



REPUBLIC OF GHANA

**SPATIAL DEVELOPMENT FRAMEWORK FOR THE
NORTHERN SAVANNAH ECOLOGICAL ZONE
(2015-2035)**

Executive Summary



GOVERNMENT OF GHANA

MINISTRY OF ENVIRONMENT, SCIENCE, TECHNOLOGY AND INNOVATION
NATIONAL DEVELOPMENT PLANNING COMMISSION
SAVANNAH ACCELERATED DEVELOPMENT AUTHORITY
TOWN AND COUNTRY PLANNING DEPARTMENT

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Spatial Development Framework for the Northern Savannah Ecological Zone

2015-2035

*Efficient Settlements, Functional Economies and
Sustainable Environment*

Volume III

EXECUTIVE SUMMARY

(Of Volume I & II)

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GLOSSARY OF TERMS / ABBREVIATIONS

| | | |
|-------|---|--|
| ADB | - | Asian development Bank |
| BBC | - | Bolgatanga- Bawku Cluster |
| BOST | - | Bulk Oil Storage and Transportation |
| CIDA | - | Canadian International Development Agency |
| CSIR | - | Council for Scientific and Industrial Research |
| FtF | - | Feed the Future Programme |
| GCAP | - | Ghana Commercial Agricultural Project |
| GFZB | - | Ghana Free Zones Board |
| GSS | - | Ghana Statistical Service |
| JHS | - | Junior High School |
| MESTI | - | Ministry of Environment, Science Technology and Innovation |
| MMDAs | - | Metropolitan, Municipal and District Assemblies |
| MDAs | - | Ministries, Departments and Agencies |
| MTDP | - | Medium Term Development Project |
| NIP | - | National Infrastructure Plan |
| NDC | - | Nkwanta Dambai Cluster |
| NDPC | - | National Development Planning Commission |
| NSDF | - | National Spatial Development Framework |
| NSEZ | - | Northern Savannah Ecological Zone |
| RCC | - | Regional Coordinating Council |
| ROC | - | Regional Oversight Committee |
| UDS | - | University for Development Studies |
| SADA | - | Savannah Accelerated Development Authority |
| SDF | - | Spatial Development Framework |
| SHS | - | Senior High School |
| STMA | - | Sekondi Takoradi Metropolitan Assembly |
| TBC's | - | Tamale – Buipe Cluster |
| TCPD | - | Town and Country Planning Department |
| USAID | - | United Nation Agency for International Development |
| WJC | - | Wa Jirapa Cluster |
| YGC | - | Yendi Gushiegu Cluster |

Foreword

The Northern Savannah Ecological Zone (NSEZ) has generally lagged behind the Southern part of Ghana in terms of socio-economic development. The zone is presently characterized by sluggish economic level of productivity, high dependence on small holder agriculture (largely rain-fed) etc, and a net contributor to poverty in Ghana.

In order to close the development gap between the NSEZ and the South, the Savana Accelerated Development Authority (SADA) in collaboration with Ministry of Environment, Science, Technology and Innovation (MESTI), National Development Planning Commission (NDPC) and Town and Country Planning Department (TCPD) initiated and prepared a Spatial Development Framework (SDF) for the zone with financial assistance from the Global Environmental Fund of the World Bank. The SDF provides a strategic vision for the spatial and economic development of the NSEZ geared towards achieving massive economic transformation and securing better lives through efficient settlements and sustainable environment.

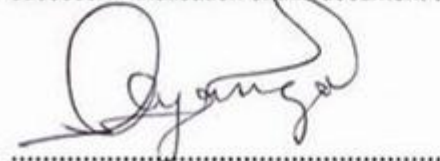
The Spatial Development Framework provides a holistic and detailed analysis of the current socio-economic situation within the NSEZ and proposes solutions aimed at addressing the issues so identified. It presents a critical understanding of the historical antecedents from both policy and economic perspectives that have influenced development within the zone. The framework provides in-depth spatio-economic analysis, demographic, spatial pattern, infrastructure, environmental (including climate change) and land use analysis.

The outcome of the analysis reveals the untapped economic potentials of the various parts of the zone. These potentials when developed hold the key to turning the zone into a more vibrant and productive economy with inestimable job creation opportunities aimed at providing better spread and variety of job opportunities for a better quality of life.

In order to harness these potentials, the SDF recommends the creation of a more balanced regional development where every settlement maximises its potentials and plays its unique functional role irrespective of location and size. The essence of this is to form stronger synergies within the settlement networks or clusters.

It is anticipated that the SDF will provide the requisite guidance and information for investments and the preparation of other levels of plans by Ministries, Departments and Agencies (MDAs), Regional Coordinating Councils (RCCs) and Metropolitan, Municipal and District Assemblies (MMDAs), especially within the zone. Regional and local authorities as well as government agencies and the private sector will have key roles to play in the implementation of the NSEZ Spatial Development Framework strategies. Continuous public participation and awareness creation is key in ensuring sustainability in the implementation of the plan.

Appreciation goes to all stakeholders who contributed immensely to the preparation and successful finalisation of this document of national importance.



Hon. Mahama Ayariga (MP)

(Minister of Environment, Science Technology and Innovation)

Acknowledgments

The Town and Country Planning Department appreciates the individuals and organizations that have contributed their time, energy and views in diverse ways toward the formulation of the Spatial Development Framework for the Northern Savannah Ecological Zone. The various individuals who attended a series of technical and regional stakeholder consultations and provided immeasurable technical insights and information are greatly appreciated. It is your contributions in the form of data, comments, suggestions, and dedication to seeing the success of the preparation of the SDF for the NSEZ that helped shape the SDF from conception to its finalization.

The invaluable efforts of the Regional Coordinating Councils (RCC) and Regional Oversight Committees (ROCs) of the Upper East, Upper West, Northern, Brong-Ahafo and Volta regions cannot be overlooked as they actively participated in the regional stakeholder consultations and the technical working sessions. Special appreciation also goes to the National Development Planning Commission for their collaborative role during the preparation of the SDF. We recognise the role played by Mr. Kwame Awuah, Director of Spatial Infrastructure – NDPC in this process. The presence of the NDPC’s regional representatives in the regional stakeholder meetings is appreciated.

Special appreciation goes to the Director of Town and Country Planning Department, Mr Lawrence Z. Dakurah and the Team Leader, Mr Chapman Owusu-Sekyere for their technical guidance and coordinating roles. The impressive efforts of Mr. Sylvester Gyogluu, Mr. Anthony Toku Gyamerah, Mr. Zikiru Sulley Shittu and Mr Michael Detoh, (regional directors for Northern, Brong Ahafo, Upper East and Volta respectively). The inputs and collaborative role of the project team of TCPD at the head office is much appreciated.

The Chief Executive Officer of Savannah Accelerated Development Authority (SADA), Mr. Charles Abugri and his project team also deserve special commendation.

We are also grateful to the Ministers and their Deputies, Chief Directors and Directors of the under listed Ministries, Department and Agencies, for their support, throughout the preparation of the SDF. They include:

- a) Ministry of Environment, Science, Technology and Innovation (MESTI)
- b) Ministry of Transport
- c) Ministry of Roads and Highways
- d) Ministry of Food and Agriculture
- e) Department of Urban Roads
- f) Ghana Statistical Service (GSS)
- g) Environmental Protection Agency
- h) Forestry Commission
- i) Regional Houses of Chiefs
- j) Academic Institutions
- k) Civil Society and Non-Governmental Organisations

Finally, particular appreciation goes to the planning team of Town and Country Planning Department - Peter Owusu-Donkor, Kofi Kekeli Amedzro, and Felix S. K. Agyemang for their invaluable technical insight and help in the formulation of the this SDF.

1 INTRODUCTION

This document is the executive summary of the two volumes of the Spatial Development Framework (SDF) for the Northern Savannah Ecological Zone (NSEZ). The Volume I provides detailed analysis of population and settlement growth dynamics, the space economy, land use changes, infrastructure, agriculture, education and health as well as climate change issues pertaining to the NSEZ. Volume II provides policy directions, development strategies, possible development scenarios and the final spatial development framework for the NSEZ.

The executive summary is structured in five main sections. Sections one and two provide the introduction and a summary of the major spatial development challenges and opportunities of the various thematic areas. Section three discusses the vision and summary of key policy proposals to drive the development of the zone. Section four provides detailed discussion of the chosen scenario or spatial development framework for the NSEZ. The last section highlights the critical development projects that need to be undertaken to kick-start the transformation of the ecological zone. It also discusses the prioritization and phasing of the key thematic areas and their associated projects.

2 DEVELOPMENT CHALLENGES AND OPPORTUNITIES

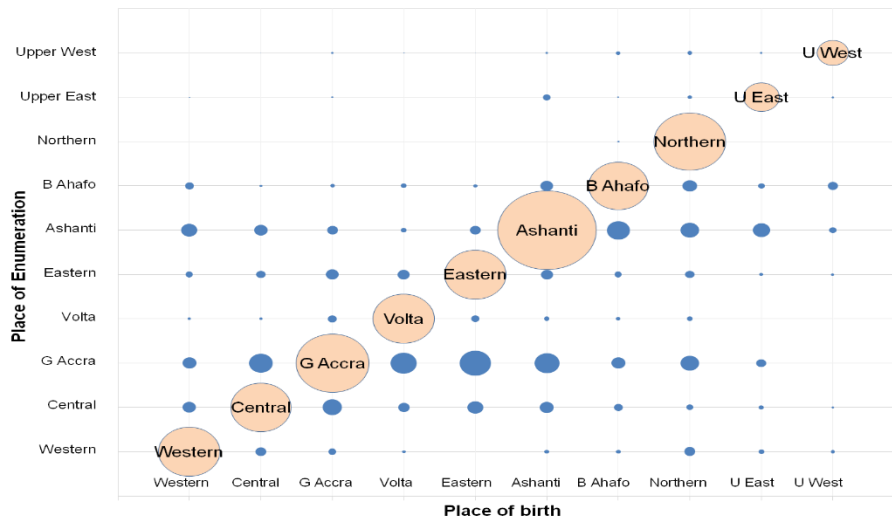
This section provides a snapshot of the NSEZ major development challenges and opportunities of the various thematic areas presented in Volume I with proposals aimed at addressing them for the next 20 years.

2.1 Population Growth and Distribution

The major opportunities and challenges of population dynamics based on trend analysis and projections indicate that the zone will have to deal with these understated issues for the plan period.

- **High out-migration from the zone;** though population has been growing in the zone, a sizeable proportion of the youthful population (active labour force) have been drifting towards the large urban centres in the southern part of the country. From a regional perspective, the Northern, Upper East, Upper West, Volta and Brong-Ahafo regions which fall within the zone lose substantial amount of their population to other regions (See Figure 2.1) .

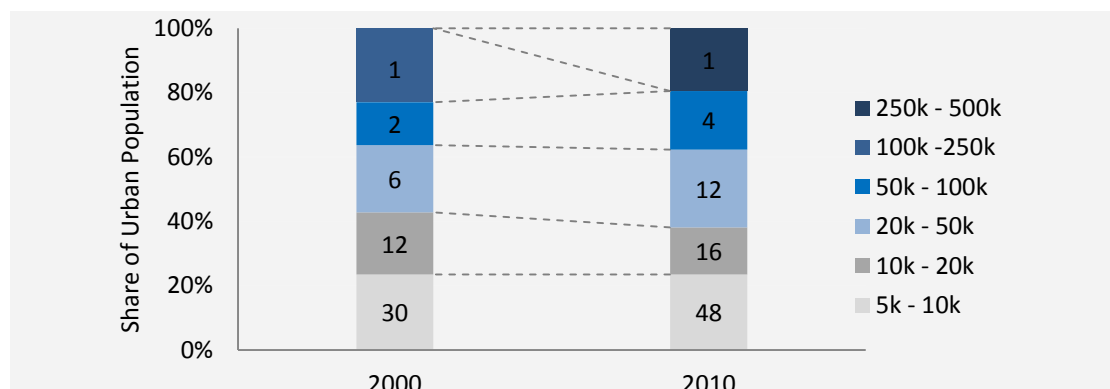
Figure 2.1: Migration Pattern in Ghana, 2000-2010



Source: NSDF, 2015

- Rapid transition of rural settlements into urban settlements and increasing number of smaller urban settlements;** in the NSEZ, there are numerous rural settlements that fall under the population threshold of 5000. Based on the population trend analysis, quite a huge percentage of these rural settlements moved into the urban status (thus 5000 population threshold and over). From Figure 2.2, it is obvious that the least urban class (5,000 -10,000) of settlements experienced the largest increases between 2000 and 2010, while the largest urban class size remained the same though it experienced a growth in population. Growth of smaller urban settlements are increasing and the trend will continue in the years ahead and hence planning efforts should be made to address this phenomenon.

Figure 2.2: Urban Class Size changes, 2000-2010

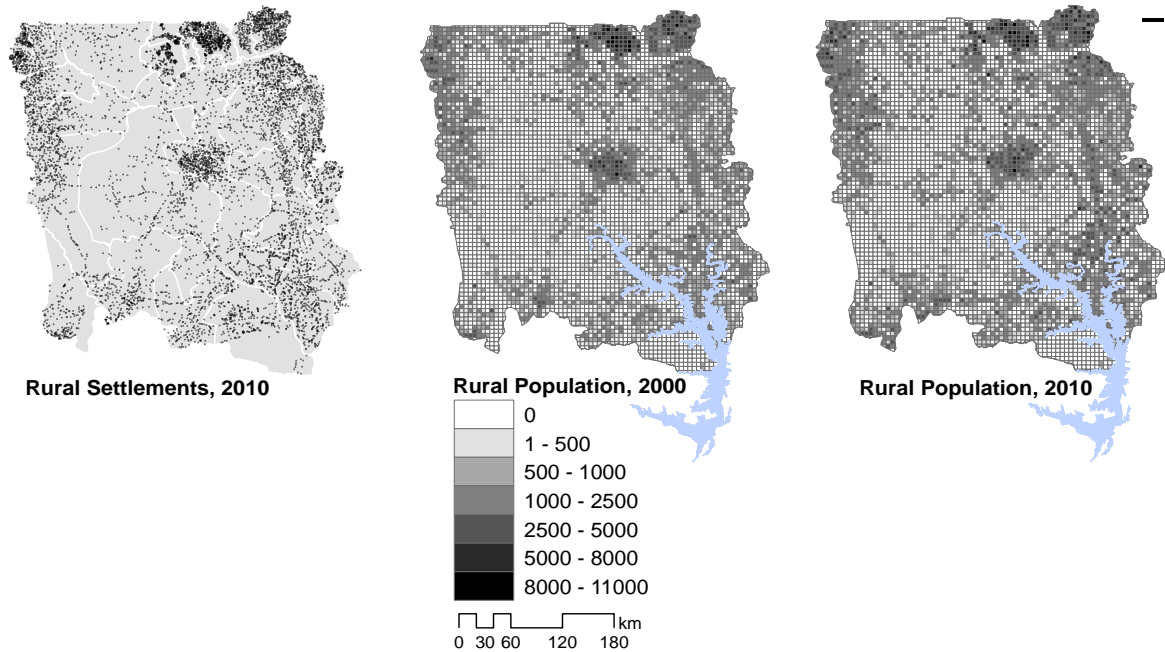


Source: TCPD 2015 based on Population and Housing Census, 2010

- Small and scattered settlements (See Fig 2.3);** most settlements in the ecological zone are mainly rural and are very distant from each other. The low level of population threshold in these rural settlements makes provision of basic services

almost impossible because the minimum population threshold required to provide these services are mostly not reached. For instance, provision of primary school requires a threshold population of around 150. This becomes extremely difficult to attain. It is not surprising that most comparative needs assessment show deficits for the NSEZ compared to the southern part of Ghana. Planning efforts should therefore be geared towards encouraging population concentration or agglomeration to inspire the provision of basic services and infrastructure.

