will be under stress i.e. have less than 500 cubic metres of water available per person annually (Earle & Malzbender, 2013), as indicated in **Section 4**. 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, the regional importance for transboundary water management, and sustainable biodiversity and natural ecosystems, including wetlands (which are the basis for rural livelihoods and for tourism) are clearly evident.

Within South Africa, road, rail and economic infrastructure investment also needs to support transformation. However, large segments of such infrastructure have been significantly shaped by the demands of the colonial and Apartheid economic and settlement systems: Large-scale infrastructure investment focused on the extraction and export of commodities and the development of a country for the sole benefit of a white minority. While world-class road infrastructure was provided to connect areas inhabited by white people, homelands and townships at best had gravel and dirt roads. These exploitation-focused networks also meant that the spatially segregated model of Apartheid could be sustained through highly inefficient, wasteful and dangerous daily commuting distances, and often led to the creation of vast sprawling settlements far away from urban cores with very little of the innate benefits of urban living.

Medium-growth population growth scenarios prepared by the CSIR in 2018, estimate that South Africa's population will have crossed the 75-million mark by 2050. In accordance with these scenarios, more than 50-million of those alive at that time will be between 15 and 64 of age. In other words, the bulk of the population will be of working age. Given the estimates of an urban population of more than 80% by 2050, South Africa stands to gain the greatest benefit from both its demographic and urban 'dividends' between now and 2050³ if it is optimally harnessed.

³ Cilliers, J. April 2018. Made in Africa: Manufacturing and the fourth industrial revolution. Institute for Security Studies.

For South Africa to make full use of this 'double-dividend', massive infrastructure investments and changes in the logic of infrastructure investment between and within urban core regions and cities will need to be made. This includes:

- Greater investment in strengthening and maintaining key national and regional roads and rail routes and revitalisation of rail infrastructure specifically
- 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) providing 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 growth points and service towns; and
- More investment in the infrastructure required for (1) renewable energy generation, storage and distribution, (2) smallholder farming and agro-processing, (3) innovation, (4) tourism, culture and entertainment-led economic growth, and (5) knowledge-creation and transfer.

Given the high costs and long life-cycles involved in large scale infrastructure investment, timeous evaluation and design of appropriate geo-specific national economic infrastructure is critical. Transitions in national settlement patterns, major economic activities and sectors, agriculture and agro-processing and water production, as a result of climate change and technological advances (notably in transport, energy generation and communication) need to be planned for well in

advance, and modes and patterns of infrastructure investment adjusted accordingly. This includes (1) major national settlement transitions from the increasingly drier western and interior parts of the country to the 'wetter' eastern and southern coastal areas, and (2) the investments in road, rail and settlement related infrastructure this will require.

6.6.2 *Frame 4: Strategic National Spatial Development Guidance*

Spatial development guidance to ensure national, global and local co-benefits from the developmental impact of geo-specific national economic infrastructure and resource systems, are set out in **Frame Four** (see **Figure 36**). This frame raises awareness, not only of the footprint and its national significance, but also of its regional interdependencies and impact on the geo-specific national economic infrastructure and resource systems.

The national economic infrastructure and resource systems play a crucial role in enabling South Africa to reach the national development objectives, as outlined in the NDP, and to bring about the **National Spatial Development Vision** and **Settlement Pattern** as outlined in this NSDF. Given this strategic role of the national infrastructure and resource assets in place-based and regional economic development, coordinated long-term planning, phasing and resource allocation at national scale is crucial for provincial, district and municipal planning and development management.

The guideline table (**Table 6**) provides spatial guidance and priority focus areas with regards to Frame 4 to identify the contribution of all role-players within the national space with regards to "what should be done", "what we should stop doing" and "what we should continue doing, but do more of, or do better, or do less of".

Figure 36: Frame 4 -Spatial Guidance and Priority Focus areas-National Connectivity and Economic Infrastructure Networks

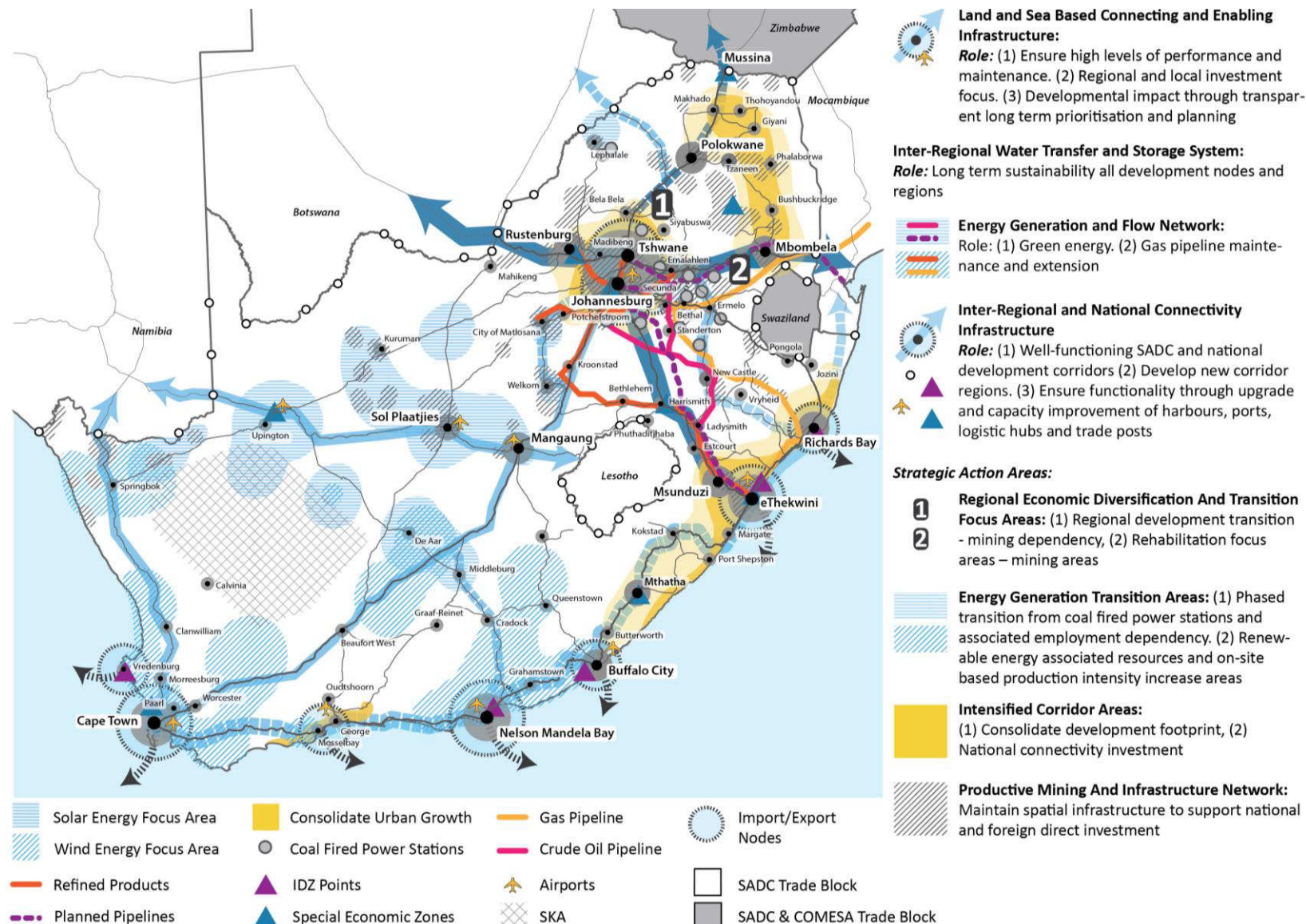
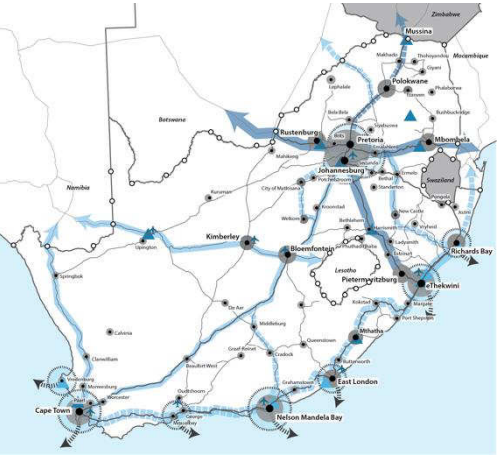
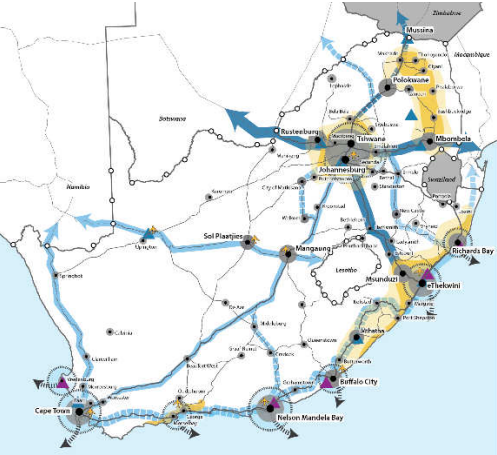

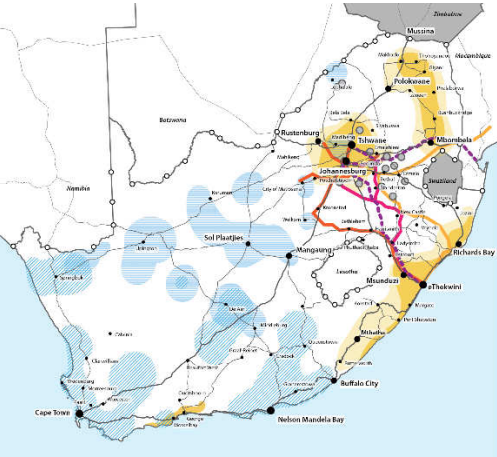


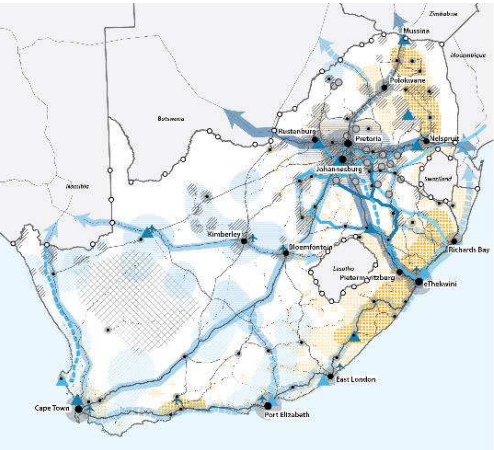
Table 6: Frame 4: Critical National Connectivity Infrastructure Network as Enabling Infrastructure for a Shared, Sustainable and Inclusive Economy

DEVELOPMENTAL IMPACT OF GEO-SPECIFIC NATIONAL ECONOMIC INFRASTRUCTURE AND RESOURCE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>4.1 National and inter-regional land and sea based connecting and enabling infrastructure</p>  <p>See Annexure: Frame 4 for legibility and spatial description</p>	<p>Capitalise on existing and extend strategic inter-regional and national road, rail networks, ports, harbours, logistic hubs</p>	<ul style="list-style-type: none"> • All roads are well surfaced and key national road routes are prioritised for infrastructure maintenance and investment. • Rail infrastructure is rehabilitated and expanded to support SADC and national logistic with respect to freight and passenger rail as appropriate. Key focus on rail freight to limit impact on road infrastructure. • Routes, ports, harbours, trade and border posts, logistic hubs for maintenance and extension are prioritised through collaborative and pro-active long-term planning and phasing. • Logistics hubs, ports (airports and harbours) are maintained and expanded to keep pace with national and regional growth and settlement needs. • Linkages into the region remain operational and can cope with increased utilisation. • Facilities at ports/border posts are important, and should be improved and maintained to reduce delays and costs • Regional and local investment and developmental impact must be enhanced through transparent long-term prioritisation, planning and phasing. • Regional and local investment and developmental impact must be harnessed through clear long-term planning and phasing of extensions, and maintenance of existing. 	<ul style="list-style-type: none"> • The Maputo Corridor (N4) 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) and the Beitbridge border N1 into Zimbabwe (extending from as a secondary route to Botswana (the N11).

DEVELOPMENTAL IMPACT OF GEO-SPECIFIC NATIONAL ECONOMIC INFRASTRUCTURE AND RESOURCE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>4.2 Infrastructure to support water security and flows</p>  <p>See Annexure: Frame 4 for legibility and spatial description</p>	<p>Prioritise maintenance and timeous extension of key national energy and water networks to high levels of performance and efficiency.</p>	<ul style="list-style-type: none"> • The national grid for Electricity Grid Infrastructure and Gas Pipelines must support economic and residential activity to a high level • Regional and local investment and developmental impact must be ensured through clear long-term planning and phasing of extensions, and the maintenance of existing infrastructure. • Our Inter-regional Water Transfer and Storage System is of strategic importance for cities and regions in all provinces, especially so in increasingly drier conditions, and indirectly impacts water availability, maintenance and upgrading. • Dams must be built, expanded or maintained to enhance water storage under conditions of climate change. Water recycling must be practised in all urban cores and regional anchors/growth regions. • Water pipelines must be maintained and extended to key urban cores, anchor towns and geo-specific production sites in line with national priorities and/or trade-offs. Water efficiency is critical action for sustainability, which requires the prioritisation of water recycling, management and augmentation projects. 	