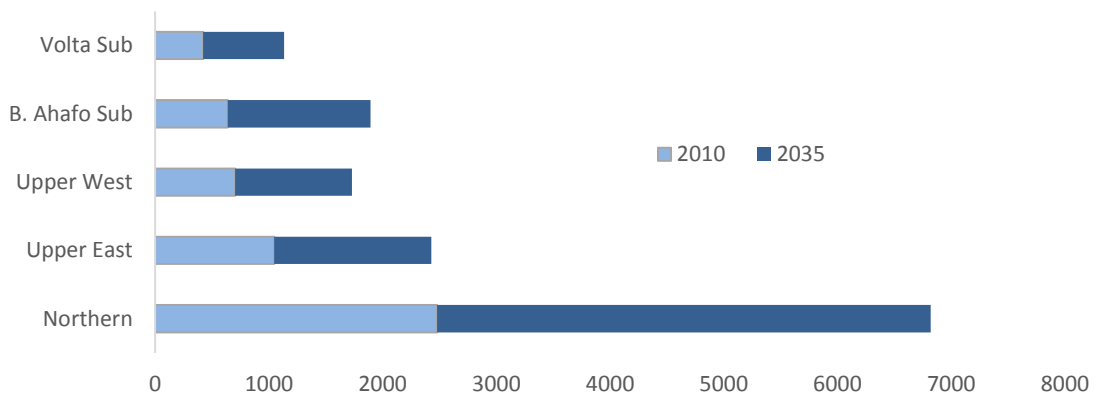
Figure 2.3: Distribution of Rural Settlements, 2010 and Rural Population, 2000 and 2010



Source: TCPD 2015 based on Population and Housing Census, 2010

- **Growing evidence of rural settlements clustering around urban centres in the NSEZ;** the analysis clearly indicates a growing trend of rural settlements clustering around Major urban centres which provides opportunities for building stronger rural-urban synergies for development.
- **More than half of the estimated 8.7 million additional population will be located in the Northern region by the close of 2035 (See Figure 2.4);** the estimated population based on current growth trend indicates that the Northern region will host about 55 percent of the projected population followed by Brong-Ahafo sub-region (17.9%) and Upper East region (9.7%).

Figure 2.4: Projected Population for the NSEZ, 2035



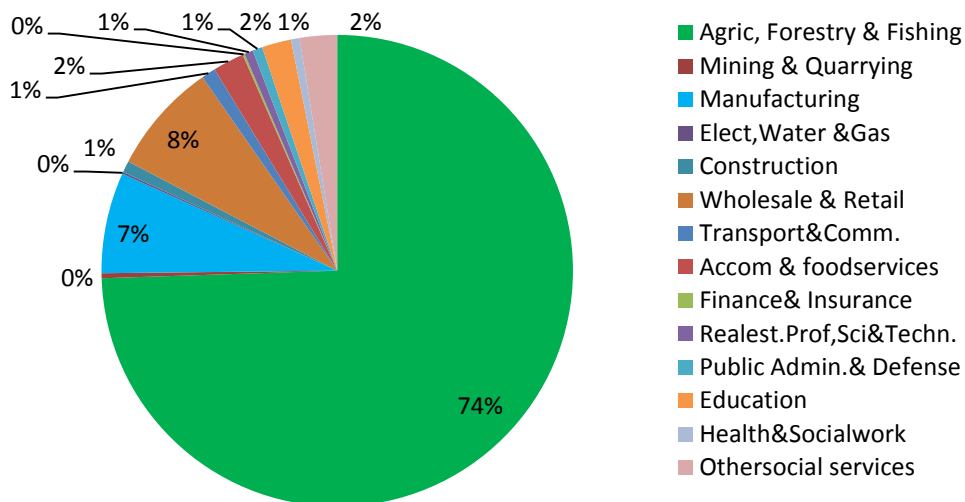
Source: TCPD 2015 based on Population and Housing Census, 2010

2.2 Economic Challenges and Opportunities

The economy of the NSEZ presents a number of challenges as it remains agrarian (mainly on subsistence and rain fed basis) and peripheral to the vibrant southern economy of the country. Despite these challenges there are huge economic development potentials that remain untapped. This section provides a concise view of the challenges and opportunities which the zone faces of which the SDF seek to address in the next 20 years. These include the following:

- The zone has a predominantly large agrarian employment structure with very low income earning capacity;** the agriculture sector employs 74 percent of the working population. On the average, basic average annual salary is around GH¢1,330 indicating a mean monthly income slightly higher than GH¢100. This ranks it as the second to last income earning subsector among all the employment categories. The low level of income earning arises from poor agricultural practices leading to poor production and productivity levels. In addition, other factors like over-dependence on rainfall (one rainfall cycle in the zone), poor feeder road connectivity from farms to market centres, poor soil fertility among others contribute to the low income earnings.

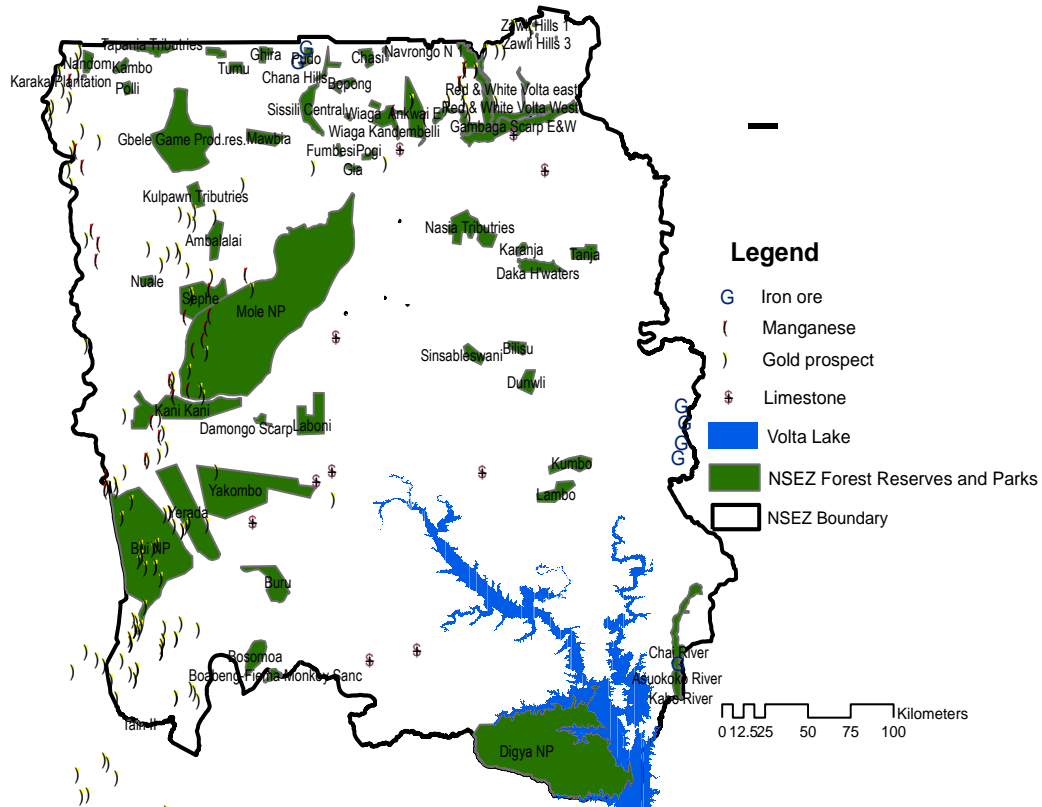
Figure 2.5: Employment Structure of the NSEZ



Source: TCPD 2015 based on Population and Housing Census, 2010

- ***A declining industrial employment base;*** the NSEZ has a very weak industrial employment base which is declining over the years. The Industrial sector which comprises of Mining and Quarrying, Manufacturing, Construction, Electricity, Water and Gas Supply employed a little over a tenth (10.24%) of the NSEZ's active working populace as at 2000. By the close of 2010, the sector's share of employment had shrunk to less than ten percent (8.17%). Industrial sector of the NSEZ has to be properly transformed to generate more employment to increase its percentage share with economic diversification as one of the major goals of the SDF. It is imperative that government establishes special economic zones or industrial enclaves in the NSEZ with better economic incentives such as what pertains in the southern part of the country.
- ***Agriculture remains the largest source of employment for most people entering the job market in the NSEZ;*** over the decadal period (2000-2010), 74 percent of jobs that were created in zone occurred in the agriculture sector. The sector's relative ease of entry could be attributed to the very little skills and capital required coupled with huge availability of land.
- ***Low economic diversification;*** the predominantly agrarian employment structure which stems from the small size of the settlements provides very little or no economic opportunities for the youthful populace searching for jobs. With a perfect knowledge of the low income earnings from the small-holder agricultural practices, they tend to migrate to the large urban centres south of the country where low service jobs have higher income earning capacities than agriculture.
- ***Mining and industrial development potentials;*** Figure 2.6 shows abundance of gold in the Western and North-Eastern parts of the NSEZ. There are also manganese, limestone and iron ore in the NSEZ. It is estimated that the iron ore located in Shieni can be mined for the next 100 years and remains one of the finest in the African continent. The iron ore deposits alone holds large potential for developing a strong mining sector in the initial stages of development and a stronger metallurgical industrial hub afterwards. In addition, all the afore-mentioned minerals have large industrial development potentials.

Figure 2.6: Mineral Resources and Forest Reserves in the NSEZ



Source: TCPD based on data from Forestry Commission and Minerals Commission

- Potentials for developing the tourism industry:** from Figure 2.6, the green areas shows the national parks and forest reserves located in the NSEZ. These constitute more than 75 percent of the total land area of national parks and forest reserves yet the zone receives less than five percent of all tourists in the country (thus both domestic and foreign tourists). This is because the management, planning, marketing and facilities to support the tourist sites are almost not in existence. Furthermore, the transportation networks to link up most tourist sites are in deplorable state discouraging the patronage of such sites.

2.3 Transportation Challenges and Opportunities

The major transportation challenges that the NSEZ faces that must be dealt with within the plan period include the following:

- Missing links between major urban centres in the ecological zone;** there are no direct trunk roads that connect Bolgatanga to Wa, Wa to Tamale and Bimbilla to Tamale etc. Long travelling time is created as a result leading to loss of productive working hours, reduction of the level of spatio-economic interactions and other economic gains.
- Poor water transportation services in the South-Eastern parts of the NSEZ;** the South-Eastern section of the zone is mainly drained by the Volta Lake and its tributaries which makes it expensive for road construction. However, the ferries and canoes that transport passengers and freight are inadequate and highly unreliable. In addition, the landing sites for the ferries

are not properly designed resulting in landing difficulties. Estimates for the year 2018 however shows increasing number of passenger crossings these water bodies and this require massive improvements of the water transport services. See Table below on estimated ridership for 2018.

Table 2.1: Estimated Ridership on Ferries, 2018

| Location | Ridership(2018) | Action |
|---|------------------|-----------------------|
| Major Ferries | | |
| Yeji-Makango | 850,000 | Improvement |
| Ketekrachi –Kojokrom | 630,000 | Improvement |
| Dambai-Dodoikope | 630,000 | Improvement |
| Intermediate Ferries | | |
| Asuouso- Begyemse | 200,000 | Implementation |
| Kpetchu/ Adiembra | 200,000 | Implementation |
| Local Ferries | | |
| Digya Park*/ South Otsu Island- Tapa Abatoase | 120,000 | Implementation |
| Kojokrom – Kete Krachi- Atkagome Sakpo-Otsu Kpedzi | 60,000 | Implementation |

Draft Master Plan of Volta Transportation Master Plan, 2014

- **Poor connectivity between rural areas and urban centres;** the existing feeder roads do not connect quite a number of rural settlements to smaller towns and urban centres. Construction of feeder roads to link rural areas with small towns and urban centres are therefore required to help rural settlers access higher order services in the urban centres.
- **Development of the Buipe inland port to serve as a logistics and freight hub;** this will help reduce the travelling time of commuters from the landlocked countries to the southern part of the country. These commuters move to the southern-most part of the country where the sea ports are located to clear their goods and transport them back to their destinations up north. The development of the Buipe inland port would make the zone and Ghana more competitive and trigger further economic activities.
- **Poor maintenance of existing trunk roads in the ecological zone;** quite a substantial percentage of trunk roads in NSEZ are in bad state characterised with so many pot-holes while certain places suffer from severe sagging. This increases travelling time and causes lots of vehicular accidents.
- **Developing efficient multi-modal transportation system;** this can be done in the most urbanized centres of the ecological zone to prevent chaotic traffic congestions experienced in the southern part of the country. Plan preparation for such projects should commence now so implementation can pre-empt the occurrence of the aforesaid problems.

2.4 Land Use Cover/ Change Issues

The major land use changes that have been experienced over the past two decadal periods (1990-2000) shows that the ecological zone is experiencing rapid changes of which most are

positive. Planning efforts have to contribute to the sustenance of the positive gains while ameliorating adverse effects of land use changes for the 20 years ahead. The general gains, losses and challenges of land use changes include the following:

- **Massive decline in Grassland from 1990 to 2010;** grassland which covered nearly 70 percent of total land area of the NSEZ as at 1990 shrank to about 50 percent by the end of 2010. About twenty percent reduction in Grassland cover were converted to forest and cropland gains.
- **There has been substantial growth in forest cover in the ecological zone;** from 1990 to 2010, forest cover expanded from a little over a tenth of total land area to more than a fifth of the entire land cover. This is could be partly attributed to the numerous afforestation projects embarked upon by the Forestry Commission mainly from the year 2000. Other agro-ecological farming practices by the farmers contributed to these gains.
- **Forest cover gains likely to be lost due to illegal mining and other human activities;** illegal mining, charcoal burning and bush fires put the forest cover gains made over the twenty-year period under threat. Evidence from the field indicates massive destruction of forest cover (cutting of trees) in the Bui national Park by illegal miners in their quest for gold. In addition, bush fires in the NSEZ causes loss of huge acreages of forest cover almost every year.
- **The springing up of new settlements in forest areas;** the springing up of new settlements in forest areas destroy the forest which have long been natured and protected as national assets. The Brong-Ahafo sub-region is where most of these settlements are springing up and hence requires immediate action to halt such practices. Apart from the destruction of the land-cover, provision of basic service ranging from water, education and health facilities which are critical for the growth and development of these new settlements are difficult to come by.

The major educational and health challenges and opportunities include;

- **Inadequate number of health and educational professionals in the NSEZ;** the doctor to patient ratios, nurse to patient ratios and trained teacher to pupil ratios among others are all far below the national average. This leads to poor service delivery as the number of professionals remain woefully inadequate contributing partly to the low student performance and poor healthcare delivery.
- **Inadequate provision of health and educational facilities;** this is more pronounce in rural settlements with sizeable amounts of population base. In addition to that, the siting of the educational and health facilities should be based on strong spatial analysis to prevent situations where most inhabitants have to travel long distances to access basic level of services.
- **Low literacy levels in the NSEZ;** statistics at the district level presented in Volume I at the data analysis stage shows that only Tamale, Wa and Bolgatanga comes quite close to most southern districts in the country in terms of literacy. At the regional scale, the Northern, Upper East and Upper West which cumulatively forms the larger part of the NSEZ have literacy levels far below the national average.

- ***Low attainment of higher levels of school enrolment from basic to senior high school level;*** particular attention should be paid to the development of skills through technical and vocational training systems.

2.5 Climate Change

Climate change is one of the most critical development challenges of the NSEZ. In addition, the NSEZ is currently the main area of the country facing the harshest impacts of climate change. According to various climatic forecasts, the NSEZ will continue to be the hardest hit area of the country in the years to come. Consequently, a number of major issues that are related to the impact of climate change would have to be addressed. Some of these issue include the following:

- ***High likelihood of the agriculture sector being adversely impacted by Climate Change;*** Already, shortening growing periods and unpredictability of rainfall patterns among other factors are adversely impacting on agriculture. Unfortunately, this is a sector that employs more than 74 percent of the working population and remains the largest source of job creation to the new entrants in the job market. Efforts are therefore required to create other job avenues that are less reliant on nature, thus are created through the services sector. Alternatively, modern agro-ecological methods can be used to ameliorate the existing and future adverse impact.
- ***Adverse effects on water dependent infrastructure;*** according to the CSIR, Ghana is poised to experience water stress in the next ten year-period and beyond if existing trends continue. This will affect available water volumes and will possibly cause adverse impact on energy generation capacities of existing and proposed hydro-dams. This will therefore require smart engineering designs that would make maximum use of estimated water volume levels as well as their fluctuation levels.
- ***Adverse impact on water transportation in the NSEZ;*** various forecasts by a number of institutions indicate the water volumes in the Volta basin is likely to decline quite considerably. This would affect water transportation mainly in the areas that are solely dependent on water transport. Engineering solutions should therefore take cognizance of such forecasts and provide solutions through rigorous analysis to help provide efficient water transport services.

Having provided a fair view of the macro-level issues analysed in Volume I. The next section focuses on a detailed discussion on the vision, policy direction, goals and strategies for the NSEZ.

3 VISION, POLICY DIRECTION, GOALS AND STRATEGIES

The vision, policy and strategic goals of the SDF seeks to ensure sustainable and inclusive development that is in line with the strategic goals of the National Spatial Development Framework (NSDF), long term national development agenda, the new global sustainable development agenda and most importantly the development needs of the NSEZ. Detailed sectoral analysis that look at trends, problems and challenges were undertaken and presented in Volume I. A summary is however presented in Section I of this volume. Based on these analysis, government policies and consultation with stakeholders, a vision was developed for the NSEZ. The vision for the NSEZ for the plan period 2015 to 2035 is *“to be a transformed and diversified economy with equal opportunities within a context of spatially efficient settlements and sustainable environment”*.

The vision however has a number of key policy goals (and objectives) as follows;

1. To be a transformed and diversified economy
2. To attain spatially efficient and functional settlement network
3. To create equal opportunities for residents within the NSEZ
4. To achieve environmental sustainability

The subsequent section looks at a mix of objectives and strategies for arriving at the policy goals stated above. However, it must be emphasized that achieving the goal of environmental sustainability for the ecological zone depends on the attaining of the first two goals.

3.1 Goal 1: Transformed and Diversified Economy

To achieve the goal of a transformed and diversified economy for the NSEZ, a number of objectives have to be developed. These objectives together with a number of strategies have been discussed below.

1. **Develop Scientific and environmentally sustainable agricultural systems in the NSEZ.**

As discussed under the agriculture sector in Volume I, the type of agricultural practices which are predominant in the NSEZ are small-holder systems with very little acreage cropped per farmer. These are characterized with low yields because of poor farming practices adopted and the use of traditional farming implements. In addition, the farming system is largely overly-dependent on rainfall which is declining as a result of climate change. Other major factors that hinder the productivity and income earning capacity in the agriculture sector have been thoroughly discussed in Volume I.

Transformation of the economy (agricultural sector) would require development of scientific and efficient farming systems that makes utilization of modern irrigation methods which uses both surface and underground water systems in the ecological zone. Going beyond the common irrigation methods, usage of drip-irrigation which conserves much water as well as other novel irrigation and water conservation methods for farming should be introduced in the NSEZ. The development of large and efficient water reservoirs in addition to usage of underground water systems should provide enough water for commercial farming purposes in the ecological zone.

In order to accelerate the development and modernization of the agriculture sector, the use of agro-ecological farming methods and improvement in genetic engineering to develop high-yielding crops and animal species should be rigorously pursued. Climate change resistant breeds are also expected to be developed. The utilization of modern farm implements would accelerate the process of agriculture transformation which have a direct impact on economic transformation. More Research and Development (R&D) investments would be needed to support such undertakings.

Lastly, preventing hazardous and environmentally unsustainable agriculture practices key. Practices such as slash and burn methods, general bush burning which have adverse environmental effects in terms of vegetation destruction, air pollution as well as annihilation of soil organisms which are meant to improve fertility of the soil should be discouraged through massive public education and awareness creation programmes. Effective and alternative agriculture methods other than what is currently being practiced should be introduced into the ecological zone with emphasis on environmental sustainability and functionality within the NSEZ's context.

2. Development and expansion of existing (and introduction of new) high income earning crops in the NSEZ

Cashew, Shea-nut, cotton and soya bean are some crops with high income earning capacity grown in the ecological zone but form a small percentage of crops cultivated. For instance, Shea tree mostly grows in the wild with no intensive cultivation though its commercial value is almost inestimable. The potential gains ranging from oil production for cooking, soap making, cosmetics manufacturing and its massive usage in the pharmaceutical industry remains untapped. Cotton which was produced on massive commercial scale in the Upper West and parts of the Upper East regions have now taken a huge plunge in production. All these have to be critically analyzed to determine the factors militating against their growth and the way forward.

In addition, the introduction of fast-maturing crops and other high income earning leguminous crops with nitrogen fixating capabilities are alternatives that can generate large amounts of revenue to farmers as well as improve the soil fertility level. The cultivation of butter nut squash, cashew and other citrus plants which are of high national and global demand can be expanded to yield more economic returns.

3. Provision of key infrastructure to support agriculture transformation.

In order to achieve agricultural transformation, there is a critical need to provide infrastructure in the form of reliable energy supply to support irrigation systems and functional road networks to link farming areas to market centers. These proposals albeit not entirely new remains undone though it has been a major source of discussion. To ensure the needed transformation and competitiveness in the agriculture sector, government needs to invest massively in these above mentioned sectors.

Investments in irrigation facilities over the years have proven to be somewhat ineffective as they no longer hold enough water to be supplied to farms. Investments in massive or medium scale irrigation projects that are backed by reliable and cheap energy systems are needed to encourage all-year round farming in the ecological zone. The adoption of efficient water management systems, construction of large water receptacles and dams to store water when in abundance are necessary factors

for effective agriculture transformation particularly in an era where rainfall volumes are declining consistently as a result of the adverse impact of climate change.

Moreover, functional transportation networks and better feeder roads that are designed to ensure that they are all-year round motorable are needed. Besides, an efficient water transport system needs to be developed in the south-eastern part of the ecological zone. The post-harvest losses that are recorded year- in-year-out can be avoided when these efficient transportation networks are available. It is only when these infrastructure are available that private sector would be willing to input their private resources. Without that, agriculture transformation would only remain “a lip service” and an unattainable goal by the end of the plan period.

4. **Development of the livestock Industry**

The institutionalization of a strong data management system on livestock production in the NSEZ is needed. As a major zone for livestock production, the unavailability of basic data at the district level on the quantity of various types of livestock produced offers no grounds for trend analysis. Data collection and collation at the district level on the various types of livestock produced and the challenges faced in the industry is much needed to engender the development of the sector.

More research work into the development of livestock species that mature quite rapidly and produce resistant species would save farmers from time losses and lower expenditure in rearing livestock. Established government agencies and departments as well as private institutions and universities that do research in the production and management of livestock should be coordinated to contribute to the development of the livestock industry.

5. **Develop the Industry and Services sectors**

Despite the complexities and difficulties in achieving economic transformation of a predominantly agrarian economy, the economic analysis shows that, a number of industrial potentials of the ecological zone remain undeveloped. These can be developed to contribute to the economic transformation agenda apart from the agri-business agenda. The strategies towards the transformation include:

- a) **Development of the weak mining sector** – There are lots of mineral deposits in the ecological zone ranging from gold, diamond, manganese, iron ore, lime stone among others. Most of these minerals are not exploited and the ones that are mined are done on small scale and on illegal basis which yield very little economic returns to the ecological zone. The iron ore deposits at Shieni for instance is one of the finest in Africa. Estimates show that it can be mined for the next hundred years and beyond. A detailed plan for the mining of iron ore alone can contribute rapidly to economic diversification by developing a major alloy manufacturing zone in the area. This will however require investments in energy to be able to undertake the mining as well as the manufacturing process. Beside the alloy manufacturing from iron ore, all the other minerals can be properly planned for exploitation to contribute employment generation for residents in the ecological region. In the long

term, value addition should be the target to prevent the zone from becoming a commodity dependent economy.

- b) **Develop the tourism sector** - The largest share of ecological parks of the nation (national parks) falls within the NSEZ, yet these remain very remote and are not properly advertised and managed to attract both local and foreign tourists. In addition to that, accommodation facilities and leisure support services that go hand in hand with tourism is almost non-existing, discouraging tourist from visiting these sites. A comprehensive plan to develop and boost the tourism sector via developing specific tourist sites would help transform the sector in the zone. Beside these, government has to develop a good transportation system that connects all the tourist sites to major road networks to ease mobility to and from these sites.

- c) **Develop effective educational and technical training systems to provide decent jobs** – For the achievement of a transformed economy, effective educational training as well as technical skills development programmes would have to be instituted to equip the upcoming youth with the requisite employable skills. Educational programmes that prevents or minimises school dropout rates at the primary, senior-higher vocational training level would provide the youth with alternative employable skills. Establishment of technical training institutes in almost all the district capitals to offer skills training from carpentry to ICT among others during long vacation periods from the Junior High School (JHS) level to Senior High School (SHS) or Vocational Training/technical schools can provide the youth with employable skills even if they do not progress to the tertiary level.

- d) **Develop the Manufacturing sector** – The development of the manufacturing sector, ranging from fish processing, textile manufacturing, smock manufacturing, agro-manufacturing/processing should be encouraged. With the necessary managerial support, incentives and investments, the relatively weak manufacturing base will be transformed into a more vibrant and productive manufacturing sector to contribute to the economic transformation and diversification agenda.

- e) **Develop special economic zones/ Industrial enclaves in the NSEZ**
The NSEZ has no single industrial enclave. All of the developed industrial enclaves are located in the southern part of the country with the most developed one located in Tema in the Greater Accra Region. The Ghana Free Zones Board provides incentives that attract most of the manufacturing firms to locate in the free zones enclaves particularly in Tema though others exist in areas like Shama and Takoradi. The incentives include adequate and reliable supply of energy, good road network, site and services schemes, tax rebates and holidays among others.

Buipe shows maximum potential for developing a strong industrial enclave. The availability of a cement manufacturing firm, shea butter processing plant, Bulk Oil Storage Transportation (BOST). The availability of a multi-million

dollar power sub-station coupled with its strategic location as a multi-modal transport hub and proposals to develop it into a major inland freight and logistics hub position Buipe to be developed into an industrial enclave with special economic zone benefits and attraction.

This will however, require serious planning efforts and a stronger managerial system for co-ordination and making sure that synergies are created through technology and knowledge sharing and the utilization of by-products as inputs for other firms. Other areas like the Tamale airport and Shieni have the potential of being developed into industrial enclaves. These possibilities should be explored to help minimize economic disparities and create a level playing field for attaining the industrialization agenda of the ecological zone and the country as a whole.

6. **Prepare rural economic plans** – With the NSEZ being largely rural, it is economically prudent to develop rural economic development plans at the district or local levels. This should focus on developing agri-business and rural economic diversification based on the potentials of the unique settings of each of the district. Focus on non-farm employment opportunities should be a strong component of the rural economic plans that are prepared for the ecological zone.

3.2 Goal 2: Spatially Efficient and Functional Settlement Network

The zone has an ecological context that is characterized by small and scattered settlement sizes with little mobility or spatial connectivity. This has resulted in social and economic challenges which hamper developmental processes via a number of ways. The objectives and strategies for attaining a spatially efficient and functional settlement network aimed at addressing socio-economic developmental challenges of the zone have been provided below.

1. **Develop well connected growth centers with population concentration and improved economic interaction with smaller towns and settlements.**
Tamale which is the leading economic growth point as well as Wa, Bolgatanga, Bawku, Kintampo and other major urban settlements should be supported with key investments to aid economic functions as well as provide for higher order services to medium and small settlements in the NSEZ. In addition, mobility in the form of transportation connectivity between these urban centres and smaller settlements should be improved to enhance the urban-rural economic interactions and build stronger synergies. This will help create the functional settlement network with efficient economic performance and interaction to contribute to improving access to education, health as well as improving economic well-being of the residents in the ecological zone.
2. **Develop efficient and reliable transportation networks that meet local and international demand levels** (Efficient just-in-time transportation network and systems).

Transportation in the NSEZ remains a major challenge considering the vastness and remote locations of settlements. Movement from small settlements to urban centres

are laborious and time-consuming. Furthermore, those in the south-eastern part of the ecological zone take days and sometimes weeks to travel from their end to other parts of the ecological zone because of the unreliable water transport systems. Transportation from the ecological zone to other parts of the country also takes lots of hours and sometimes days if air-transport is not considered. Proposals that covers the development of integrated-multi-modal transportation hubs that combines road, rail and air (and water in some areas) should be implemented to ensure transportation services are efficient and reliable. Moreover, these hubs that have been identified should be made to implement just-in-time policies to meet the needs of the landlocked countries north of the ecological zone who can depend on the inland port services to be established at Buipe. This will better integrate the NSEZ into the West African economy and possibly the larger African market.