DEVELOPMENTAL IMPACT OF GEO-SPECIFIC NATIONAL ECONOMIC INFRASTRUCTURE AND RESOURCE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>4.3 Productive mining and infrastructure network</p>  <p>See Annexure: Frame 4 for legibility and spatial description</p>	<p>Maintain, expand and manage impact of spatial infrastructure to support sustainable mining economy</p>	<ul style="list-style-type: none"> Mines provide resources, income and employment during the life-time of the mine, but are not centres of permanent settlement formation or employment. Significant regional economic transition and development is required for regional economic diversification and transition in large urban conurbations where mining-related employment is declining or expected to decline. Collaborative, long-term regional development for new exploration areas is required, which includes scenario development, population migration projections, diversification strategies and cost considerations for regional infrastructure, municipal service delivery and cumulative impact and opportunities. Rehabilitation and impact minimising development considerations which limits new settlement development on site must be considered. In future, all mining areas are rehabilitated and returned to their previous or alternative use, as required. The growth of existing towns close to these areas is supported. Settlement formation is supported close to Anchor Town or existing small towns where adequate social services are available. The licencing of new mines should also be based on national development priorities. 	<ul style="list-style-type: none"> Collaborative long-term and regional economic diversification and transition focus areas require shared forecasting, phasing, pro-active and regional scale economic transition planning, scenario development and enterprise development between multiple role players and institutions.

DEVELOPMENTAL IMPACT OF GEO-SPECIFIC NATIONAL ECONOMIC INFRASTRUCTURE AND RESOURCE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>4.4 Infrastructure to support national energy mix, flows and security</p>  <p>See Annexure: Frame 4 for legibility and spatial description</p>	<p>Harness renewable energy production and prioritise regional economic diversification in energy transition focus areas.</p>	<ul style="list-style-type: none"> • 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. Collaborative long term and regional economic diversification and transition focus areas require shared forecasting, phasing, pro-active and regional scale economic transition planning, scenario development and enterprise development between multiple role players and institutions. • Renewable energy associated resource and on-site based production intensity will probably increase with an increased energy mix. The developmental implications need to be considered as that includes energy generation activity that provide limited direct employment benefits. Within national urban core regions enterprise opportunities, large scale innovations in service delivery and disruptive technology need to be actively explored to support urban economies and well-being. Within remote and arid regions in the west, the cumulative impact of growing number of wind farms and solar plants should be considered. The growth of existing towns close to these areas is supported but new and on-site settlement should be limited. • Infrastructure, road, rail, etc. that provide access for raw material especially coal should be maintained to a high standard. Sufficient social services must be provided in the nearest town and regional town growth dynamics considered when doing so. 	<ul style="list-style-type: none"> • The Mpumalanga Coal Mining and Coal Fired Power Plant region for environmental considerations. Collaborative long term and regional economic diversification and transition focus areas require shared forecasting, phasing, pro-active and regional scale economic transition planning, scenario development. • Inter-regional Water Transfer and Storage System of strategic importance for long-term sustainability of all provinces and national urban core regions, and which is central to long term planning.

DEVELOPMENTAL IMPACT OF GEO-SPECIFIC NATIONAL ECONOMIC INFRASTRUCTURE AND RESOURCE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>4.5 Manage impact of large scale national land development changes</p>  <p>See Annexure: Frame 4 for legibility and spatial description</p>	<p>Manage potential negative impacts associated with exclusionary or limited local benefit of large scale national land development changes</p>	<p>Exclusion sites are of different types and have both positive and negative impacts:</p> <ul style="list-style-type: none"> • Internationally or nationally significant and contribute to national prestige. This group of activities includes SKA and SALT, which are sites of international co-operation and scientific innovation, but where development is limited to maintain scientific excellence; • Supports national growth and development through power generation, i.e. Koeberg; • Provides essential sites for storage of toxic or radioactive waste; and • Contributes to National Security i.e. Defence and National Key Points. 	

6.6.3 Frame 4: Priority interventions required to mitigate risks and kick start action

The need for collaborative long-term planning with regards to national and inter-regional land and sea based connecting and enabling infrastructure is clearly evident.

To support the national urban-regions and international gateway role of urban-regions and cities, and development corridors as identified in **Frame 1**, this will include:

- Ongoing support for international and SADC trade and connectivity to support well-functioning and effective harbours, ports and trade connections; and
- Maintenance and extension of strategic national connectivity corridors linked to a network of urban-regions, cities and regional development anchors, with a specific focus on the N2;

In **summary**, priority interventions required to support national development planning, sustainable spatial patterns, transformation from colonial spatial patterns of resource dependencies, and regional transformation of increasing unemployment at scale, can be described as:

- Maintain, expand and manage impact of spatial infrastructure to support sustainable mining economy
- Undertake collaborative long-term planning and innovative interventions to support regional economic diversification and transition in the Core Innovation and Mining Belt as strategic national focus area;
- Collaborative long-term planning in new exploration, renewable energy production and regional development focus areas; and

- Rehabilitation focus areas (scattered).

Major transitions have been identified in the energy generation footprint areas, based on (1) global trends and (2) international and national emission targets and commitments, to contribute to climate change adaptation. These include:

- Coal-fired power stations and associated employment dependency footprint as areas for phased transition; and
- Renewable energy associated resource and on-site based production-increase areas.

A major priority and risk for national water security, well-being, livelihoods and dependent urban systems is the national inter-regional water transfer and storage system. National and regional collaboration in maintenance and sustainable water availability needs to take centre-stage in integrated and aligned long-term planning with a clear indication of regional inter-dependencies.

Place-based implications of locally restrictive land-uses of national significance need to be considered and mitigation measures must actively involve context-specific development innovation opportunities, and not merely national scale impact assessments.

With regards to short-term action requirements, the **most prominent priority actions** have been identified as:

- Collaborative long-term planning and innovative interventions to support regional economic diversification and transition:
 - In the Core Innovation and Mining Belt as strategic national focus area; and
 - The Mpumalanga coal-fired power stations and associated employment dependency footprint areas;

- The development of a collaborative national scale long-term infrastructure planning, prioritisation and phasing system/process including key sector departments and provinces; and
- National and regional collaboration in clarity, prioritisation and resource allocation for maintenance and sustainable water availability needs to be central to integrated and aligned long term planning with a clear indication of regional inter-dependencies and upstream and downstream affected regions.

The introduction of **spatial accountability** to assess national, regional and place-based developmental impact and/or the contribution of geo-specific national economic infrastructure investments. Awareness needs to be raised on interdependencies. A phased approach would require at least transparency with regards to priorities, plans, phasing, as well as unforeseen impacts and associated risks to national and regional livelihoods and economies. A coordinating institution and ongoing process will be a priority. In addition to the SIPS programme's focus on tracking implementation, there is a need to craft collaborative long-term, futures-orientated processes with appropriate modelling and scenario capabilities.

For the specific identified intervention areas, intergovernmental and state-non-state SADC, national and region-based collaboration and implementation collaboration processes need to be established. It is important that transition areas form part of the identified national urban core network.

Capacity and resource implications will need to be considered for ongoing and extensive national collaboration and regional intervention processes.

6.7 Frame 5: National Social Service and Settlement Infrastructure System in support of national well-being

6.7.1 Developmental Significance

Investment in social infrastructure if used positively, and in the correct places can be used as an economic multiplier. Government social investment can be used to enhance urban focus and development through agglomeration of services to support place making and stimulate private investment in identified areas of concentration. Investment must be done timeously to keep track with, and be aligned to future population growth. Mutual alignment of population and settlement growth with transport networks and supporting infrastructure is a necessity. The location of core facilities relies critically on accessible location aligned to areas of key economic activity within settlements – not only where land is readily available or cheapest. This contributes to reaping locational and urban dividends, by using the new infrastructure required by communities (for new growth & backlogs) as an economic multiplier in urban cores and rural service centres. Such service sector investment can improve human well-being through quality provision of education and health services as a minimum.

Critical considerations for the NSDF are (1) an increase in highly productive civil servants who will have a high impact on national well-being and the national economy, (2) an improvement in educational quality and outcomes, (3) an improvement in national health and well-being, (4) an increase in the demand for sector-specific tertiary training facilities and employment, (5) spatially targeted, coordinated and aligned investment of social services in carefully selected cities and rural service towns, and (6)

employment creation through capital investment in urgently-required infrastructure in identified nodal/core areas in settlements.

The positive impact of social infrastructure investment is far-reaching, especially in terms of the contribution to human capital development and well-being. Concentrated government investment of social service facilities can enhance nodal development, support place-making and stimulate private sector investment in such areas. The investment, maintenance and upgrading of such infrastructure also acts as a job creator, in addition to its benefits in improving national well-being.

For highest efficiency and effectiveness, it is important that social services are provided in the context of a '*structured national settlement service provision framework*', where each settlement typology fulfils a specific role. The settlements have different reach distances/service areas, with each service type linked to a specific settlement typology. For example, basic services like schools and libraries are provided in small towns and service centres within short travelling distance to communities. Likewise, the highest order services requiring economies of scale for example universities and regional hospitals are provided in larger towns following the spatial logic indicated in **Figure 37**.

EXAMPLE: Typical estimated implication for Basic Education growth requirement: human resource & capital investment for 2050

	Number of facilities required	Professional Teachers	Construction cost assumption per facility	Cost in R million (2016 cost estimates)
Secondary Schools*	1523	38 075	R 50 million	304 700
Primary Schools with Grade R*	2721	68 025	R 40 million	380 880
Early Childhood Development facilities**	6348	31 740	R 5 million	2 855
ECD Resource Hub***	952	14 280	20 million	19 040
* 25 classrooms per school ** 5 classrooms per ECD *** 15 classrooms per Hub				

Rural regions in South Africa can very broadly be described in two categories, i.e. (1) the more densely developed and settled eastern part of the country, and (2) the more arid, sparsely developed and remote rural hinterland where achieving service delivery efficiencies are more difficult and more critical to achieve. These areas are often associated with (1) disproportionate levels of poverty, (2) high unemployment levels, and (3) poor access to services, when compared to the rest of South Africa. It is essential that to redress such issues, the provision of social services is provided in a manner that is both socially and spatially just, but also sustainable over the long term.

The provision of services in rural and especially tribal authority areas is essential. Effective locational provision against the complex spatial permutations of apartheid geography and diverse population groupings and distribution patterns is challenging but can be achieved through a spatially targeted location in identified urban cores, rural anchors and service towns that are within acceptable service reach of rural areas. Spatially targeting can be applied to efficiently serve the surrounding hinterland and to redress the burdens of poverty and inequality that have remained prevalent in many rural regions.

The provision of quality social and developmental services such as health, education and citizen registration accessible to all is required. For highest efficiency and effectiveness, it is important that social services are provided in the context of a '*structured national settlement service provision framework*', where each settlement typology fulfils a specific role. The settlements have different reach distances/service areas, with each service type linked to a specific settlement typology. For example, basic services like schools and libraries are provided in small towns and service centres within short travelling distance to communities. Likewise, the highest order services requiring economies of scale, for example universities and regional hospital should be located with large towns and cities.

Addressing the many structural deficiencies and inefficiencies characterising rural and tribal areas is a central motivation in the journey towards spatial transformation in South Africa. A consolidated strategy of settlement development and urbanization linked to the efficient and structured distribution of social service in terms of a settlement typology logic can effectively support the achievement of productive rural regions and access of services to those people living in the towns and surrounding rural regions to bring about transformation at scale, in the places that people call home. This should be done in conjunction with **Frame 2** (Productive Rural Regions and Regional Development Anchors) and a concerted effort be made for regional specific developmental interventions to support the creation of 'well-functioning functional rural regions, regional and networks of well-connected settlements'.

In this regard it is important to recognise the importance of a network of consolidated regional and rural nodes and service towns to:

- Provide access to a range of social and economic services;
- Provide access to markets; and
- Ensure rural-rural connectivity via rural-urban anchors.

The **focus** is on:

- Consolidation of settlements and the optimal provision and location of services including through maintenance, increasing the service reach, and ensuring efficiencies of scale, agglomeration and trade;

The cornerstone of the desired rural transformation resides in the development of Urban-Rural Anchors and Small Service Centres that are well provided with services of appropriate range and scale, as indicated by 'the service wheel' in **Figure 38**. This intervention seeks to radically

transform rural well-being though improved access to high-quality social services.

Figure 37: Illustration of Town Service Reach

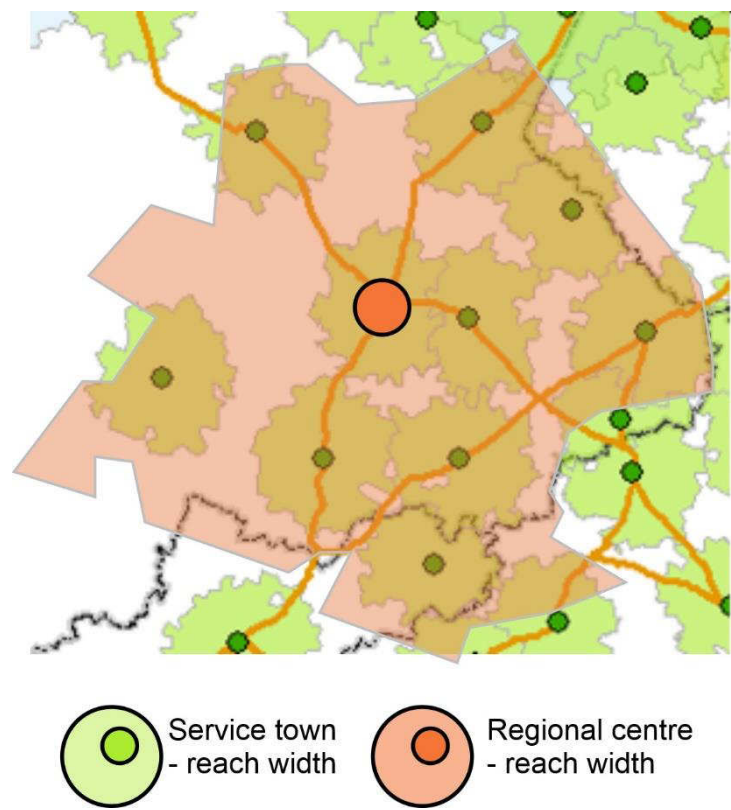


Figure 38: Frame 5: Spatial Logic: Urban service consolidation in Urban Cores, Rural-Urban Anchors and Small Service Centres - To transform rural livelihoods and enable wide reaching access to high quality social services

Urban service consolidation in Rural-Urban Anchors and Small Service Centres - To transform rural livelihoods and enable wide reaching access to high quality social services

Enabling cost-effective access to social services and national service assets to the largest number of people, the most vulnerable groups, through prioritised investment in a network of strategically located national urban cores regions, a prioritised network of large and medium sized towns and a network of small service centres.

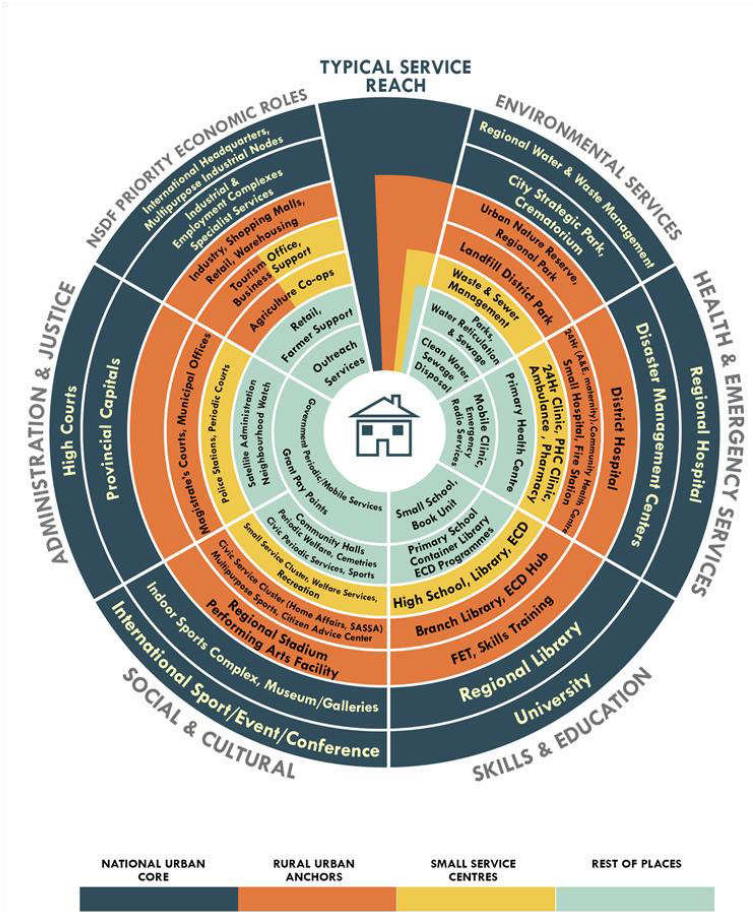
Concentrations of quality urban services in identified rural-urban anchors and network of small service centres will enable good access to more than 90% of South Africa’s population to , as well as strengthen and support nodes of consolidation and economic activity within growing nodes.

Access to basic social services and facilities in other towns and settlements. Limit growth of new settlements in arid west and high value national food baskets.

PRIORITY
NODAL
INTERVENTION
AREAS

- National Urban Cores
- Rural-Urban Anchors
- Small Service Centres

- Small Towns
- Villages, Rural Settlements



The spatial frame logic is that at least one 'Urban-Rural Anchor' is required to act as regional development anchor with the specific purpose of playing an active role in ensuring strong connections to local rural hinterlands through a carefully selected set of prioritised rural service settlements.

The role of the Urban-Rural Anchor is strongly related to (1) creating a consolidated national settlement footprint, and (2) playing an active role in regional context-specific agrarian reform and rural productivity. **Figure 39** provides direction with regards to the location and Critical Role and Strategic Focus of the National Social Service and Settlement Infrastructure System.

Prioritisation of rural service centres is required to facilitate access to medical, education, government, safety and security services which is functionally integrated within **Frame 4 National Social Service Infrastructure Network** as enabler for national well-being.

VALUE SPATIALLY OF TARGETED INVESTMENT

Targeted investment in middle-higher order services in identified regional service towns/points can achieve positive impacts.

Through efficient and effective location of **quality services** in District Hospitals and 24hr Health Centres, Home Affairs, Labour and SASSA offices, FET colleges, Branch Libraries and Sports Complexes it would be possible to to **service 92% of the population** within an acceptable travel distance from only **378 towns** in South Africa..

Specific consideration is required with regards to:

- The consolidation of priority small towns in dense traditional settlement areas, to support productive agrarian reform; and
- Enhancing sustainable service delivery in the dense Eastern Coastal Corridor, as well as in the increasingly arid west where numerous small towns are experiencing town-ward movement, and growing and consolidation of settlements, but increasingly shrinking and vulnerable economies;

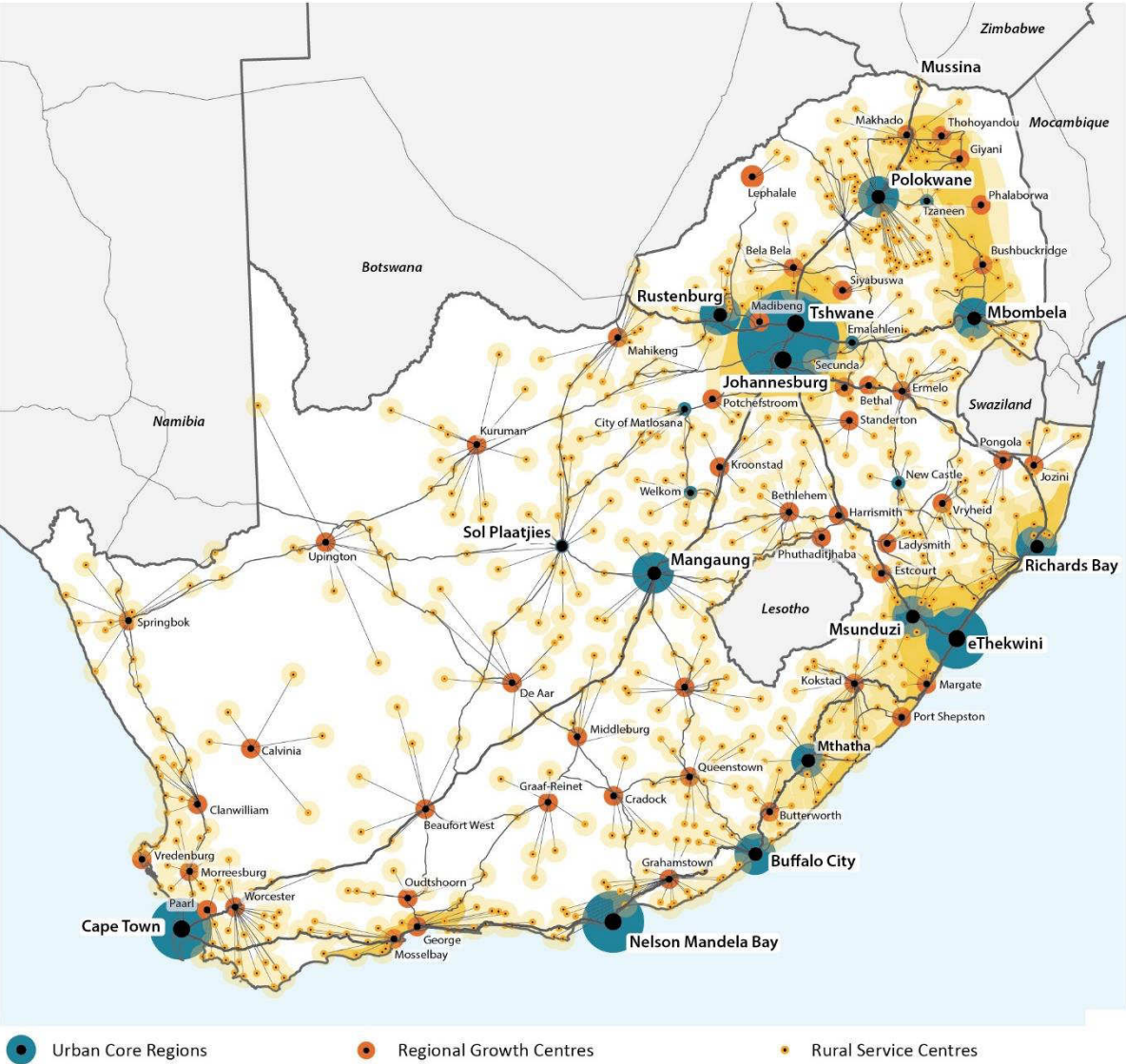
6.7.2 Strategic National Spatial Development Guidance

Spatial development guidance with regards to the critical role of *Resilient Regional Development Anchors and Rural Hinterland Livelihoods* is set out in **Frame Five (National Social Service Infrastructure and Town System** as enabling infrastructure for national well-being).

This spatial development frame raises awareness on the significance of the system of well-connected nodes and networks to (1) reach the national development objectives, as outlined in the NDP, and (2) realise the National Spatial Development Vision and desired National Spatial Development Pattern.

The guideline table (**Table 7**) provides guidance for all role-players in the national space with regards to “what should be done”, “what we should stop doing” and “what we should continue doing, but do more of, or do better, or do less of”.

Figure 39: Frame 5: National Social Service and Settlement Infrastructure System in support of national well-being



Prioritised investment in higher order social services as indicated in Service Wheel and linked to identified Urban Core and Rural-Urban Anchors as identified in Frames 1 and 2.

Enhanced connectivity of productive rural regions:

- Resilient rural-to-rural transport and communication linkages
- Strong connections between regional service centres as rural anchors to enable access to higher order services and economic functions.

Prioritised network of well developed nodes for settlement consolidation and service access location and provision:

- Consolidated settlements, transformative urban land reform and effective land administration in strategic rural resource regions.

Limit growth and consolidate settlements in high risk arid west region.

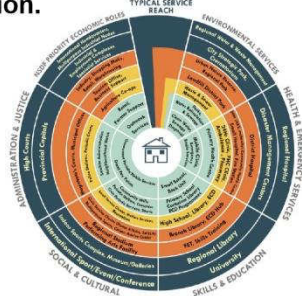
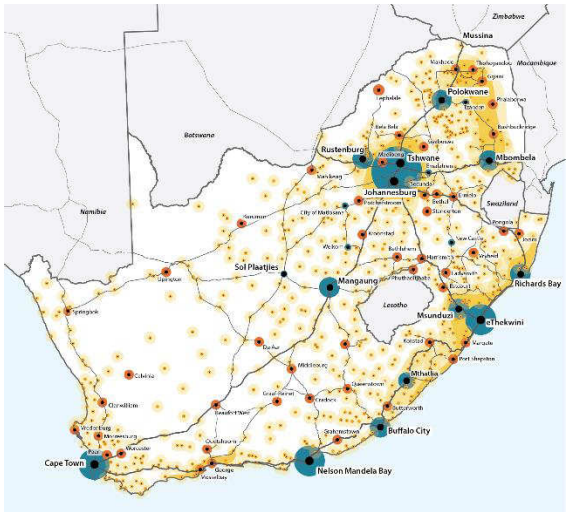
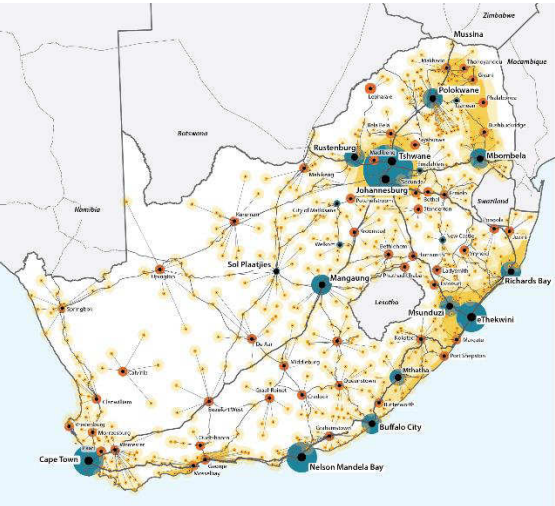


Table 7: Frame 5: Spatial Guidance and Priority Focus Areas-National Social Service and Settlement Infrastructure System

NATIONAL SOCIAL SERVICE AND SETTLEMENT INFRASTRUCTURE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>5.1 Prioritised rural service centres</p>  <p>See Annexure: Frame 5 for legibility and spatial description</p>	<p>Develop prioritised nodes for settlement consolidation and service access points.</p>	<ul style="list-style-type: none"> Identified points of growth and or existing development. Act as points of settlement consolidation in rural areas especially in areas of high value agricultural and ecological infrastructure. Provide local social and settlement infrastructure to meet requirements for human wellbeing and service efficiency. These places serve as areas to consolidated rural livelihoods, provide financial and social services to rural population, and support, agriculture production, enterprise development, services and manufacturing as well as logistic support to smaller geo-specific activities, i.e. smaller mines or power installations, local mills, etc. Limited new growth or development in human settlements with exceptions in special cases. Focus on upgrading and/or maintenance of existing infrastructure in line with town growth or decline. 	<ul style="list-style-type: none"> Identify and strengthen strategically located rural-urban anchor towns through consolidated settlement and rural economic development interventions – especially within the dense eastern coast and inland areas of the country, and the eastern escarpment and former Bantustan homeland areas.