Development of multi-modal transportation systems ranging from bicycle and motor lanes, bus rapid systems and railway networks within major settlements will help improve internal efficiency and productivity levels which have direct impact on economic and social well-being of the residents.

3. **Enhance effective spatial planning system** – One fundamental requirement for achieving spatially efficient settlement network is the planning system that generates or produces it. The new three-tier spatial planning system which is being implemented in the country provides guidance in this direction but requires planning professionals and MMDAs to be fully committed to achieving the goal of functional and efficient settlements. Investments in the form of training professionals as well as preparation of district level SDFs and local plans have to be undertaken and implemented to achieve this objective. The development of a functional database on settlement growth as well as monitoring of a myriad of other socio-economic indicators would also have to be developed and updated on annual basis to contribute to effective planning.
4. **Develop effective and functional infrastructure systems to meet current demands and future needs** – Infrastructure is the lifeline of settlements and functional economies. To achieve functional settlements, provision of adequate infrastructure in the settlements especially the most urbanized ones are needed. Infrastructure in the form of reliable energy systems and water supply systems should be fully developed to meet existing residential (domestic) and industrial demands. Tamale's water supply system is unable to meet the existing residential demand levels. Research into the ground water level and recharge rates as well as other innovative measures would have to be developed to supply potable water to its population. Also, the inadequate power supply which results in frequent power outages affect all sort of business activities from small to large scale enterprise resulting in low production and productivity levels in the ecological zone. With the estimated population for 2035, the expansion demand levels will obviously have to be catered for.

(b) Encourage Usage of alternative energy sources- SADA, the RCC and the MMDAs should institute programmes and projects that encourage real estate companies and private individuals to utilize alternative sources of energy like solar and biogas among others. Incentives in the form of property rate rebates to entities

that utilize such innovative methods of energy generation should be encouraged for further usage rather than the over-reliance on national grid. Large bio-degradable energy generation sites can also be designated in all the five sub-regions and developed in the future when waste segregation practices are implemented in the ecological zone.

5. Ensure implementation of efficient sustainable land and water management system.

(a) Participatory Land Use Planning and Functional Planning Education. One major means of efficiently managing land in the NSEZ is through spatial planning or preparing spatial plans that clearly identifies the different land uses either at the local (micro-level) or at a district/ regional scale (macro-level). Implementation however becomes a challenge largely due to the non-participatory nature of planning over the years. Planning education in the form of public awareness creation in the plan preparation process as well having plans prepared for local areas or districts displayed on billboards in communities can spark a positive activism for ensuring that plans prepared are implemented according to the land use plans. Awareness of the availability of such plans will make citizenry challenge the implementation of activities/land use plans that fall outside the ambit of the plans. This would largely contribute to ensuring that land is used in more appropriate and sustainable manner.

(b) Strengthen Community Engagement in Water Resources Management - Water resources are valuable resources that are difficult to come by in the ecological zone. Unfortunately, the farming practices along streams and river banks are polluting water bodies with chemicals. Also, practices such as cutting trees along river banks is contributing to the depletion of water resources in the zone. In addition to the adverse impact of climate change on water reduction. Efforts and strategies are therefore needed to strengthen community engagement in water resources management. Local traditional methods of water management should be encouraged in the bid to ensure communities remain committed to such objectives.

(c) Ensure sustainable utilization of ground water systems in addition to the Surface water to solve the water scarcity and prevent its future occurrence. The existing information on the underground water system clearly shows ground water abound in the NSEZ and should be tapped for both domestic (residential), agricultural and industrial uses in conjunction with the available surface water. A water use-efficient system that does not go beyond the underground recharge capacity should be instituted based on scientific monitoring by the Water Resources Commission and other agencies in the NSEZ. This should engage local people at the district level to ensure transparency in the implementation as well as providing education on the possible impact of water stress. In addition, water use- efficient policies should be mainstreamed into almost all spheres of human activities through water saving mechanisms and strategies. This is particularly essential in an ecological zone where the impact of climate change is

having adverse effect on water resources and projected to be even worse if current patterns continue.

3.3 Goal 3: Equal opportunities for all

One major challenge of development in the ecological zone is the poor access to social services mainly education, health and access to potable water. This adversely affects the economy as well as the well-being of citizens in almost every sphere of their life. As earlier mentioned, the settlement pattern contributes to making these service provision very difficult because of the low population threshold that does not meet minimum standards for service provision. The quality of service delivery or provision remains a major bottleneck for all the social services. Teacher to student ratios, doctor to patient ratios, nurse to patient ratios and the inadequacy of logistics makes it almost impossible for the delivery of quality social services to inhabitants in the NSEZ. Having regard to these challenges, a number of objectives and strategies have been developed to ensure there is equal opportunity for all in accessing these social services. These have been briefly discussed below.

3.3 (b) Improved quality and access to health and education service delivery

In order to achieve the objectives of delivering quality health and education services as well as improving access to these services, a number of strategies have been suggested below.

- (a) **Promote settlement patterns that promote ease in the provision of basic health facilities with the limited financial resources.** Encouraging population concentration or developing spatial connections via existing transportation networks and planning methods can easily leads to population concentration in settlement networks. This can contribute to make provision of health posts or CHP compounds and basic schools easy. Discouraging the mushrooming of new settlements to aid the consolidation of settlements and population concentration should be a major target.
- (b) **Use spatial analysis in aiding the siting of health facilities and basic schools.** Data on the exact location of hospitals/ health facilities and schools are lacking in the NSEZ even at the district level. Picking the exact location of health facilities (schools) and undertaking basic spatial (radius) analysis and super-imposing it on settlements with population can help determine areas that are in need of health facilities and schools. This will lead to a more just approach to developing new facilities to prevent over-concentration of such facilities one particular area.
- (c) **Ensure health facilities are provided according to the hierarchical settlement structure as proposed by the NSDF and in line with Ministry of Health Service provision plan.** When the health facilities/infrastructure ranging from teaching hospitals, regional hospitals, district hospitals, polyclinics to CHPS compounds are provided based on hierarchical structure, higher order health service could be easily be provided within regional administrative boundaries without exerting so much pressure on the existing few ones. This will enhance the delivery of quality health service to residents of the NSEZ.
- (d) **Develop systems to attract and retain educational and health service professionals.** The low level of health and educational service delivery emanates

from a multiplicity of factors. Some of these are mainly because of the poor amenities and unavailability of basic infrastructure in most settlements. Once these are properly dealt with, it will contribute to providing solution to this challenge. However, more research work needs to be undertaken to find the causalities of the resistance to accepting postings to the NSEZ by most health and education professionals. The outcome of research can be used to develop strategies to tackle the inadequacy of the health and education professionals. Besides, salary differentiation strategies are possible incentives that can encourage attraction and retention of the health and educational service professionals.

- (e) **Mainstream traditional health attendants into the general health service delivery system.** Traditional birth attendants and other traditional health practitioners do provide essential health services particularly in the NSEZ and the country as a whole. Their services have proven to be very effective and hence should be promoted via regulation and guidance to further provide services in contexts where orthodox practitioners are lacking or inadequate. Also, they can be made to work in conjunction with the accepted orthodox medical practitioners. Initiatives like herbal medicine programme that were started at KNUST and other herbal training institutes can aid in streamlining the activities of the traditional practitioners with higher policy guidelines from the Ministry of Health.
- (f) **Improve the quality of infrastructure of the health and education facilities in the ecological zone.** Most existing basic schools in the ecological zone have poor structural quality with non-existing toilet facilities, water provision challenges and in some cases no access to electricity. These have to be improved in areas having these challenges in the NSEZ to ensure facilities are of a high standard for both students and teachers. This can improve the quality of service provided to the schools. The health sector is no exception, with most of the health facilities having huge backlogs or deficits with logistics like bed for patients among a host of other challenges. Other structural qualities of the health facilities remain largely problematic in the NSEZ.
- (g) **Increase the supply of professional health workers and teachers to meet existing demands and future population needs.** Training programmes for health and educational workers in the ecological zone should be expanded to attract the youthful population. The abysmal teacher to student ratios, doctor and nurse to patient ratios can be improved to enhance quality service delivery in the NSEZ. The institutionalized systems of attracting health and educational professionals can be reviewed and improved to ensure easy access to these training institutions. The restrictions based on the programmes applicants studied should be reviewed to provide flexibility of entry once the grades of the applicants meet the new requirements that would be set based on the recommendations of the reviews.
- (h) **Develop inclusive educational systems that adequately address the problems of disability.** The issues of physical and learning disabilities are gradually emerging in the ecological zone. Programmes that target learning disabilities should be developed and implemented to make sure students with learning disabilities are not left behind the education journey. Moreover, considerations of physical disabilities

should be a major requirement in the design and permitting process for schools, community libraries among others should ensure that equal opportunities are provided for students with disabilities. This will create equal access to education irrespective of physical disabilities.

4 CHOSEN PATH/SCENARIO FOR DEVELOPMENT

With the object of achieving the vision as well as goals discussed earlier in section three, a number of development scenarios were considered based on critical analysis ranging from spatio-economic analysis, population trend analysis, employment structure analysis, infrastructure analysis among others. The scenarios included the Urban-Led Scenario, Agriculture Led Scenario and Mixed Economy with Settlement Clusters scenario¹. Based on further analysis and subjection of the scenarios through scrutiny, the mixed economy with settlement clusters was chosen as the most appropriate option for development. It is therefore discussed in detail in the section below.

4.1 Mixed Economy with Settlement Clusters

Turning around a zone that has been economically neglected for decades does not only require years of sustained massive investments but also utilizing every opportunity and potential that lies within the zone. This is what the final spatial development scenario which is the mixed economy with settlement clusters does. It explores the diverse sectoral economic potentials and opportunities in the NSEZ within the context of settlement networks. The scenario is geared towards promoting accelerated economic development whilst achieving spatial equity in the zone.

The settlement cluster/network component of the scenario which represents a shift from traditional administrative regional planning and development to one that is functional and offers greater economic competitiveness by building on economies of scale through joint planning and development of settlements within clusters. The need for promoting settlement networks is even more pronounced in the NSEZ considering the fact that the zone is sparsely populated and dominated by small size settlements which on individual basis lack the market size capacity to attract economic investment as well as the threshold to justify high level socio-physical infrastructure and amenities. Again, a zone that is about three quarters rural requires strong synergy between urban and rural settlements, a nexus that is offered by the concept of settlement networks. It can be deduced from the above that the scenario revolves around the following four main pillars.

- Exploration of diverse sectorial economic potentials and opportunities through the mixed economy approach;
- Agglomeration or economies of scale through settlement clusters;
- Equitable spatial development; and
- Synergies between settlements, both urban and rural through networks.

It is apparent at this point that the concept of settlement clusters plays a critical role in the scenario. Indeed, without exaggeration, it is the foundation of the scenario and as such it is not only imperative to throw more light on the concept but also situate it within the broader context of the approved NSDF.

¹ The details of the Urban Led Scenario and Agriculture-led scenario can be found in Volume II of the spatial development framework for the Northern Savannah Ecological Zone.

Settlement Clusters/Networks also referred to as functional regions could be defined as spatial entities comprising cities, towns and rural settlements that are within a “reasonable” distance from one another. The definition of reasonable distance is relative hence the boundaries of networks are not rigid but fuzzy. However, the underlying feature is that there ought to be some form of identifiable clustering among settlements within a network. In general, the average distance between settlements in a cluster should be shorter than that between the cluster settlements and other settlements outside the cluster. More importantly, settlements within a cluster should have strong interactions in the form of the flow of people, goods and services. The magnitude of interactions between two settlements in a network should be stronger than that between a settlement in a network and another outside the network.

Stemming from its multiple development opportunities, the concept has been adopted by several countries. In China for instance, the Asian Development Bank (ADB) from 2008 has been advocating for the concept of settlement networks. The ADB asserts that networks through the strategic linking of settlements enhance efficient provision of infrastructural facilities and services in addition to presenting innovative mechanisms of finance².

Settlement networks present enormous development potentials including: the efficient provision of infrastructure and services; larger weight to attract economic investment; larger weight for specialization; retention of labour force and indigenous population; better synergies between cities and outlying rural settlements; and room for joint development planning.

The provision of infrastructural facilities and services is more efficient in networks provided that the settlements are well interconnected transport wise hence share common facilities with a resultant effect of a reduced per unit cost of provision. In addition to sharing, networks have higher threshold to justify the provision of high level facilities and services which member settlements on individual basis would not have had access to.

Again, if settlements in a network are well connected, it presents a larger market size to attract economic investment. The transport cost of reaching customers from one end in a network to another is reduced. In similar vein, the cost of transporting labour from one point in the network to another is minimized. These serve as a huge incentive to potential investors hence boosting job creation and local economic development.

There is room for specialization in networks granted that accessibility among member settlements is enhanced. A member settlement can focus and specialize on what it does best and depend on other members for what it does inefficiently thereby strengthening interdependencies and boosting productivity.

Stemming from larger weight to attract economic investment and high level facilities, networks have higher potential to retain the labour force of member settlements which hitherto on individual settlement basis would have been lost to bigger cities. This potential benefit is much needed in the NSEZ considering the zone’s high loss of population to bigger cities in the southern part Ghana. The relevance of settlement networks in the zone can therefore not be overemphasized.

The nexus between cities, towns and outlying rural settlements is better promoted in networks provided there is a stronger connectivity among member settlements.

² City Cluster Development: Toward an Urban-Led Development Strategy for Asia; K. Choe and A. Laquian; Asian Development Bank; 2008

Since the distribution of resources is not homogenous, settlement networks present the opportunity for joint development planning which consolidates strengths and weaknesses of member settlements. Problems which surpass administrative boundaries of settlements are better solved through the joint development planning potential.

It can be understood following the above that the TCPD in the NSDF promoted the concept of settlement networks in Ghana and further identified ten areas where it can be implemented. These areas revolved around Accra, Kumasi, STMA, Cape Coast, Sunyani, Ho – Hohoe, Aflao, Tamale, Wa and the North East area. Three of these settlements network, Tamale, Wa and North East - of the areas fall within NSEZ. This framework has identified six clusters in the zone. As presented by Figure 4.1, encompass Tamale – Buipe Cluster, Bolgatanga – Bawku Cluster, Wa – Jirapa Cluster, Yendi – Gushiegu Cluster, Kintampo – Atebubu Cluster and Nkwanta – Dambai Cluster. Based on the spatio-economic analysis, specialization or development path as to what can best propel sustained socio-economic development has been proposed for each of the networks.

The Tamale – Buipe Cluster is expected to spearhead the overall development of the zone. The cluster has a huge potential of serving as a major integrated transport hub not just in the ecological zone but the entire ECOWAS sub region. Tamale, aside having the only domestic airport in the zone – which is being upgraded to international status – is a meeting point for two major proposed railway lines; the central line from Tema to Burkina Faso and the mid line running through Yendi to the northern parts of Togo. Again, the main central national trunk road connecting Tema to Ouagadougou runs through Tamale and Buipe. In addition to the international upgrading of the Tamale airport, rail and bus terminals can be added to present travellers with multi modal options by way of air, rail and road. The inland port at Buipe can be further developed to add the water transport option, reinforcing the transport strength of the cluster.