NATIONAL SOCIAL SERVICE AND SETTLEMENT INFRASTRUCTURE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
<p>5.2 Rural-rural connections and supportive infrastructure</p>  <p>See Annexure: Frame 5 for legibility and spatial description</p>	<p>Invest in rural-to-rural public transport and other transport and communication linkages with rural anchors to enable access to higher order services and economic functions. Enhance linkages within rural regions.</p>	<ul style="list-style-type: none"> • Ensure that feeder roads from communities are in accessible condition in order to access local service town. It must enable reasonable level of accessibility and there must be climate-resilient roads. • Establish ICT hubs in service towns and expand gradually into surrounding dense communities. • Rural access roads: Maintenance is critical, as is upgrading of connections between and to rural settlements. 	

NATIONAL SOCIAL SERVICE AND SETTLEMENT INFRASTRUCTURE SYSTEM	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
RESILIENT REGIONAL DEVELOPMENT ANCHORS AND RURAL HINTERLAND LIVELIHOODS	SPATIAL GUIDANCE AND DIRECTION	GAME-CHANGING INTERVENTIONS REQUIRED	FRAME PRIORITY AREAS
5.3 Consolidated settlement development and growth No graphic	Limited new growth or development in human settlements, especially in arid parts of the country.	<ul style="list-style-type: none"> These consolidated settlements support rural hinterlands and or provide niche service in terms of tourism/local niche production or small scale geo-specific economic production activities. Especially in the drier west, but applicable to all low-density remote areas residents should be encouraged and supported to be self-sufficient. This includes off grid water, electricity and sanitation as well as food production. Good ICT linkages can be used to support distance learning and access to other social services is limited, and reliant of private transport. 	Resilient rural hinterlands and consolidated sustainable settlements must be supported through regional rural development and consolidated sustainable settlement patterns.
	Settlement development in traditional authority areas requires local and regional spatial restructuring.	<ul style="list-style-type: none"> Identify and support municipalities and tribal authorities to prioritise nodes that will serve as rural development and service provision anchors, and other role players and national sectors to contribute to investment intent. Collaboration in regional rural and settlement development planning and management is required. 	<ul style="list-style-type: none">

6.7.3 Priority interventions required to mitigate risks and kick start action

In summary, the **interventions** can be described as:

- Network of Rural-Urban Anchors: *Do new things*;
- Rural-rural connections and supportive infrastructure: *Do better and do more of*;
- Prioritised small rural service centres: *Do less of and do better*; and
- Resilient rural hinterlands and livelihoods: *Do new things*.

The immediate **high-priority actions** are:

- **Identify and strengthen strategically located rural-urban anchor towns** through consolidated settlement and rural economic development interventions.
 - The role of certain settlements as gateways and interchanges on the regional public transportation network must be clearly identified and incorporated into the planning of functional rural regions. Optimize connectivity of tribal areas and rural settlements with surrounding higher-order urban settlement and economic systems.
 - More productive agriculture, beneficiation and economic diversification of high-functioning rural regions must be done around rural anchors (i.e. priority anchors, not wall-to-wall) by enhancing connectivity through the provision of supportive infrastructure.
 - Support nodes that will serve as rural development and service provision anchors. Specifically focus on areas of population concentration that lack well-functioning, compact settlements that can serve as rural service

centres to access social services. Civil servants working in these anchor towns need to be encouraged to stay in these towns and contribute to the local economy, instead of commuting to larger towns or cities on a daily or weekly basis. However, in many such towns, various elements of well-functioning settlements are missing, e.g. urban structure and density-thresholds, while tenure issues, and a lack of basic and high-quality social services need to be attended to over the medium-term.

- As proposed in the NDP, special attention must be given to densification along transport corridors in former homelands.

- **Rural-to-rural connectivity needs to be improved**, especially within the Eastern Growth Corridor and Eastern Escarpment dense settlement regions.
 - Investments in high-speed ICT infrastructure, and cellular and data coverage must be prioritised in rural areas as catalysts for regional and local economic development, education, innovation and trade/exchange.
 - Rural road maintenance and upgrading is crucial, given the importance of access and the life-threatening impacts of extreme rainfall events and storms.
- **Limited expansion and development of new settlements in arid areas.**
 - This relates especially to the drier western part of the country but is also applicable in all low-density remote areas. In existing settlements, residents should be encouraged and supported to become self-sufficient. This includes off-grid water, electricity and sanitation services, as well as food production. Good ICT linkages can be

used to support distance-learning and provide access to other social services. Temporal settlement formation for mining or large-scale projects need to be discouraged and housing provision focussed in existing towns with viable futures.

- **Settlement development in traditional authority areas require local and regional spatial restructuring.**

- Identify and support municipalities and tribal authorities to prioritise nodes that will serve as rural development and service provision anchors. Settlements with large populations and/or that serve large populations in their hinterlands and that are densifying, and have economic growth potentials, should be developed as strong rural anchors for surrounding settlement systems. These areas play a key role, not only for the surrounding rural population, but also act as attractors for urban-rural migration and domestic tourists⁴.
- Strong rural anchors should be the focal points of institutional development, improved land tenure systems, bulk infrastructure provision, and regional and local economic development. They should also serve as 'anchors' of a new rural paradigm, where innovations in tribal land administration, land tenure systems and rural housing models can be piloted. Where possible, public sector investments in housing, infrastructure services and special projects should serve to improve the spatial integrity of tribal areas and rural settlements by focussing on strategic infill locations and integration within the existing village fabric.

- Collaborative spatial development planning and land use management need to be pro-actively brokered in tribal areas, with consideration of the spatial constructs, lexicon, phenomena and/or special land uses that form part of traditional practices in particular places.
- Actively support regional-scale settlement consolidation, effective small-scale farming management and enterprise opportunities related to environmental management and restoration in Strategic Water Source Areas, and areas that harbour high-value agriculture potential.

Spatial accountability for strategic rural-urban anchor development and consolidation of national settlement patterns, with contextual specific considerations for arid, high value agriculture and/or growth regions will (1) require collaboration between multiple role-players and (2) be guided by clearly defined 'regional spatial outcomes'. Careful consideration of impact, as well as active support of the spatial patterns guiding rural development, agrarian reform and settlement development will be required from national sector departments and agencies. Significant regional collaboration between provincial role players, tribal leaders and municipalities will also be required within the context of rural regional spatial planning and the phasing and impact of coordinated transformation initiatives.

- Growth regions for urbanisation will need support from initiatives such as the IUDF and the DHS Master Plan, specifically with regard to the financial viability of settlements, as well as regional scale collaboration with a strong focus on (1) private sector, (2)

⁴ See McKelly et al, 2017.

civil society city government involvement, within the context of implementation guidance provided in the NSDF.

- Collaboration between long-term infrastructure planning and implementation in support of sustainable national development, as well as phasing thereof will be critical. Coordinated phasing and re-evaluation of corridor development routes to support the flow of people and goods and not just mining-related resources between IPAP, NATMAP 2050, and the NSDF, will be crucial.
- Corporate social investment from mining companies, independent power producers, etc. needs to contribute to consolidation and not proliferation of rural settlement patterns.

Capacity and resource implications will need to be assessed and attended to at regional scale by the national departments responsible for municipal, integrated spatial, human settlement, rural development planning, with support and monitoring to ensure that development in these areas, as proposed and managed by Provincial and Municipal SDFs, actively contributes to the ability of these areas to be radically transformed and for rural regions and rural-urban anchors and rural hinterlands to be resilient and support quality rural livelihoods and thriving economies.

PART SEVEN: IMPLEMENTATION FRAMEWORK

7.1 Introduction

The implementation of the NSDF focuses on how it guides and informs spatially targeted action across government and society in a manner that *works within the current and emerging systems of planning and related budgeting processes*. 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 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. Working as a core component in this space, the NSDF has to drive and enhance shared, integrated, cohesive and combined state action.

Implementation, like planning, is not a once-off step. It is 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.

Five objectives frame the implementation approach of the NSDF. These consist of three enabling components and two change and transformation-driving components.

The three **enabling components** are:

- A *championing capability*;
- 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.

The five **objectives** are thus *to ensure that the NSDF is:*

- *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 center 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 SDFs/IDPs, PGDSs, 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 objectives is discussed in more detail below.

7.1.1 Objective One: Championing and Guiding NSDF Implementation

The DPME is the best placed centre of government department to champion the NSDF and spatial transformation. As such, it is proposed that DPME provides the political, technical and administrative as related to national spatial planning and associated activities. Given the

significance and importance of this function, consideration should also be given to structuring this support through 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; and
- Report on *implementation* of the NSDF and the extent to which outcomes are achieved.

Three functions would be important, amongst others. *First*, to work across government to align spatial action to the NSDF. This would be both at the strategic levels of the 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 and to work with learning organisations, civil society and other bodies to improve spatial planning capability. *Third*, 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 discussed under **Objective 5** below.

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 DPME and including CoGTA and National Treasury. 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

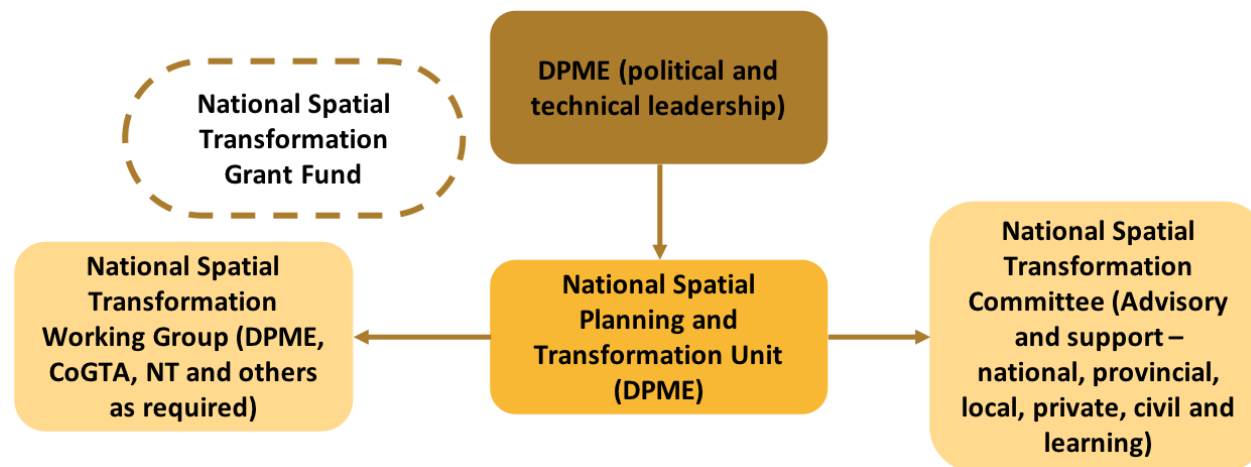
government, the private sector, academia and professional bodies. Although drawing on the NSDF, this committee would have a broader focus and be composed with the aim of informing the spatial transformation agenda of government. Given the important role of evidence, monitoring and knowledge-sharing, this capacity needs to be enabled. 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 taking cognisance of current structures and processes, to avoid duplication and to ensure alignment, e.g. with the IUDF Working Group.

A priority for the Unit, with support from DPME's political and technical leadership, should be to engage in discussions with National Treasury on the development of a grant or other funding mechanism, to support transformation objectives. The exact focus of this grant would need to be developed in consultation, but aspects could include those relating to supporting spatial transformation initiatives of national significance (including those identified as key interventions by the NSDF), spatial planning and transformation

capacity, and planning for improved alignment of projects and programmes.

Figure 40: Championing of Spatial Transformation



7.1.2 Objective Two: Communication for 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.

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'

- departments⁵, 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 communicating the NSDF to municipalities.

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

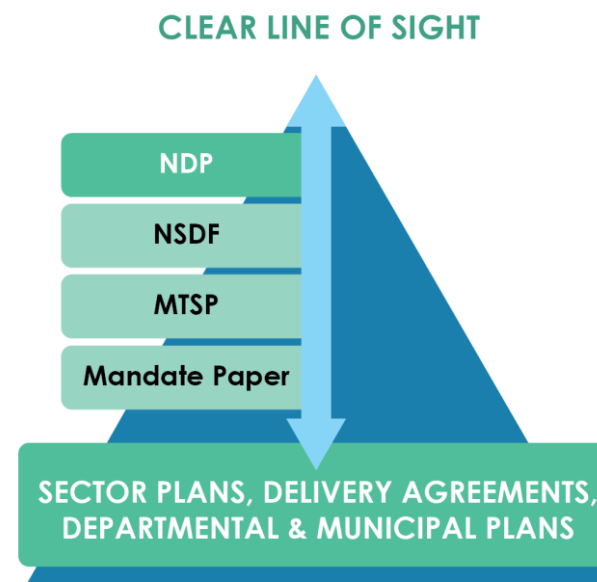
SPLUMA, together with the NSDF, provides the basis for a coherent spatial planning system in support of the development agenda of government (as articulated in the NDP). There are current processes in government aimed at (1) institutionalising the planning system, and (2) strengthening the role of spatial planning. Consideration now needs to be given to how this 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 Medium-Term Strategic Framework (MTSF);
- Inform 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

These initiatives all relate to 'centre of government' activities undertaken by The Presidency, DPME, CoGTA, DRDLR and NT, amongst others.

Figure 41: Clear Line of Sight



⁵ 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.

Suggestions for discussion include:

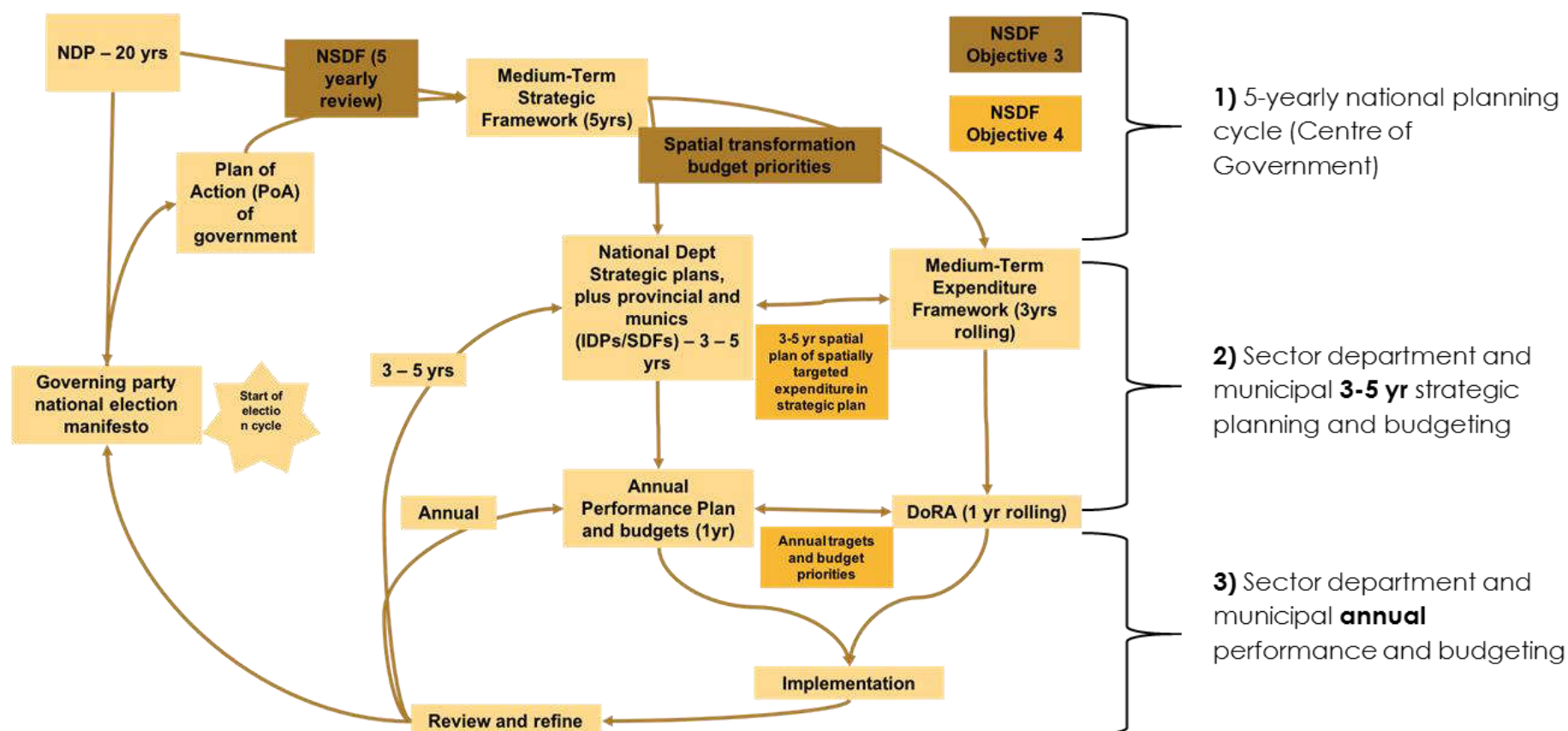
DPME	<p>DPME utilizes the NSDF to provide the spatial lens to the Medium Term Strategic Framework (MTSF).</p> <p>In line with the above, the DPME utilizes the NSDF as the spatial representation of the Mandate Paper (annually) prioritization and the MTSF (5-year cycle).</p> <p>That the DPME, with the help of the Committee (see Objective 1), monitor the alignment of sector budget spending in physical space in line with the NSDF.</p>
National Treasury	<p>In recognising the role of the NSDF in coordinating spending in space, that NT requires that national sector departments provide an indication, both spatially and through priorities, as to how their budgets (especially long-term infrastructure) and programmes align to and reinforce the objectives of the NSDF.</p> <p>That this spending and prioritization is monitored and reported on.</p>
COGTA	<p>That alignment is built between the NSDF and the IUDF implementation mechanisms and procedures.</p> <p>That CoGTA supports the developmental, place-based and regional approach of the NSDF through capability-building and other related initiatives (refer to Objective 5 below). This approach could take the form of regional intervention starting with PGDSs (and possibly associated RSDFs), and/or focus stakeholder interaction and</p>

DRDLR	<p>investment around specific regional issues without the preparation of a PGDS/RSDF.</p> <p>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.</p> <p>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.</p>
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Figure 42 below illustrates conceptually the interface of the NSDF with the national system of planning, budgeting, implementation and monitoring as discussed under **Objective 3** above and in **Objective 4** to follow. The key milestones of the implementation and monitoring system are as follows:

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 Medium-Term Strategic Framework 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 MTSF – a spatial depiction of the MTSF. Annually the Mandate Paper identifies key priorities, likewise, there should be spatial investment priorities identified drawing the NSDF. NSDF Implementation **Objective 3** talks to this.

Figure 42: National Role in System of Planning, Budgeting, Implementation and Monitoring



2) Taking their cue from the MTSF and NDP, sector departments and municipalities formulate their strategic plans (3-5yrs depending) and National Treasury develops the budget (Medium-Expenditure Framework) according to the same logic. The proposal in NSDF

Objective 4 is that sector departments and municipalities 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 (performance) plans and budgets need to identify targets for each against the long-term strategic plan.

7.1.4 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

Provincial Government

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).

That Provincial Governments explore practical ways of utilizing the NSDF as an important contextual frame for the preparation of their PGDSs and PSDFs.

Local Government

That consideration be given by local governments to practically using the NSDF as a crucial frame for their IDPs, SDFs and long-term strategic planning.

Citizens and Civil Society Organisations & the Private Sector

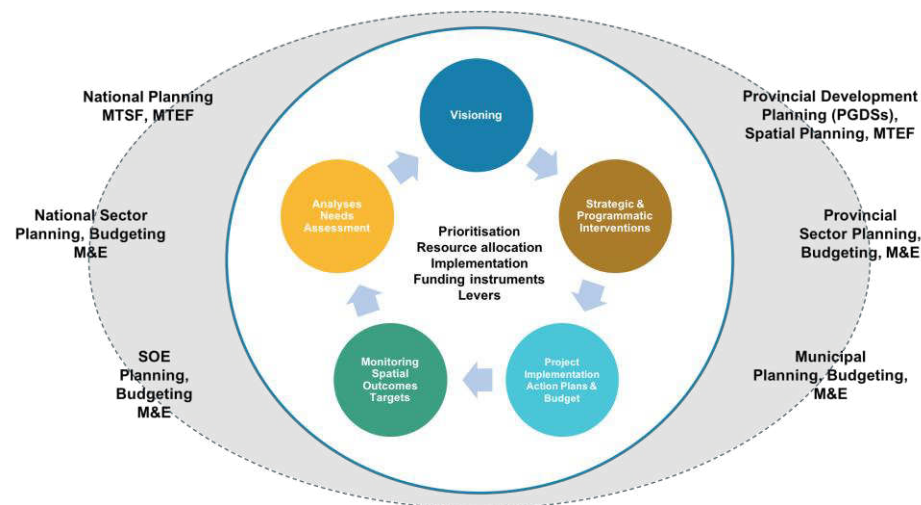
That citizens, civil society organisations and the private sector are encouraged to engage proactively and on a continuous base with the NSDF, to ensure that their investment and spending decisions (1) respond to, and support local needs, and (2) actively contribute to inclusive economic growth and spatial transformation.

Learning Institutions

Learning institutions are encouraged to 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.

Spatial Frames specifically contributes to spatial alignment and impact through:

Figure 43: Role of NSDF in Alignment of Plans and Strategies



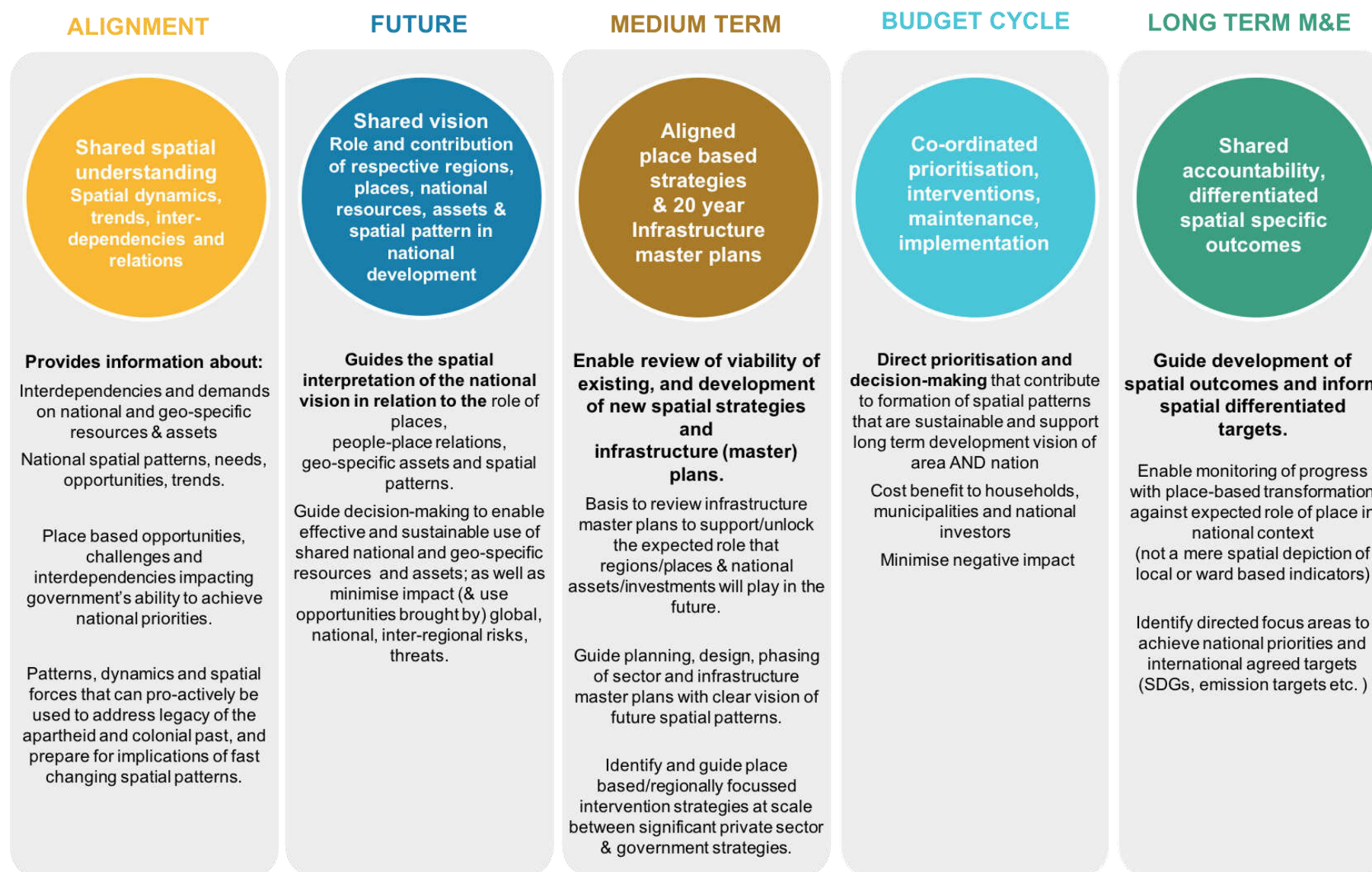
The 'National Spatial Frames' also play a key role in the spatial alignment of Government's planning instruments and cycles:

7.1.5 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 spatial frames. The implementation actions and targets are outlined in the following section (**Section 7.2**)

The NSDF supports improved investment impact and alignment of (1) national integrated and sector plans, and (2) provincial and regional plans and strategies. Within the context of these instruments and government's 5-year planning and review cycle and process, the NSDF

Figure 44: Role of National Spatial Frames in Spatial Alignment



7.2 Implementation Actions and Targets

The spatial frames provide the basis for targeted action.

The tables on the following pages summarise and prioritise these frames as a basis for guiding implementation and monitoring, and should, as such, be read in conjunction with the spatial frames, where the proposals are contextualised and explained.

While the priorities and complimentary actions are considered necessary actions to enable spatial transformation, on their own they are insufficient, as they are located within the broader developmental vision of the NDP. Importantly, these should be viewed as the basis for guiding a process of engagement and collaboration that will be shaped by changing circumstances requiring constant adaptations and refinements. Implementation always is a process

7.2.1 Urban Regions, Clusters and Development Corridors as Engines of National Transformation

To ensure and sustain national economic growth, drive inclusive economic development and derive maximum transformative benefit from urbanisation and urban living.

Overall Aim:

A system of national urban regions where (1) people and economic activity concentrate, (2) high density social networks develop, and (3) people access higher-order services, all of which enables:

- National and regional productive capacity, industrialisation, employment and enterprise establishment and growth;
- Inclusive economic growth, spatial transformation and collective well-being; and
- Effective and efficient resource utilisation and resilience.

Note: The overall aim is complimentary to the IUDF. The NSDF provides context and national perspective on priority areas within the national space.

Key enabling actors

In order to drive and support achievement of the aims, this component of the NSDF will need to be championed by CoGTA and National Treasury and actively supported by DHS, DPME and DRDLR and the metropolitan municipalities. There are other specific role-players who need to play vital roles, including SALGA, amongst others. These players should form a key sub-committee of the National Spatial Transformation Working Group or similar.