The development of international transport hub linked with mechanization of agricultural potentials in the zone could present the cluster the opportunity of adding value to agricultural products for export. The cluster can attract investments in the area of processing industries. Again, the inland port at Buipe together with cement production and shea-nut processing plants poses a foundation for further manufacturing activities. Considering the large expanse of land between Buipe and Tamale, manufacturing oriented policies such as free zones or industrial enclaves – as found in Tema – can be promoted in the cluster. Buipe should be the starting point for the development of the industrial enclave/park because of organic growth (agglomeration) of manufacturing firms coupled with its strategic location regarding the multi-modal transport potentials it possesses.

The development of agro - processing industry, manufacturing enclave and international transport hub tied with population growth in the cluster presents the platform for building Finance, Insurance and Real Estate (FIRE) industry. Further details regarding the spatial coverage, demographics and constituents of the network have been examined under subsequent sections.

Wa – Jirapa Cluster is home to a major branch of a tertiary institution, University of Development Studies (UDS) which since its inception has significantly contributed to the economic growth of the Upper West regional capital. The growth potential the university presents can further be enhanced by way of developing the network as a centre for educational excellence in the zone and the sub region. Stemming from the cluster's cereal production potential – as revealed through the agricultural analysis – and huge endowment in mineral resources such as manganese, agriculture and mining research institutions can be developed around these potentials. The development of additional research institutes will

not only reinforce the cluster's strength in education but also provide the knowledge, skill and technology for the subsequent development of sustainable mining and agri-business industry. The tourism industry which has a long job creation chain can also be developed to strengthen the cluster's functionality.

Bolgatanga- Bawku Cluster has potential in the mass production of vegetables, and holds exclusive comparative advantage in potatoes production which can further be developed into economic competitiveness. Livestock rearing especially, cattle are well noticeable in the area. When mechanised, the cluster can be the leading exporter of potatoes not only in the NSEZ but in Ghana and beyond.

The cluster is also home to two defunct industrial plants, Zuarungu and Pualugu which used to process meat and tomatoes respectively. The large scale production of vegetables and cattle coupled with revitalization of defunct plants as well as the establishment of additional processing industries can better position the cluster economically.

Also there are lots of tourist attraction sites within and near the cluster which can be properly developed to create a vibrant tourism industry. There are lots of clay deposits which can be used to develop a strong ceramic industry. Again, there is abundant gold and manganese deposits holding the potential for manufacturing sector development via value addition processes.

Yendi Gushiegu Cluster is endowed with huge deposit of iron ore at Shieni which according to experts can be mined for the next century. The iron ore is one of the finest grades on the whole of the African continent. This presents the cluster the opportunity of producing and exporting steel on large scale (thus developing a strong metallurgical industry). The strategic development of steel manufacturing industry can build the economic competitiveness of the cluster in the ecological zone and beyond. In addition, the cluster has agricultural potential in form of production of rice, soybean and other cereals which can be mechanised. The mechanization which will require less labour but more capital intensive mechanisms is likely to release more hands for other activities on the value chain in the form of processing, packaging, transportation and marketing products.

Nkwanta- Dambai Cluster is one of the leading areas in the zone and Ghana at large that combine the production of cereals, grains and tubers. The agriculture potential of the cluster is so imposing that it cannot be overlooked. In addition to the mass production of food crops, aqua-culture and fishing are pronounced. Mechanised agricultural production, processing and exportation can therefore stimulate the development of the cluster's economy. For instance, development of fish processing and canning industry for export can create a lot of job opportunities. There is also the need for research into the introduction of crop varieties which can boost the economic prospects of the cluster. It also has a number of islands and hosts the Kyabobo national park presenting strong basis for tourism development.

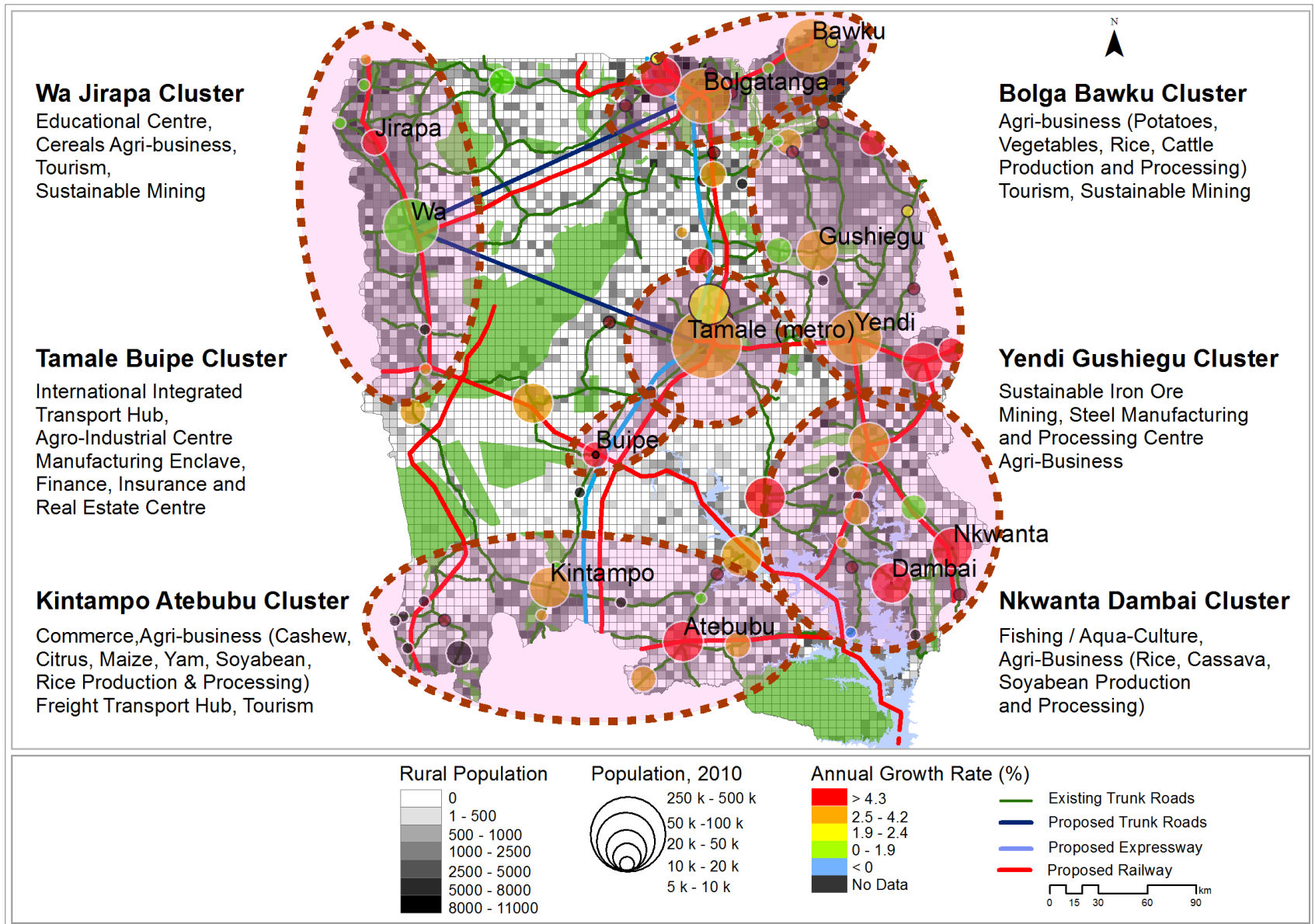
Kintampo-Atebubu Cluster has tourism, transport, commercial and agricultural potentials which can be enhanced. The availability of Kintampo waterfalls and other tourist attractions presents the cluster the potential in exploiting the tourism industry. Massive investment in the tourism industry in the form of upgrading of tourist sites; improvement in accessibility to the sites; and development of accommodation and hospitality sector could situate the cluster on high economic pedestal.

Again, informally, Kintampo has been serving as breaking point for freight transport of the vehicle that operate between Southern Ghana and neighbouring countries to the north – Burkina Faso, Mali and Niger. This has over the years stimulated some form of commercial vibrancy in the town. Further development and formalization of this function can create more

jobs in the local economy. Development of a multipurpose large cargo park is one of the strategies that can be considered in this direction.

The dominant agricultural potentials of the cluster can hardly be side-lined. The cluster is one of the few areas in the zone where cash crops such as citrus and cashew are produced. The relocation of cashew processing plants from Ghana to Ivory Coast as a result of the latter's decision to ban exportation of raw materials to the former speaks volumes of the huge untapped potential in cashew production. The mechanization of cashew production, processing and export could serve as a major propeller of the cluster's economy.

Figure 4.1: Mixed Economy with Settlement Clusters



4.1.1 Detailed Population Perspectives and Dynamics in the Clusters

This section provides detailed discussion of the population growth dynamics and expected population by the end of the planning period in the various clusters. The major towns and districts that are covered by the clusters are also discussed. The detailed map of the clusters present a better perspective of proposed major infrastructure in the form of road and railway networks.

Tamale – Buipe Cluster

As pointed out earlier, the NSDF identified an urban network which revolved around Tamale extending over land area of about 4,100 km² covering two districts in full and eight in part. Based on a much detailed spatial analysis this framework has extended the coverage area of the Tamale cluster to encapsulate Buipe as shown by Figure 4.1. The Tamale Buipe Cluster (TBC) spans over a larger area about 9300 km² covering: two districts, Tamale metro and Sagnerigu in full and eleven others in parts which are Savelugu Nanton, West Gonja, Gonja Central, East Gonja, North Gonja, Tolon, Kumbungu, Karaga, Gushiegu, Kintampo North and Mion.

TBC is one of the populous clusters in the zone. The cluster significantly increased its population from 600,000 in 2000 to 730,000 in 2010 and could reach a million by 2035. It is the second densest cluster with about 80 p/km², density that is substantially higher than the zone's average of 40 p/km². From the population projection, the density could rise to about 110 p/km² by 2035. The cluster boasts of the highest urbanization level in the zone. Over the last intercensal decade, the cluster increased its urbanization level from about 40 percent to 49 percent and could further appreciate to 70 percent by 2035.

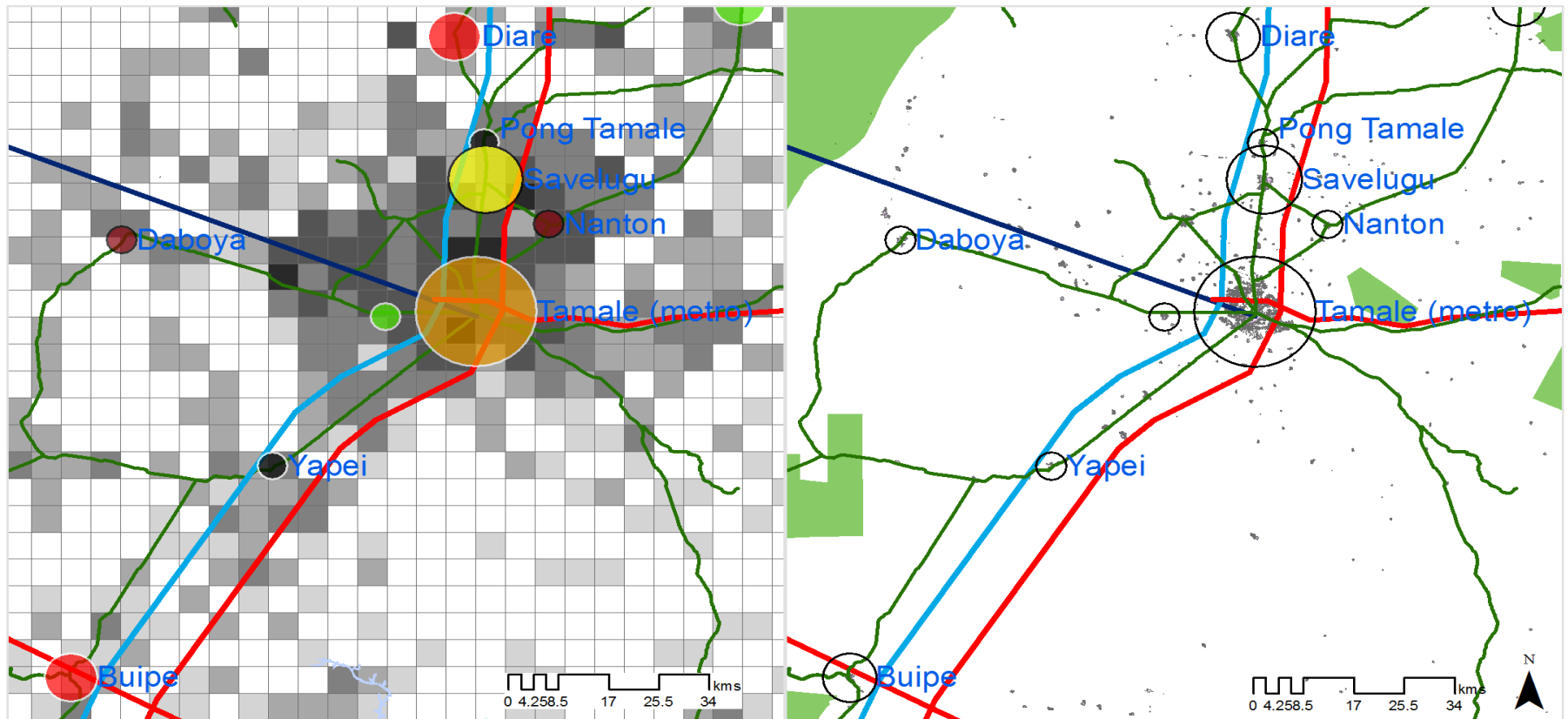
TBC's 2010 urban population of about 360,000 is spread across nine settlements, Tamale, Savelugu, Diare, Buipe, Nyankpala, Daboya, Yapei, Nanton and Pong Tamale. The population in these settlements ranges widely from a little over 5,000 in Pong Tamale to 274,000 in Tamale metro. The urban settlements are not too wide apart with distances ranging from 7 km between Savelugu and Pong Tamale to 135 km between Buipe and Diare. On the average, the settlements are about 55 km apart. Savelugu, the second largest settlement in the cluster is 24 km away from Tamale metro, the largest centre in the cluster and the entire zone. Again, Diare the third largest centre with 13,000 people is only 27 km away Savelugu. The closeness of the large urban centres is a major strength of the TBC.

TBC rural population absorbed by 709 settlements increased from around 340,000 in 2000 to 370,000 in 2010 and is projected to decline to 320,000 by 2035 due to ongoing urbanization trend. The rural settlements are concentrated around Tamale especially the north western part of the regional capital.