Table 8: Immediate Priorities (2019 – 2024)

Target	Actions	Champions
Have in place a clearly articulated, transparent, well managed and non-political process for urban land expropriation supported by the identification, allocation and rapid servicing and zoning of well-located land for various forms of tenure.	A national process has already been initiated under the IUDF Working Group to put this system in place. The recognition of this in the NSDF serves to highlight the critical importance of this process and its successful conclusion.	CoGTA, DHS, NT, DPME, DRDLR and SALGA

Target	Actions	Champions
All metropolitan and intermediate cities have identified, in their SDFs and associated IDPs, well-located land parcels for use and where necessary expropriation , that are suitable for infill development, along with the expected tenure types, services and facilities required.	Metropolitan and intermediate cities to initiate a process of well-located land review, along with ownership, development opportunities and constraints, and to package these into a catalytic land development programme. Guidelines for this process must be developed.	Metropolitan and Intermediate Cities: <i>Well-located land reform and development programmes</i> . DHS: Housing programmes and funding support CoGTA/NT/DPME: <i>Guidelines</i> .
The growth, development and urbanisation of the eastern half of the country is acknowledged and planned for.	Initiate a specific focus on the development needs and responses in the eastern half of the country, with specific focus on towns in former homelands, urban cores and eastern coastal cities.	This will require a collaborative and cross-sectoral initiative between CoGTA, DHS, DRDLR, NT, Provinces (<i>guidance and support</i>) and Municipalities (<i>SDFs, land-use management and IDPs</i>).
Plans and programmes are in place for the economic diversification and improved urban management of fast growing cities in the Central Innovation and Mining Belt .	Initiate a specific focus on the pathways to economic diversification and improved human settlements in the Central Innovation and Mining Belt.	This will require a collaborative and cross-sectoral initiative between CoGTA, DRDLR, NT, Provinces (<i>guidance and support</i>) and Municipalities (<i>SDFs, land-use management and IDPs</i>).

Table 9: Important Complimentary Targets (2019 – 2050)

Target	Actions	Champions
Mega-City regions as focus for urbanisation and economic growth are sustainably managed and are adequately served with water and municipal	The Mega-City region municipalities must proactively identify land and infrastructure investment priorities in anticipation of future growth. Infrastructure investment and maintenance will become	Municipalities, supported by appropriate national government capacity and resource funding (DHS, CoGTA, NT).

Target	Actions	Champions
infrastructure and enjoy an adequate, diverse and nutritional supply of food.	increasingly critical, and long-term plans to guide this need to be developed and constantly reviewed.	
	Development of specific mechanisms to (1) enable higher densities, (2) provide suitable housing choices, (3) alleviate pressure on basic and social service provision, (4) undertake urban land reform, (5) support skills development in growing economic sectors, and (6) focus on youth development and employment at scale.	Municipalities supported by CoGTA, DHS and NT must draw in relevant national and other sector departments. Partnerships with learning organisations, civil society and private sector will be necessary.
	An in-depth exploration of the long-term impacts of climate change on liveability, urbanisation, and national spatial development patterns, e.g. (1) concentration towards the east of the country, (2) increased pressure on long-distance distribution of water and the availability and cost-implications of alternative water sources (e.g. desalination), (4) food production, and (5) low/no-carbon energy generation.	DRDLR, DHS, DPME, CoGTA and NT working in close collaboration with Municipalities and other support agencies.
The potential for new economic growth corridor development on identified routes is explored, and initiatives to strengthen	Assess and plan for currently identified routes:	Department of Transport/SANRAL, Provinces and Municipalities.

Target	Actions	Champions
viable routes are developed and implemented.	<ul style="list-style-type: none"> • Witbank/Newcastle to Richards Bay; and • Extension of N2 in the Eastern Coastal Region 	

7.2.2 Productive Rural Regions and Regional Development Anchors as Foundation for National Transformation

To ensure national food security, rural transformation and rural enterprise development and quality of life in rural South Africa through a set of strong urban-rural development anchors in functional regional-rural economies.

Overall Aim:

A diverse, differentiated and transformed rural economy that enables national food security, economic development, employment and equity. This will be enabled through maximizing high-value agricultural land, developing agri-enterprise regions and agri-innovation clusters along with well-located small-holder farming, increased dividends from the oceans and aqua economy, and by unlocking new, highly productive agricultural areas through improved irrigation and innovation.

Key enabling actors

In order to drive and support achievement of the aims, this component of the NSDF will need to be championed by DAFF and actively supported by DRDLR and provinces. There are other specific role-players who need to play vital roles, including DST (ICT) and Transport, amongst others. These players should form a sub-committee of the National Spatial Transformation Working Group or similar.

Table 10: Immediate Priorities (2019 – 2024)

Target	Actions	Champions
Effective protection of national high-value agricultural land is ensured.	In consultation with partners, and based on research, to identify, extend and protect high-value agricultural land (central heartland).	DAFF, provincial agriculture departments and the DWA.
Clearly articulated and initiated land reform and agri-sector development plans are introduced and budgets are allocated to strengthen and support smallholder farming.	Identify areas to be targeted for small-holder farming activities in close-proximity to markets and protect such areas from urban and other types of non-agricultural encroachment. Municipal and Provincial SDFs to highlight these opportunities and PGDS and IDPs to articulate approaches and budget with support of DAFF.	DAFF, provincial agriculture departments, the DRDLR and Municipalities.
Agreement is reached on how effective land administration and secure tenure systems in tribal areas can be implemented.	A national process to establish an effective land administration system that brings security of tenure is required to unlock agricultural potential in tribal and former homeland areas. A process of consultation, led by the Department of Rural Development, in partnership with CoGTA, needs to be undertaken to address this.	DRDLR, CoGTA, Traditional Leaders, relevant provincial sector departments, municipalities and civil society.
Rural-urban anchor towns are identified and plans initiated to develop and strengthen their role in providing access to services and economic diversification.	Identify priority rural anchors Develop strategies for developing their role in productive agriculture, beneficiation and economic diversification	Provincial Growth and Development Strategies, aligned sector departments (including DAFF, DHS and CoGTA) and municipalities.

Table 11: Important Complimentary Targets (2019 – 2050)

Target	Actions	Champions
Targeted agri-enterprise regions with associated reform and development strategies that successfully contribute to national economic growth, equity and employment are in place.	Undertake specific and targeted investigations, in collaboration with relevant sector departments and municipalities, to develop long-term plans for the development and transformation of identified agri-enterprise regions with associated infrastructure investments (e.g. roads and market access).	DAFF, the DRLDR, relevant provincial sector departments and municipalities.
Aqua and mari-culture development is expanded to utilise and maximise all opportunities.	Continued development and roll-out of aqua and mari-culture development projects.	DAFF
Oceans economy opportunities are sustainably exploited.	Continued development and roll-out of oceans economy development and sustainable utilisation.	DEA, DAFF, DoT, DMR (as and where required), relevant provincial sector departments and municipalities.
Rural-to-rural connectivity in Eastern Growth Corridor and Eastern Escarpment dense settlement regions through ICT and well-maintained and upgraded road linkages	<p>Prioritisation of ICT infrastructure investments</p> <p>Prioritisation of connector road upgrading and maintenance</p>	DST, Provincial and Municipal Roads.

7.2.3 National Ecological Infrastructure System as Enabling Infrastructure for a Shared and Sustainable Resource Foundation

To enable sustainable and just access to water and other national resources to ensure quality livelihoods for current and future generations.

Overall Aim

Restoration and management of national fresh water bodies and strategic water source production areas for (1) water availability, (2) national well-being, (3) food security, and (4) sustainable economic development.

- Sustainable ecological functioning at the landscape level (supporting climate change adaptation); and
- Ecological infrastructure provides valuable ecological services directly to people.

Investment in ecological infrastructure is utilised to (1) create new enterprise and green economic opportunities and associated employment opportunities, (2) alleviate poverty, and (3) reduce inequality.

Key enabling actors

In order to drive and support achievement of the aims, this component of the NSDF will need to be championed by DEA and actively supported by SANBI, SANParks and DWS. There is a key enabling role for municipalities through their SDFs. These players should form a key sub-committee of the National Spatial Transformation Working Group or similar (with an appropriate mechanism to represent municipalities, perhaps via SALGA).

Table 12: Immediate Priorities (2019 – 2024)

Target	Actions	Champions
National/Provincial Protected Areas have clearly identified their role in water security and provision through their strategic plans and associated budgets. The identification of new protected areas that coincide with vulnerable Strategic Water Source Areas.	In consultation with relevant partners, review current plans for protected areas and highlight their role in water security. Identify Strategic Water Sources to be targeted for declaration as protected areas. DEA and SANBI, working with civil	SANParks, SANBI, DEA, provincial and local protected area bodies.

Target	Actions	Champions
	society and government counterparts, should convene and monitor the process.	
All provincial and municipal SDFs have identified and developed guidelines for the protection and management of Critical Water Sources within their areas of jurisdiction, and have incorporated information on Critical Biodiversity Areas, amongst others, to inform this process.	Provinces and Municipalities, in reviewing and re-doing the SDFs must specifically address water security within their areas of jurisdiction, but also acknowledge where their resources contribute to national water security. IDPs and PGDS must identify budget and associated actions to protect and manage water security. All the actions should focus on both (1) water demand management and (2) water-supply.	Municipalities, Provinces, and SANBI to support with data on CBAs.
Competing land development practices which undermine the role of Critical Water Source Areas have been identified and addressed.	Specific action plans are developed to address areas where land-use and water competition and pollution are causing risks to water security. Specific areas of concern are the Nkangala, Olifants, Waterberg, Umgeni, Berg and Breede River Catchments. Coordinated intervention in these regions needs to be prioritised.	Catchment Management Authorities and provincial governments in cooperation with relevant national sector departments and municipalities.
Management Guidelines for Strategic Water Source Production Areas. National development and management guidelines have been developed for strategic water source areas and National Freshwater Protection Areas.	Four actions: (1) finalise and promulgate guidelines, (2) raise awareness of how guidelines are to be applied, (3) coordinate and monitor action, and (4) provinces account for ecosystem quality.	DEA, SANBI and provincial governments.

Table 13: Important Complimentary Targets (2019 – 2050)

Target	Actions	Champions
Protected Areas: New protected areas have been declared as part of a national strategy to secure and capitalise on Strategic Water Source Areas.	<p>Areas that are critical for water security must be identified.</p> <p>Areas that are critical for water security must be taken through a process to ensure formal protection.</p> <p>Economic and other opportunities for addressing poverty and unemployment are addressed as an integral part of declaring and managing Protected Areas.</p>	DEA, SANBI, national and provincial conservation bodies, and private conservation bodies.
National ecological Infrastructure is adequately protected and restored, and national socio-economic benefit is achieved.	<p>Assessment of land-uses that negatively affect stream flow and/or water quality (e.g. mining, plantations, overgrazing) is curtailed and avoided.</p> <p>Strategies are developed to improve management and benefits of ecological infrastructure.</p> <p>Provincial and Municipal SDFs must identify and provide guidelines for compatible activities and land-uses.</p>	DEA, SANBI and provincial governments and municipalities in their SDFs.
International and National Resource Conservation Areas are well managed and contribute to water security,	Through effective partnering and associated work, CBAs, Ramsar Sites and Trans-	DEA, SANBI and provincial governments and municipalities in their SDFs.

Target	Actions	Champions
<p>biodiversity conservation and through this, to economic development and equality.</p>	<p>frontier Parks are recognised and protected as national assets.</p> <p>The role of Level Two CBAs, and Level One and Two ecological support areas is acknowledged and managed in accordance with their role in the national ecological infrastructure system.</p> <p>CBAs and support areas are reflected in provincial and municipal SDFs and appropriate guidelines for land-uses are developed.</p>	

7.2.4 National Connectivity Infrastructure Networks as Enabling Infrastructure for a Shared, Sustainable and Inclusive Economy

To develop, expand and maintain an effective, sustainable and affordable transport, trade and communication network in support of national, regional and local economic development and transformation.

Overall Aim:

A national space economy supported by sufficient, appropriately designed, technologically robust and well-maintained national economic infrastructure. This is enabled through:

- Upgraded infrastructure networks in major urban areas and towns to accommodate far higher densities and intensities, the construction of infrastructure networks in former township areas at scale, and the provision of quality public spaces, pedestrian walkways and efficient, affordable and safe public transport networks for use by all;
- Constantly upgraded and maintained urban municipal service infrastructure and large-scale investment of municipal infrastructure in regional growth points and service towns; and
- Investment in (1) renewable energy generation, storage and distribution, (2) smallholder farming and agro-processing, (3) innovation, (4) tourism, culture and entertainment-led economic growth, and (5) knowledge-creation, beneficiation, packaging and transfer/dissemination.

Key enabling actors

In order to drive and support achievement of the aims, this component of the NSDF will need to be championed by a variety of national sector departments as appropriate: DE – Energy, DWS – water, DoT – Ports and Trade connectors and DMR – Mining. Given the economic significance of these, support and engagement with DTI, EDD, NT and associated SOEs will be required. These players should form a key sub-committee of the National Spatial Transformation Working Group or similar.

Table 14: Immediate Priorities (2019 – 2024)

Target	Actions	Champions
A clear, properly resourced plan for water availability and management of inter-dependencies is in place.	A collaborative process to identify infrastructure and management needs to ensure long-term water availability, especially to prioritised regions and economic sectors is initiated.	DWS, DPW and provincial governments.
Regional economic diversification plans are put in place for priority areas.	A long-term plan for the development and management of the Core Innovation and Mining Belt must be prepared. A long-term plan for the development and management of the Mpumalanga Coal-fired Power Stations must be prepared.	DMR, DoE, Eskom, CoGTA, DTI, EDD and mining companies.
Opportunities for renewable energy production to secure long-term energy security are secured.	<p>A collaborative process is put in place to extend programmes aimed at securing and procuring renewable energy, as well as ensure the introduction of regulatory reforms to enable municipal renewable energy production and support.</p> <p>The necessary regulatory reform to enable local government and private sector to develop the renewable energy sector is put in place.</p>	DoE, Eskom, NT and NERSA.