The cluster is a moderate growing area as it recorded annual growth rate of 2 percent which is below the ecological zone average of 2.5 percent between 2000 and 2010. The growth of TBC is largely fuelled by the urban population which grew by 3.5 percent, also below the ecological zone's urban population growth during the period. The rural population on the other hand grew below 1 percent (0.8 percent).

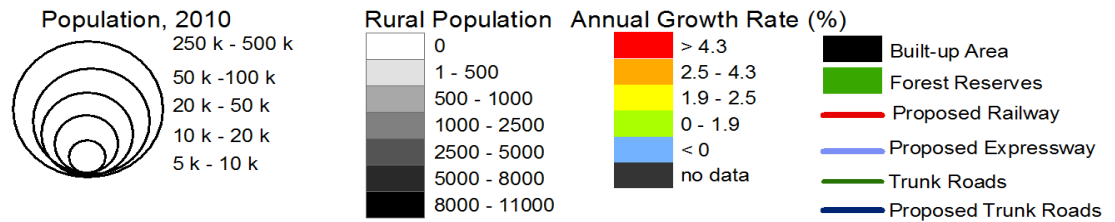
Some of the urban settlements recorded phenomenal growth. For instance, Buipe and Diare grew above 7 and 5 percent respectively during the last intercensal period. Buipe's rapid growth is because of recent economic investments and vibrancy from the manufacturing firms. The centre also has the major inland port and Bulk Oil Storage and Transport facility in the ecological zone. Tamale also grew substantially while Yapei and Pong Tamale gained urban status. No urban settlement declined during the period between 2000 and 2010.

Figure 4.2: Tamale Buipe Cluster



map 1: urban and rural settlements

map 2: built-up area, trunk roads, expressways and rail network



Bolgatanga- Bawku Cluster

Bolgatanga Bawku Cluster (BBC) is the most populous cluster in the ecological zone. In 2010, the cluster absorbed about 1.15 million people – representing a fifth of the zone’s total population – from previous 1 million in 2000 and it is projected to hold 1.6 million by 2035. In both 2000 and 2010, it was the only cluster that held at least a million people. BBC extends over total land area of about 9,900 km² covering either in full or part, 16 districts – Bolgatanga Municipal, Bawku Municipal, Bawku West, Kasena Nankana East, Kasena Nankana West, Builsa North, Builsa South, Mamprugu Moagduri, Talensi, Bongo, Garu Tempene, Nabdam, Binduri, Pusiga, Mamprusi East and West Mamprusi. In addition to being the most populous, it is the densest cluster in the entire zone. The cluster is spatially presented by figure 4.2.

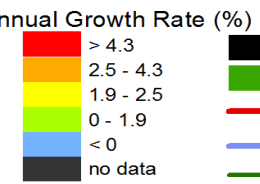
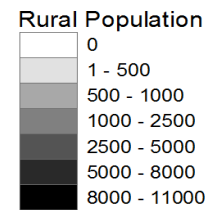
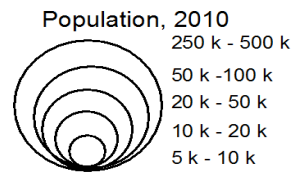
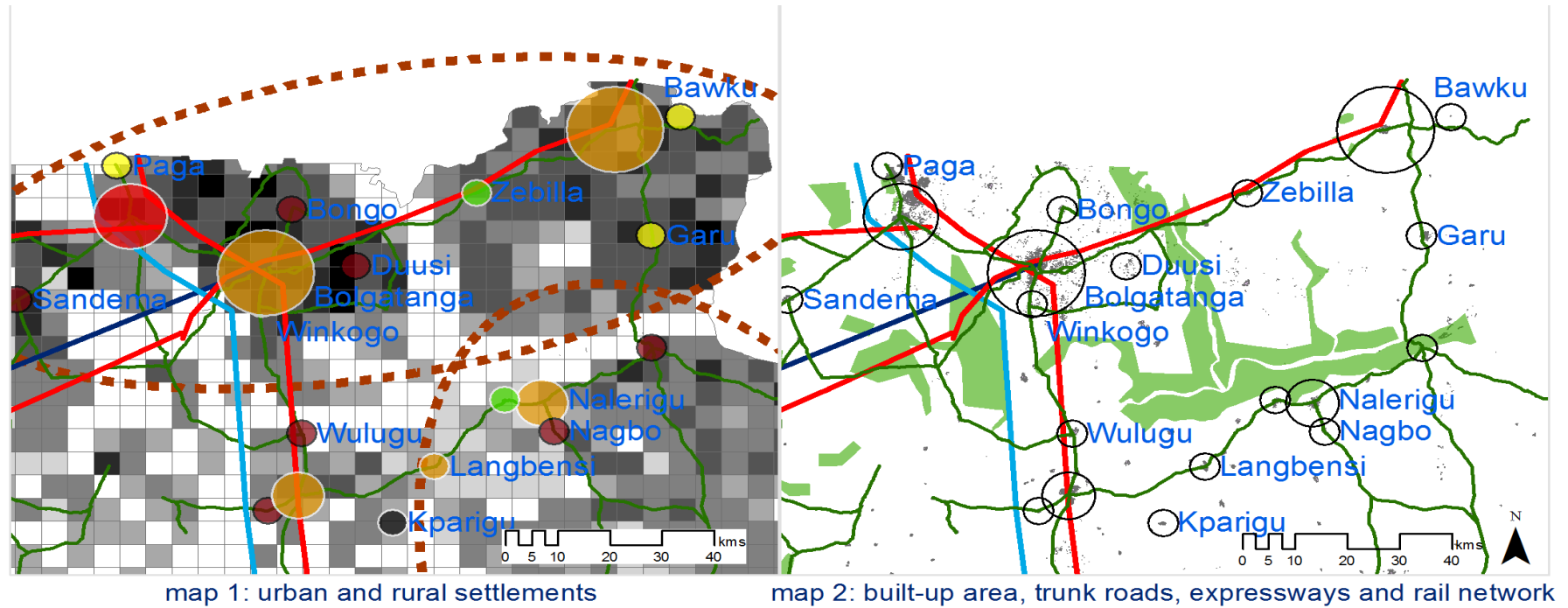
BBC is largely rural with just about a fifth of its 2010 population being urban dwellers. That notwithstanding, the urbanization level is increasing as it jumped from 18 to 22 percent between 2000 and 2010 and could reach 45 percent by 2035. The cluster’s 2010 urban population of about 258,000 was spread among 15 settlements – Bolgatanga, Bawku, Navrongo, Walewale, Paga, Pusiga, Zebilla, Wungu, Winkogo, Garu, Duusi, Kparigu, Sandema, Wulugu and Bongo – with population varying widely from 5,200 in Bongo to 67,000 in Bawku. The settlements are not too wide apart with distances ranging from 6.5 km between Walewale and Wungu and 132 km between Pusiga and Sandema. On the average, the settlements are about 60 km apart. Bawku, the largest urban centre (from 2010 population) is only about 74 km from Bolgatanga, the capital of Upper East region and the second populous centre in the cluster. Navrongo, the third largest centre is within 30 km from Bolgatanga. Much closer, Paga, the fifth urban centre is only 12 km from Navrongo. Thus, to the advantage of BBC, the major urban centres are compact which could facilitate efficient flow of people, goods and services when further explored.

BBC’s rural population absorbed by 1,630 settlements increased from about 830,000 in 2000 to 900,000 in 2010 but owing to urbanization, it is expected to fall by around 25,000 by 2035. The rural settlements are clustered around the top three urban centres.

BBC is relatively a slow growing area. Over the last intercensal period, the cluster grew by 1.3 annually compared with the ecological zone’s 2.5 percent. The urban population however, demonstrated significant growth of 3.6 percent although below the zone’s urban average of 4.3 percent. The rural population grew at 0.8 percent, a much slower pace matched with the zone’s rural average of 1.7 percent.

However, at the settlement level, some of the centres recorded outstanding growth during the decade between 2000 and 2010. Navrongo and Wungu grew above 6 and 5 percent respectively. The largest centres, Bolgatanga and Bawku also recorded substantial growth of 3 and 2.5 percent respectively. On the one hand, two settlements, Winkogo and Kparigu for the first time joined the urban class. On the other hand none of the existing urban settlements in 2000 declined in 2010.

Figure 4.3: Bolga Bawku Cluster



Wa Jirapa Cluster

Wa Jirapa Cluster (WJC) extends over about 13,600 km² land area, covering six districts – Wa Municipal, Wa West, Nadowli-Kaleo, Nandom, Lawra and Lambussie Karni – in full and seven – Jirapa, Wa East, Sissala East, Sissala West, Daffiama Bussie, Sawla Tuna Kalba and Bole – in part. In 2010, the network had about 750,000 people which is 135,000 more than what it held in 2000 and it is projected to hold an estimated 1.1 million population by 2035. With population density of 55 p/km², the WJC is the third densest cluster in the ecological zone.

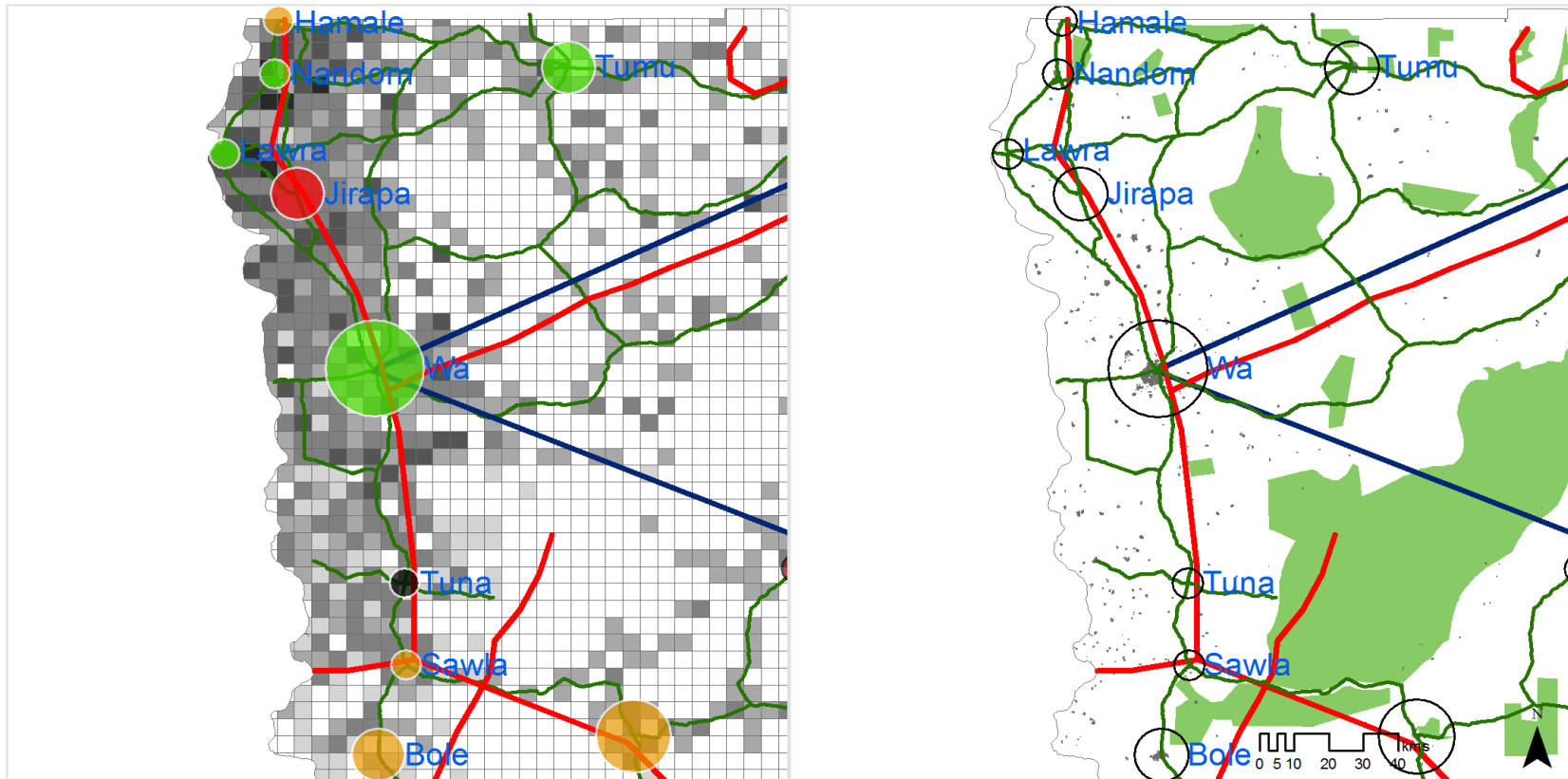
In sharp contrast to its rank in population density, the WJC was the least urbanized cluster in the zone. It was the only cluster which had less than a fifth (19 percent) of its population in 2010 being urban dwellers. In addition, the cluster's urbanization level did not increase significantly over the last intercensal period as in both years the proportion of population being urban was around 19 percent. The 2010 urban population was distributed over nine settlements – Wa, Bole, Jirapa, Tumu, Sawla, Nandom, Hamale, Lawra and Tuna – with population varying from about 6,000 in Tuna to 71,000 in Wa. The WJC relative to the TBC and BBC is not too compact. The urban centres in the cluster are significantly apart as distances between settlements range from about 16 km between Nandom and Hamale and 220 km between Hamale and Bole. On the average, the settlements are about 100 km from one another.

That notwithstanding, from figure 4.3, some of the urban centres are close neighbours. Indeed, it appears there are two sub clusters with Jirapa, Lawra, Nandom and Hamale on one end; Bole, Sawla and Tuna on the other end; and Wa tying the two together. On the average, the centres in the Bole sub cluster are within 35 km from one another and even tighter, that of Jirapa sub cluster is around 30 km. Again, Wa, the largest centre and anchor of the cluster is within 55 kilometres from Jirapa, the third largest centre with about 13,000 people. Tuna, the smallest urban centre located in the Bole sub cluster is within 65 km from Wa. Thus, though generally the urban centres appear significantly distant apart, an in-depth look suggest some level of compactness which as argued earlier could be capitalized as major a strength in building an efficient cluster.

WJC is largely (81 percent) rural. The rural population distributed over 1,240 settlements increased from about half a million in 2000 to 0.6 million in 2010 and could reach 0.88 million by 2035.

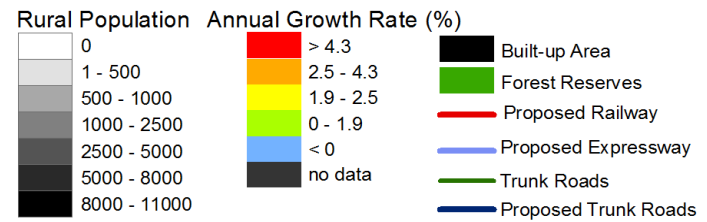
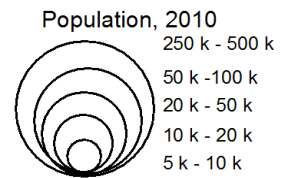
The cluster is a growing at a very slow rate. Peculiar to the cluster, the rural and urban population grew at a similar pace (around 2 percent annually) between 2000 and 2010. This reflected a total population growth of around 2 percent. Thus, in urban and total population terms, the cluster grew at a slower pace compared with the ecological zone's averages of 4.3 and 2.5 percent annual growth respectively. At the individual settlement level, Jirapa – with 4.7 percent annual growth rate – was the only settlement that grew faster than the zone's urban population. Although below the zone's urban average, Bole and Sawla recorded significant growth rates of 3.7 and 3 percent respectively during the decade. Tuna for the first time joined the urban class in 2010.