Table 15: Important Complimentary Targets (2019 – 2050)

Target	Actions	Champions
National long-term infrastructure plan with associated phasing and priorities is in place.	Along with the SIPs, there is a need to craft a collaborative long-term, future-orientated modelling and scenarios instrument for the planning and sustainable construction, maintenance and upgrading of South Africa's infrastructure, with a focus on national and inter-regional land and sea based connecting infrastructure.	Process to be led by DTI and DoT.

Special Considerations for the National Spatial Planning and Transformation Unit and Working Group:

The ability to assess national, regional and place-based developmental impact and/or the contribution of geo-specific national economic infrastructure investments will be essential. Awareness needs to be raised on interdependencies. A phased approach and transparency with regards to priorities, plans, phasing, and risks is required. Overall, coordination is critical, and this is what this entity will be well-placed to do.

7.2.5 National Social Service Infrastructure System as Enabling Infrastructure for National Well-Being

To ensure effective access to the benefits of high quality basic, social and economic services in a well-located system of vibrant rural service towns that act as urban-rural anchors and rural-rural connectors.

Overall Aim

Rural areas that sustain vibrant communities with good access to high-quality services. This is enabled by a sustainable and vibrant network of consolidated regional and rural nodes and markets that (1) sustain the national economy, (2) realise the potential of the natural rural resource foundation, and (3) enable effective rural-rural connectivity and mutually beneficial connections to urban areas and economies.

Key enabling actors

In order to drive and support achievement of the aims, this component of the NSDF will need to be championed by SALGA working closely with provinces. There are key linkages to national sector departments required on certain elements – for example DHS, DoT and EDD). These players should form a key sub-committee of the National Spatial Transformation Working Group or similar.

Table 16: Immediate Priorities (2019 – 2024)

Target	Actions	Champions
Rural-urban anchor towns have been identified and plans are in place for their development.	Using the NSDF and Provincial Plans as a base, identify settlements located on regional public transport routes to be prioritised as gateways. Consider how connectivity to tribal areas and rural settlements can be optimised. Consider how the economies of these anchors can be enhanced and supported/diversified.	Provinces in consultation with municipalities and other relevant sector departments as and where appropriate (e.g. Transport, Human Settlements, and Economic Development). PGDSs, in particular, must engage with this matter.
The physical and tele-communication networks to connect rural areas to the national and regional economy is put in place.	ICT infrastructure investment and access roads are prioritised and enabled. Rural road maintenance and upgrading is undertaken as a key economic and social enabler.	DST, provinces, municipalities and the private sector. Provincial and Municipal Roads Departments with support from DoT and possibly EPWP/CWP.
Facility investment is concentrated in a network of accessible settlements related to a hierarchy services that are linked to	Identified highly accessible and concentrated network of towns and settlements for critical social infrastructure	SALGA, National Treasury, DPW, Human Settlements, COGTA (IUDF, Department of Health or any other

the role of places and the importance of towns in serving regional rural hinterlands.	services (aligned to the size of current and projected population, the role of the towns and settlements as typically indicated in the Service Wheel, located to reach as many people as possible from the smallest number of service points.	relevant department or their successors in collaboration with provinces and municipalities.
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Table 17: Important Complimentary Targets (2019 – 2050)

Target	Actions	Champions
Plans on the provision of off-grid services in remote and arid areas are in place.	<p>In remote and arid areas of the country, prioritise and support off-grid and other means to ensure sustainable and affordable access to services (water, electricity and sanitation).</p> <p>ICT access is a critical enabler in remote areas and should be prioritised.</p> <p>No new settlements or towns should be supported in remote and arid areas (e.g. those associated with temporary mining projects).</p>	<p>Provinces with support from DoE and DWA.</p> <p>Provinces, DST and municipalities.</p>
Settlements in traditional authority areas are well managed and perform an effective service provision and developmental role.	Identify settlements in traditional authority areas with large populations, that serve large hinterlands and that have economic potential. Develop long-terms plans, in line with the NSDF and PGDSs, for the	Provinces, and municipalities <i>with support</i> from provinces.

Target	Actions	Champions
	development and management of these areas. This will require collaborative spatial development planning and land use management.	

Special Considerations for the National Spatial Planning and Transformation Unit and Working Group:

Active support for the guidance of rural development, agrarian reform and settlement development will be required from a variety of national sector departments and agencies. Significant regional collaboration between provincial role players, traditional leaders and municipalities will be required within the context of rural-regional spatial planning exercises and the phasing and impact of coordinated transformation initiatives.

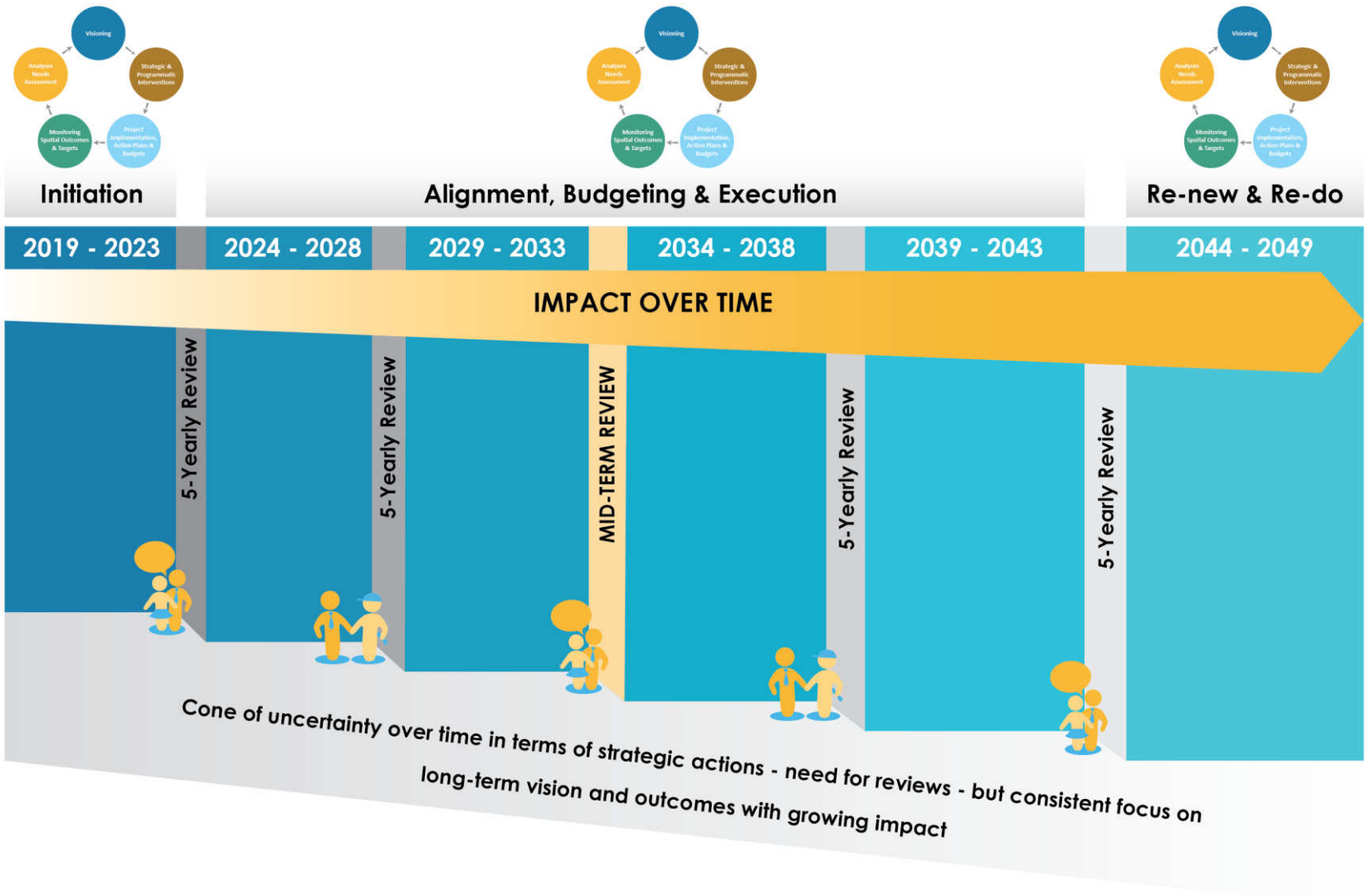
7.3 Implementation Planning

The NSDF has two key target dates:

- 2030: In alignment with the NDP
- 2050: In recognition of the long-term infrastructural and other investment 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'. Within the complex government planning system, spatial alignment and contribution is focussed and shifts over time:

Figure 45: NSDF Implementation Cycles



- **Cycle 1 – Initiation: 2019 – 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 as discussed in **Objective 1** and ensuring broad communication and awareness, as discussed in **Objective 2**. 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); and
 - Awareness of the NSDF and its implications across all three spheres of government, learning organisations, civil society and learning organisations (measured by acknowledgement in the MTSF and MTEF and use of and reference to the NSDF vision in alignment of national sector plans, PGDSs and municipal SDFs/IDPs).
- **Cycle 2 – Alignment, budgeting and execution: 2024 – 2043:**
 - Here the focus is on alignment of spatial strategy and medium-term plans;
 - This cycle is broken up into four five-year cycles corresponding with the MTSF cycles over the period. In this phase the aim is to build on the foundation laid in the initiation phase to focus on **Objectives 3, 4 and 5**.
 - In the first 5-year cycle (2024 – 2028), the main focus would be on **Objective 3** (Institutionalisation) and **Objective 4** (Embedding). The key targets in this phase include:
 - Use of the NSDF in the 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 (**Objective 5**) identified in the NSDF Spatial Frames (measured by project progress on priorities and budget allocations).
- **Cycle 3 – Renew and re-do: 2044-2049**
 - 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 46** below, and the shifting focus of NSDF implementation over time is shown in **Figure 47** on the following page below.