Figure 4.4: Wa-Jirapa Cluster



map 1: urban and rural settlements

map 2: built-up area, trunk roads, expressways and rail network



Yendi Gushiegu Cluster

Yendi Gushiegu Cluster (YGC), one of the largest in the zone spans over 15,000 km². The cluster covers five districts – Yendi Municipal, Gushiegu, Saboba, Chereponi and Bunkpurugu Yonyo – in full and nine – Nanumba North, Zabzugu, Karaga, Mamprusi East, West Mamprusi, Mion, Tatale, Bawku West and Garu Tempene – in part. YGC is a fairly populated area. The cluster increased its population from about 580,000 in 2000 to 820,000 in 2010 and could reach 1.5 million by 2035. Compared with TBC and BBC, YGC's population density of 54 p/km² is low.

About a quarter (26 percent) of the cluster's 2010 population lived in urban areas. The urbanization level has been increasing but at a slow pace considering that the cluster was 24 percent urban in 2000. Indeed, in absolute terms, the cluster gained about 70,000 urban dwellers between 2000 and 2010 and could have additional 380,000 people in its urban areas by 2035.

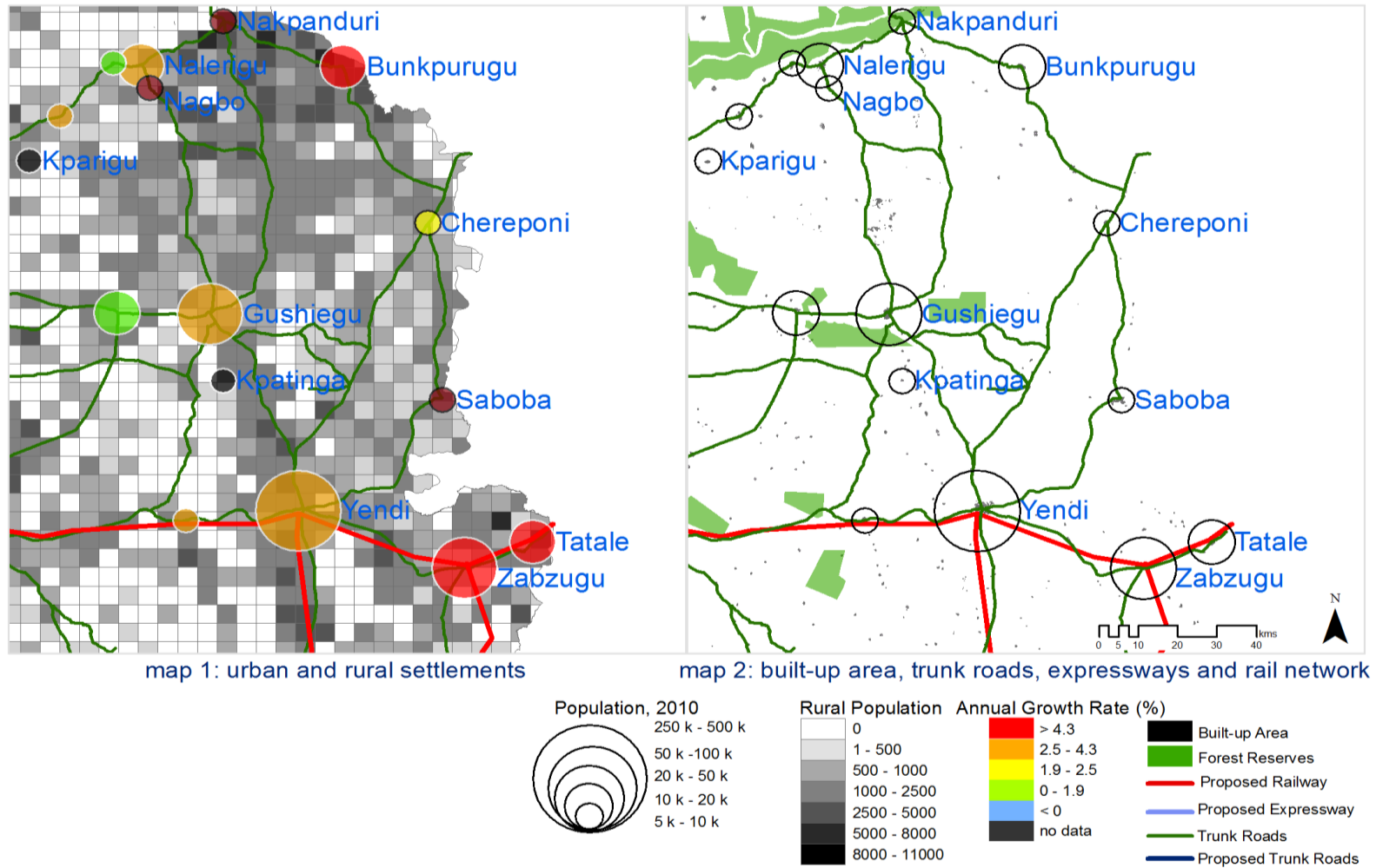
In 2010, the cluster had 16 urban settlements – Yendi, Zabzugu, Gushiegu, Karaga, Nalerigu, Tatale, Bunkpurugu, Gambaga, Langbensi, Chereponi, Sang, Kpatinga, Saboba, Nakpanduri, Nagbo and Kparigu – with population ranging from a little over 6,000 in Kparigu to 52,000 in Yendi as shown in Figure 4.4. YGC urban settlements are not too wide apart but not as compact as those in Bolgatanga Bawku Cluster. Distances between the settlements vary from 6.5 km between Nalerigu and Nagbo and 167 km between Tatale and Gambaga. On the average, the urban settlements are 80 km apart. Zabzugu, the second largest settlement with an estimated 20,000 people is about 45 km away from Yendi, the largest centre in the cluster. Gushiegu, the third largest centre is about 60 km from Yendi. Thus, similar to TBC and BBC, the top three centres in YGC are close neighbours.

The cluster is dominantly (75 percent) rural. The rural population absorbed 1,500 settlements and increased by more than 150,000 from 430,000 in 2000 to 600,000 in 2010 and could reach a million by 2035. The rural settlements are much concentrated between Gushiegu, Nalerigu and Bunkprugu.

YGC is a fast growing area. Over the last inter-censal period, the cluster grew at 3.5 percent annually, a rate that is significantly higher than the ecological zone's average of 2.5 percent. Aside the total population, the cluster is growing faster than the zone in rural terms. During the period, the rural population grew rapidly at 4.1 percent compared with the zone's 1.7 percent. Thus, the rural population growth in the cluster was more than twice faster than that of the latter. However, even though the cluster recorded significant urban growth of 3.3 percent, it was outpaced by the zone's urban rate which grew at 4.3 percent.

The growth of some of the settlements stands out. Tatale (7.2 percent), Zabzugu (6.1 percent), Bunkpurugu (5.6 percent) and Saboba (5.4 percent) recorded remarkable growth over the decade. Kparigu and Kpatinga gained urban while no urban settlement lost population.

Figure 4.5: Yendi-Gushiegu Cluster



Nkwanta Dambai Cluster

Nkwanta Dambai Cluster (NDC), the second most populous cluster in the zone spans over 16,600 km² encompassing in full, six districts – Nkwanta South, Nkwanta North, Nanumba South, Kpandai, Krachi Nchumuru and Krachi East – and eight – Krachi East, Sene West, Sene East, East Gonja, Nanumba North, Zabzugu, Mion and Tatale – in part. The cluster's population increased from around 590,000 in 2000 to 850,000 in 2010 and could hit over a million by 2035. With population density of 51 p/km², the NDC but for Kintampo Atebubu Cluster is the least dense cluster in the zone.

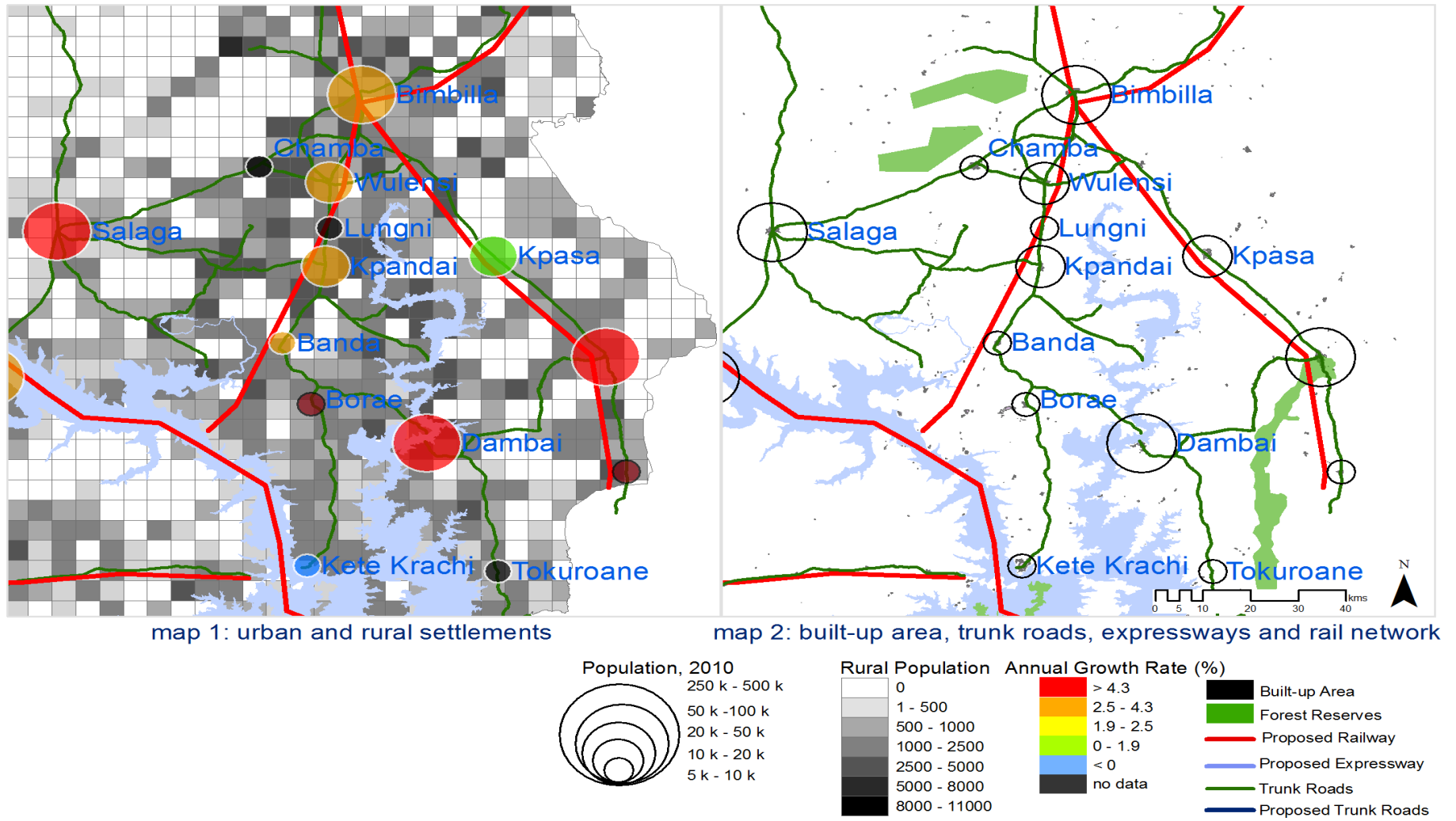
The cluster's urbanization level in 2010 was slightly below a quarter (23 percent) making it the fourth urbanized cluster. The urban population increased from a little over 120,000 in 2000 to about 200,000 in 2010 and this could reach 570,000 by 2035. The rise in the urban population during the decade occasioned a corresponding increase in urbanization level from 20 to 23 percent. NDC's urban population in 2010 was absorbed by 14 settlements – Bimbilla, Dambai, Salaga, Nkwanta, Kpasa, Kpandai, Wulensi, Banda, Kete Krachi, Chamba, Brewianiase, lungni, Tokuroane and Borae – with population ranging from about 5,200 in Borae to 31,000 in Bimbilla. Aside Bimbilla, there are four major centres, Dambai, Nkwanta, Salaga, and Kpasa each with population hovering between 20,000 and 25,000.

The urban settlements are relatively close to each other. Distances between the settlements vary from 10 km between Kpandai and Lungni to 135 km between Salaga and Brewianiase. Salaga, the third largest urban centre with population of 25,000 is within 75 km from Bimbilla, the largest centre. Nkwanta, the fourth largest centre with about 23,000 people is within 45 km from Dambai, the second largest with population of 27,000. Wulensi, a major centre with about 11,000 people is only 22 km away Bimbilla and Kpandai – another major town – is 40 km from Kpassa, a key centre with about 18,000 people. Banda with about 10,000 people is within 40 km from Dambai and 20 km from Kpandai. Borae, the smallest urban centre is 15 km away Banda and within 30 km from Dambai. Generally, similar to many of the clusters, the urban settlements in the NDC are not too wide apart presenting the cluster the opportunity for efficient flow of people, goods and services.

More than three quarters (77 percent) of the cluster's population is rural. The rural population absorbed 1,130 appreciated from 470,000 in 2000 to 650,000 in 2010 and could further increase to a million by 2035 which will make it the most populous cluster with regard to rural population.

The NDC is the fast growing area in both urban and rural terms. Over the last intercensal period, the rural population grew rapidly (at annual rate of 5.1 percent) than the Zone's urban average. Similarly, the rural population in the cluster grew faster than that of the zone by recording significantly high growth rate of 3.7 percent the highest in the zone. In general, the cluster is the fastest growing area in the ecological zone. Even more stunning, is the growth of some of the individual settlements. Nkwanta emerged as the fastest growing settlement in the cluster as it recorded outstanding annual growth rate of 7.3 percent. Following suit, Dambai grew at 6.9 percent during the period. Salaga and Bimbilla also grew above 4 percent. Three settlements, Chamba, Tokuroane and Lungni gained urban status. On the flip side, the NDC is the only cluster with an urban settlement which declined over the decade. Kete Krachi lost 319 people during the period.