Figure 46: NSDF Implementation Cycles Overview

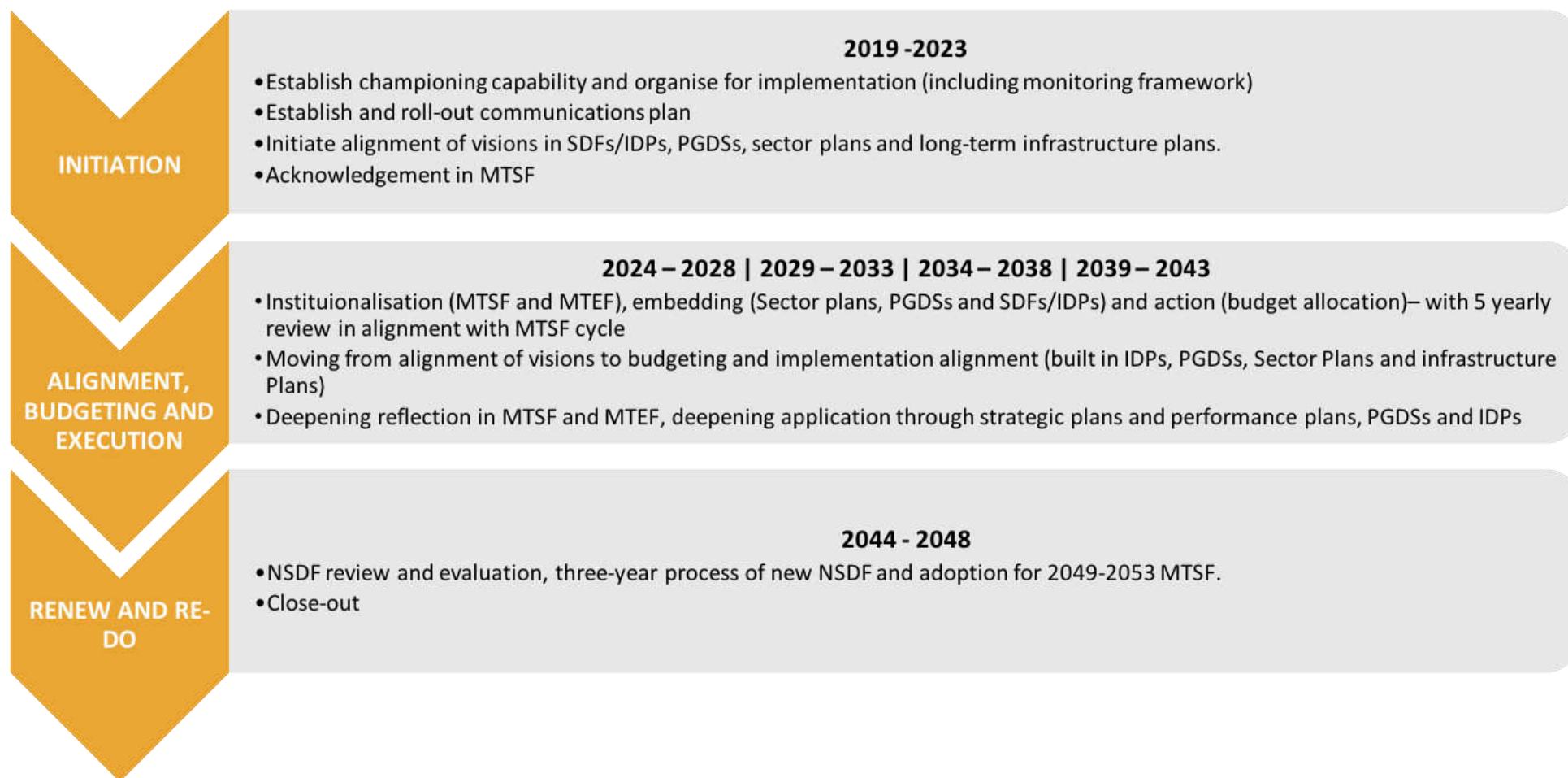
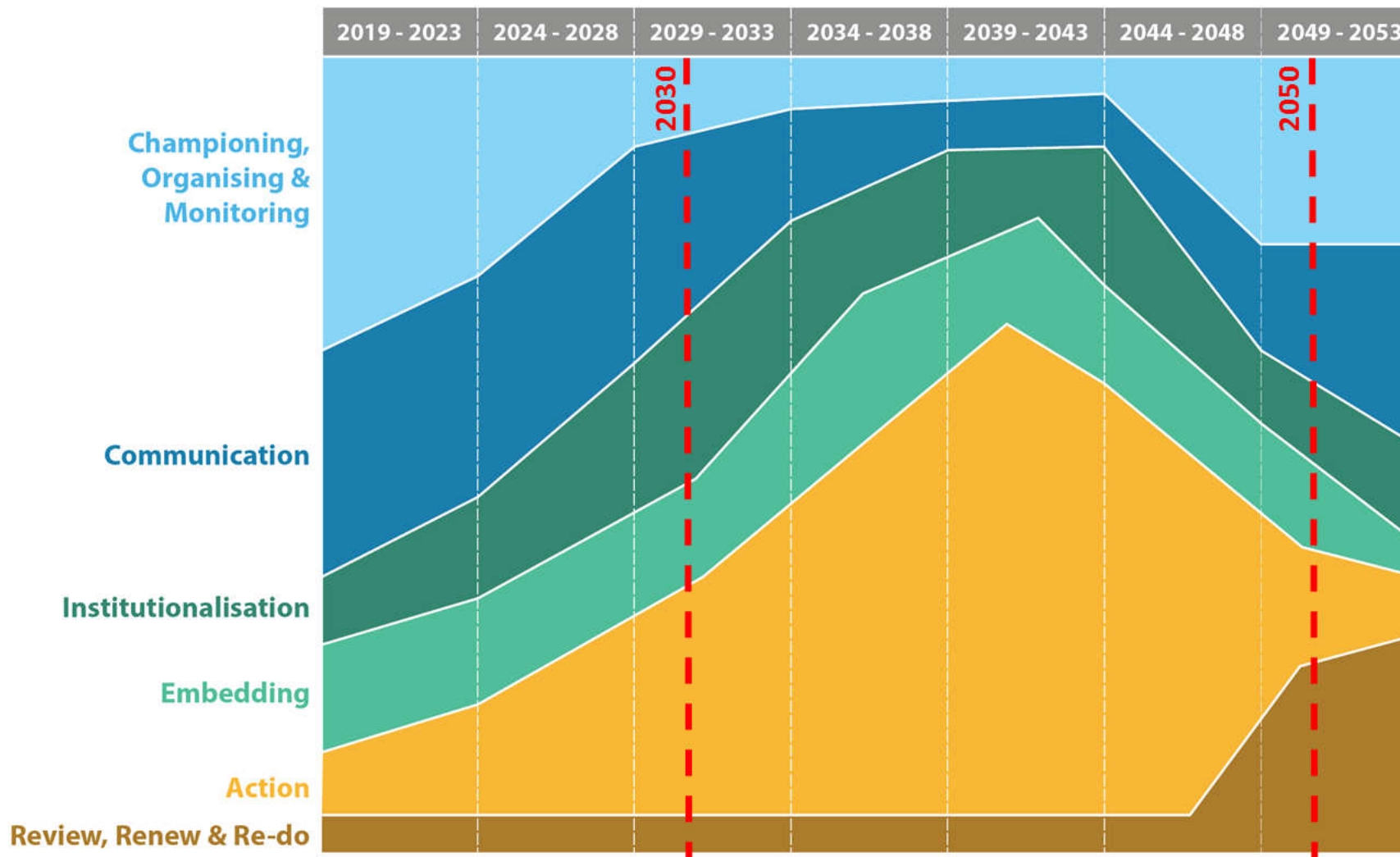


Figure 47: NSDF Implementation - Level of focus over time



7.4 NSDF Reviews

As noted in **Section 7.2** above, 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. Regular five-yearly reviews are thus proposed. Whilst these reviews may result in some key shifts in focus, it is to be expected that the key vision elements and spatial priorities and transformations as envisaged, will continue to guide action. This focus on the outcomes is thus seen as the way to both enable changes and shifts in strategic focus, whilst holding true to the spatial transformation and improvement outcomes captured in the vision.

7.5 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 through the compilation of the NSDF.

PART EIGHT: 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, consisting of five national spatial development frames, 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 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>
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- 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>
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- ⁱ State of the Nation Address by the President of the Republic of South Africa, Mr Cyril Ramaphosa, 16 February 2018, Parliament.
- ⁱⁱ Report of the High-Level Panel on the Assessment of Key Legislation and the Acceleration of Fundamental Change. (2017). Page 32.
- ⁱⁱⁱ As quoted in The National Development Plan (2012). Page 24.
- ^{iv} 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).

^v CSIR, 2018 (a). South Africa Functional Town Typology - Maritz, J., van Huyssteen, E. Green, C. and Sogoni, Z. South African Functional Town Typology (CSIR 2018 v2). Available at http://stepsa.org/socio_econ.html#Indicator

The Mesozone set is a demarcation of South Africa into a complete grid of 25 ,000 spatial units. These mesozones are not uniform in shape but aims to be approximately the same size (~50km²). These mesozones were created in such a way that they fit completely within the current municipalities and other significant geo-economic and historic area demarcations. The zone boundaries correspond with major travel barriers (such as rivers) as well as 'break lines' between sparsely populated areas (such as mountains) and areas with medium to high levels of human activity (such as fertile valleys or built up areas). The various datasets are assigned to mesozones based on an algorithm developed by the CSIR and which is based on the principles of dasymetric mapping. An approach based on dasymetric mapping principles is used to calculate population distribution. The 1996 (EAs), 2001 (SPs), 2011 (SPs) and 2016 (SPs) population figures are the input data for the respective years which are then re-aligned to the mesozones to create a comparable time series data set. The Spot Building Count (SBC), ESKOM being the data custodian, is used as the secondary dataset to predict the underlying statistical service of the origin data.

The GVA data for the different economic sectors are produced on local municipal level by Quantec. The municipal level data is then assigned to the mesozones using the principles of dasymetric mapping where secondary data representing the potential points where production is occurring are used to re-assign the economic production data to the mesozones. The total employment index per mesozone is derived from the GVA index discussed above. The way in which this was calculated was by firstly calculating the ratio of the of GVA production per sector to the employment figure per sector for each local municipality. The employment and GVA data for the different economic sectors are produced on a local municipal level by Quantec. This factor is then multiplied with the economic production values per mesozone.

CSIR, 2018 (b) Population Projections

CSIR, 2018 (b). Greenbook Project Population Projections, CSIR and StatsSA (2018)

Population projections and location specific scenario modelling for South Africa has been undertaken by the CSIR which has been made available to the NSDF (CSIR/IRDC Green Book on Climate Change Adaptation 2018) and used to explore the most likely spatial implication of population projection scenarios for low and high in-migration scenarios (considering population growth as well as migration patterns and spatial locational attraction). The modelling approach, inputs and high level results are set out below.

^{vi} SA CSIR MesoZone 2018v1 Dataset: Dataset produced by CSIR.

^{vii} The west is dry and sparse while the east is dense and relatively wet. The division of west and east was based mostly on an agricultural productivity layer. SA CSIR MesoZone 2018v1 Dataset: Dataset produced by CSIR; Agricultural Productivity: Dataset provided by Mandala GIS.

^{viii} CSIR, 2018 (c). Greenbook Climate Change Projections, CSIR (2018)
Council for Scientific and Industrial Research. (2016). Settlement design guidelines for climate change adaptation in South Africa. CSIR. Pretoria: CSIR.;
Griffin, J. (2012, April 3). The Impact of Climate Change on South Africa . Retrieved June 13, 2018, from Climate System Emergency Institute;;
https://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.

^{ix} Acknowledgement: The NSDF acknowledges contribution from the interdisciplinary research project funded by a grant from the International Development Research Centre (IDRC) as well as a grant from the CSIR Long-term Thematic Programme. The interdisciplinary research project called “The Greenbook” was commissioned with the aim of supporting municipal planning on the development of climate-resilient cities and settlements through research in climate adaptation. The NSDF was able to draw from population projection and climate change modelling scenarios developed for this project to explore 2050 scenarios for population growth and climate change implications for cities, towns and regions in South Africa.

^x SA CSIR MesoZone 2018v1 Dataset: Dataset produced by CSIR. The interpolated dataset was produced for the NSDF project.

^{xi} Transport connections – graphically drawn – based on NATMAP 2015 as published by the National Department of Transport. (<http://www.transport.gov.za/web/departement-of-transport/natmap-2050>); Fishing and Aquaculture – NATMAP spatial data; SA CSIR MesoZone 2018v1 Dataset: The interpolated dataset was produced for the NSDF project by CSIR.

^{xii} Comparative Analyses of Economic Size and Growth, indicating the bigger economies and relatively high growth in the central, and urban core areas, with growth above national average evident in the eastern coastal and southern coastal regions. Low, slow and negative growth evident in the large economies around Gauteng (Blue is bigger economy and red small, higher than national average growth indicated by black and bigger circle, actual decline in red dot). GVA data: Dataset produced by Quantec., Municipality Layer: Dataset produced by the Demarcation Board.

^{xiii} The two maps display population growth per mesozone in the two sides of the country. The population growth is represented as an addition or subtraction in absolute numbers per mesozones between 1996 and 2011. SA CSIR MesoZone 2018v1 Dataset: Dataset produced by CSIR; StatsSA Census: Provided by StatsSA

^{xiv} SIC sector data density values for agriculture (SIC1), mining (SIC2), Services (SIC6-9) based on 2013 Quantec data (2013) related to mesozone information – see SA CSIR MesoZone 2018v1 Dataset: Dataset produced by CSIR through density interpolation.; Green Economy (original data indicating projects) – Department of Environmental affairs - EGIS, 2017. (Also see <https://egis.environment.gov.za/>)

^{xv} SIC sector data density values for government service (SIC9) is based on 2013 Quantec data (2013) related to mesozone information – see SA CSIR MesoZone 2018v1 Dataset: Dataset produced by CSIR through density interpolation.; Economic data density values for total production is based on 2013 Quantec data (2013) related to mesozone information – Dataset produced by CSIR through density interpolation.

^{xvi} The social vulnerability index is a composite indicator, created statistically through principal components analysis. The index makes use of verified, routinely available public data hence it can serve as a tool for tracking and monitoring change brought about by policy intervention investments. The index was derived from a Principal Component Analyses (PCA) on a ward level using the South African 2011 national census data. The PCA was based on 14 variables (household size average, age dependency ratio, percentage unemployed, percentage people below property line, percentage rural population, percentage shacks, percentage education, percentage disabled people, percentage female head of households, percentage population without electricity, percentage households without telephone lines, percentage people without a car, percentage people without public water, percentage immigrants) each representing an aspect of social vulnerability within a community as identified through national and international research. The highlighted municipalities are home to 60% of the country's 0 - 14 year olds. StatsSA 2011 Census Social Vulnerability Index: http://stepsa.org/social_vulnerability.html. StatsSA 2011 Census: StatsSA

^{xvii} The map shows all the officially proclaimed terrestrial and marine protected areas in South Africa. South Africa Conservation Areas Database (SACAD_OR_2017_Q4). CSIR MesoZone 2011 Dataset

^{xviii} The map shows areas in the country where food production occurs with a distinction between average to high potential areas. Areas were identified where small-scale farming schemes can potentially be promoted..The agriculture production data layer is the result of the combination of existing studies on agricultural activity and potential. The two sources used is a) crop fields from the National Department of Agriculture as well as land capability 2016 from 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 is currently in the process of an update of this data layer and it will eventually be replaced by the newer version. The selection of suitable sites for small scale farming are influenced by the following criteria and considerations:

- High potential agricultural land based on land capability. This may not always be the case depending on the nature of activity i.e. if hydroponics etc. is considered.
- Agriculture infrastructure in existence or planned. High priority was given to planned Agri-hubs and agro-processing. In Addition, the proximity to fresh produce markets and other processing facilities and infrastructure is important.
- Proximity to cities and identified growth regions. This is probably one of the most important criteria. Access to growing markets as well as the range of facilities it offers, is of utmost importance for the sustainability of small scale farming. This includes proximity of social facilities like schools, health and social support.
- Availability of sources of water. The majority of sites are located downstream from existing dams to ensure good gravity feed. In some areas, water from known groundwater aquifers were selected. Examples include: Kuruman (NC), Dendron Area (Lim), Lichtenburg area (NW), Westonaria (GT).
- Areas where LRAD programs cluster in proximity to cities and growth regions were also considered.

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- Only areas with slopes of less than 6% were selected.

Land Capability - National Department of Agriculture Forestry and Fishing (2017); Cropfields Provincial Sets - National Department of Agriculture Forestry and Fishing (2007 – 2010)

^{xix} Main economic production areas – Quantec GVA values related to mesozone level by CSIR. Original GVA values can be sourced from Quantec; Road network enhancement – NATMAP 2015. Provided by the National Department of Transport.

^{xx} 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

^{xxi} Mining information – Council for Geoscience, 2017. Existing mining activity as an interpolation of such points to see where clusters of mining are; The following layers are interpretations of spatial data in combination with other information: Declining mining, new mining and main broad focal points for mining; Main Economic production areas – Quantec GVA values related to the mesozone unit level by CSIR.