Figure 4.6: Nkwanta Dambai Cluster



Kintampo-Atebubu Cluster

The KAC cluster is the least populous cluster yet it is the second largest cluster covering a land area of 17,659 Km². The KAC Cluster covers five districts in full – Kintampo North, Kintampo South, Pru, Atebubu, Tain, Banda and three districts in part- Bole, Sene West and Gonja Central. The cluster's population increased from 452,392 in 2000 to 611,677 by the end of 2010 and it is estimated to be more than a million (1,109,893) by the close of 2035. Having a population density of 35p/Km² the KAC remains the least dense cluster in the entire ecological zone.

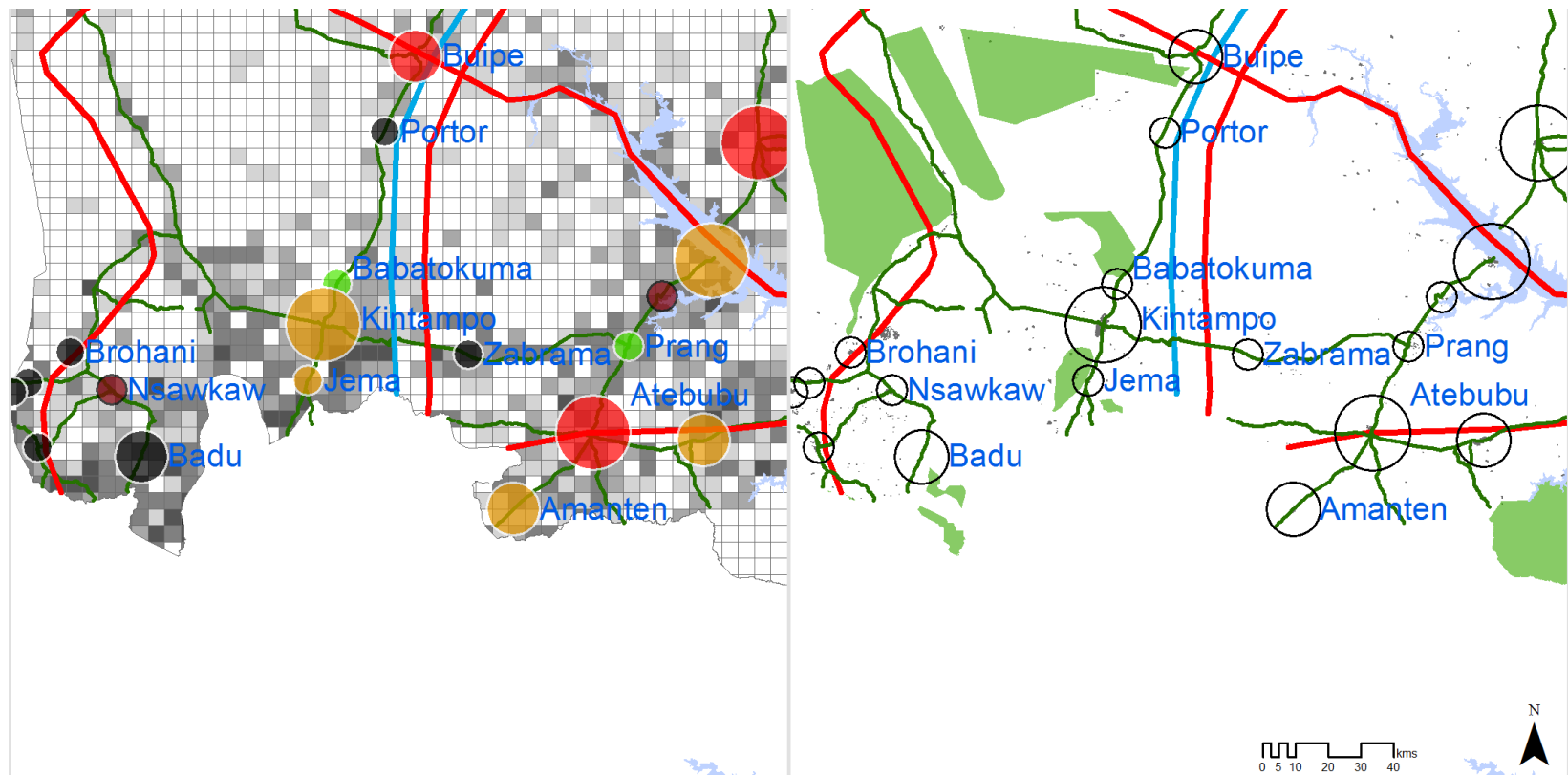
The cluster's urbanization level in 2010 was around 34 percent making it the second most urbanized cluster. The urban population increased from 109,989 in 2000 to 209,242 in 2010 and could possibly reach 647,812. The increase in urban population resulted in a growth in urbanization percentage level from 24 to 34 percent. KAC's urban population growth experienced in 2010 occurred in 19 settlements. Some of these settlements include Kintampo, Atebubu, Amentim, Preng, Jema, Nsawkaw, Brohani, Zabrama, Babatokuma among others. The largest urban centres in the cluster consists of Kintampo, Atebubu and Amenten which have population sizes ranging from 15,000 to 50,000 and over.

The urban settlements are relatively close and they are mainly in the southern part of the Cluster. The distances between urban centres vary from about 10 km to about 180km. The distance between Buipei and Kintampo is about 110 km. Distance from Atebubu to Kintampo is about 80 km. Quite similar to many of the clusters, the urban settlements in the KAC are to not too wide apart presenting the cluster the opportunity for efficient flow of people, goods and services.

About two-thirds of the cluster's population is rural. KAC's rural population increased from 342,403 in 2000 to 402,435 in 2010 and could further grow to hit 462,081 by the end of 2035 making it the second most urbanized cluster only after the Tamale cluster.

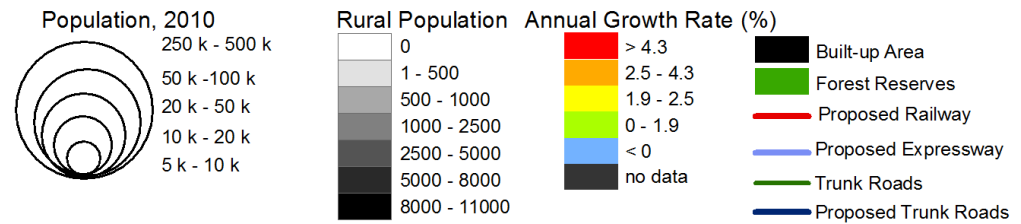
The KAC is fast growing in both urban and rural terms. Between 2000 and 2010, the cluster's urban population grew at 6.6 percent making it the fastest urbanizing cluster among all the clusters found in the ecological zone. The cluster's rural growth rate for the same inter-censal period was 1.6 which is comparatively lower than its urban growth rate but ranked third among the six clusters. Some of the settlements that are growing faster than the zone's urban average growth rate are Atebubu and Nsawkaw. Kintampo which is one of the largest urban centres and economically vibrant areas is growing quite rapidly around four percent. Other smaller urban centres which are growing just within the range of growth rate as Kintampo include Jema and Amenten. Rural settlement that are growing based on the cell grids shown in black are mostly concentrated around Kintampo, Nsawkaw, Badu and between Atebubu and Preng creating opportunities for stronger urban rural synergies to be developed.

Figure 4.7: Kintampo-Atebubu Cluster



map 1: urban and rural settlements

map 2: built-up area, trunk roads, expressways and rail network



Source: TCPD 2015 based on Population and Housing Census, 2010

5 PRIORITIZATION AND PHASING OF KEY PROJECTS

To achieve the afore-stated vision and goals of economic transformation and diversification for the Northern Savannah Ecological Zone, the spatial development framework for the NSEZ proposes a number of strategic projects ranging from road networks, inland port, water transport systems, energy generation, irrigation and water supply projects among others which will turn around the economy. These projects will have to be undertaken in the short to medium term to kick-start the economic transformation and development that is envisaged for the Zone. Some of the projects identified are in line with the NSDF. The final part of this sections briefly discusses the phasing of the projects for the various thematic areas.

5.1 Prioritized Sectors for Investment/Implementation

For rapid economic transformation and development that equalizes development levels in the southern parts of Ghana require investments over a number of years. Most often than not, prioritization of investments are not undertaken leading to minimal impacts made in the lives of people when projects come to an end. Issues of poor coordination and continuity of projects also become major challenges.

Based on these observed precedents and for prudent maximization of the limited resources, multiple decision making criteria was used to prioritize the various sectors and the results are shown in Table 5.1.

Table 5.1: Prioritized Sectors for Investment in the NSEZ

| Sector | Most critical for economic transformation and trigger achievement of other sectorial goals | Likely to improve livelihoods of populace now (within shortest possible time) | Improve economic competitiveness and linkage to Ghanaian economy and the West African Economy | Likely to improve economic status of the populace | Total |
|-----------------------|--|---|---|---|-------|
| Transport | 12 | 6 | 3 | 6 | 27 |
| Energy | 20 | 6 | 4 | 4 | 34 |
| Agriculture | 12 | 12 | 2 | 6 | 32 |
| Education & Health | 8 | 6 | 1 | 4 | 19 |
| Industry and services | 16 | 6 | 3 | 6 | 31 |
| Environment | 4 | 6 | 2 | 4 | 16 |

Source: Town and Country Planning Department, 2015

Based on the total score for the thematic areas presented in the table 5.1, the energy sector stood out as the most important sector needing immediate investment to help the attainment of the set vision and goals for the NSEZ. This is because it is the most critical for economic transformation and also trigger achievement of other sectorial goals. For instance, efficient water supply systems for irrigation (either by drip or other methods) depend solely on energy to pump water from either ground or surface. Water for the urbanized residential usage and industrial needs all depend on efficient and reliable energy infrastructure to aid their supply. In addition, modernized and productive agro-manufacturing industry for the NSEZ will depend on energy for almost all activities. To develop the mining industry (iron ore mining at

Sheini) and developing the metallurgical industry would require substantial energy supply for operation. In short, the industrialization agenda hinges predominately on energy availability³.

The agriculture sector comes second for investments followed by the industrial and services sectors and education. The fifth and sixth ranked sectors for investments are transport and environment sectors respectively.

5.2 Important projects for the NSEZ

Notwithstanding the identification of the prioritized sectors for investments, it is important to note that projects within these sectors can be undertaken individually and concurrently. To achieve rapid transformation, implementation of “turn-key projects” or “trigger projects” which can speed up and also serve as adequate foundations for the implementation of other sectoral projects and activities have to be undertaken first. Some of these very important projects that need to be implemented in the short term have been concisely presented below.

5.2.1 Development of the Buipe Inland Port

The development of Buipe inland port will be a major game changer in the economic fortunes of the NSEZ. The development of the inland port will ease the transportation of goods from Tema port to Buipe reducing cost as well as travelling time for the landlocked countries who have to travel all the way to Tema to transport their goods. This will give Ghana the competitive edge in the transport and logistics industry over Togo and Ivory Coast. In addition, substantial amount of jobs will be created in the ecological zone either directly or indirectly. The design of the port should however take into consideration water level variation based on various projections as a result of the likely impact of climate change and proposed construction of dams upstream of the Volta Lake.

5.2.2 Development of Industrial hub/ Special Economic Zones

There is the need to develop industrial enclaves in the NSEZ to achieve the object of industrialization which is envisaged for the Zone. One area ripe for the development of such an industrial enclave is Buipe. Buipe is currently host to a major local cement manufacturing firm, shea butter processing firm, major BOST station and houses a multi-million dollar power sub-station. In addition to these, its location as a multimodal transportation hub coupled with other unexploited underground resources all present good grounds for locating an industrial enclave in Buipe. The industrial enclave will however need special economic incentives to attract both local and foreign firms. Potential of developing strong agro-manufacturing firms, pharmaceutical firms, cosmetics firms etc. are all viable economic options.

The industrial enclave will need a special management board to ensure the benefits of agglomeration economies as well as knowledge and technology transfers and by-products firms are efficiently used by other firms.

5.2.3 Development of the eastern corridor roads

The South-eastern section of the NSEZ remains one of the most productive agro-production areas of the Zone yet the road network in the area is in deplorable state. This limits the flow of goods and passengers leading to huge economic losses and poor economic interaction with other settlements. The eastern corridor linkages like Bimbila-Tamale direct link, Tatale

³ Encouraging residential facilities to use solar and biogas can however release the stress on the national grid. The energy required for the industrial, agricultural purposes etc. can therefore be used for the projects identified in the ecological zone.

to Tamale are urgent connections that have to be constructed within the shortest possible time. In addition, the Bimbila-Dambai-Nkwanta connection has to be developed.

5.2.4 Construction of the Juale Hydro-Power Dam

There is the need to commence the construction of small and medium hydro-power dams to aid the achievement of industrialization and economic diversification goal. One of such key sites is the Juale site that has the potential to generate about 90 MW of energy. The site is quite close to the Sheini Iron ore deposit in which is estimated to have to potential to be mined for the next 100 years. It also remains one of the finest of ores on the African continent. The development of this hydro power plant will provide affordable power for the proposed industrial activities. In addition to that, it will boost energy reliability levels for firms wishing to come to set up in the ecological zone.

5.2.5 Development of reliable water transport systems

There are number of settlements along the Volta Lake that depend on water transport with huge passenger and freight volumes. The unreliable nature of existing ferries and canoe services and large number of accidents recorded annually hampers the transportation for economic activities. The construction of better landing sites and provision of ferries would have to be undertaken to ease heavy traffic at sites like Yeji-Makango (estimated 850,000 passengers by 2018), Ketekrachi-Kojokrom (630,000 passengers by 2018), Dambai-Dodoikope (630,000 passengers by 2018), Asuoso-Begyemse (200,000 passengers by 2018). Furthermore, the services around the Digya National Park should be developed to help the island communities in these areas. The development of these projects will solve the water transport challenges faced by the residents and also improve the economic activities in these areas.

5.2.6 Improvement in Road Network in the Wa-Bolgatanga Cluster

There is the need to develop a direct trunk road to link Bolgatanga to Wa. This will reduce the long travelling hours and increase the rate of economic interaction between these major urban centres. Another major linkage that needs to be constructed is the Tamale-Wa direct trunk road. The Ffulso-Sawla-Kalba-Tamale link seems to be a good linkage but it takes too long a time to commute between Tamale and Wa. In the medium to long term, the Tamale-Wa link will have to be constructed to speed up economic interaction.

5.2.6 Development of key Irrigation Systems

Based on the significant level of groundwater in the zone coupled with recent ground water studies, efficient and reliable irrigation systems should be developed to help encourage all year round agriculture in the NSEZ. Also, key identified irrigation projects in the zone mainly in the Upper West and Upper East Regions should be developed as these areas have the most limited access to water.

5.2.7 Implementation of the Green Infrastructure Network

The proposed Green Infrastructure Network for the ecological zone which covers national park, forest reserves and water protection buffers among others will have to be implemented in the NSEZ. This will help green the NSEZ and provide major environmental benefits amidst the challenges brought forth by climate change and other environmental challenges. The implementation will have to involve Forestry Commission, EPA, MMDAs and the local communities.

5.3 Phasing of the Sectoral Projects

The phasing of the sectoral projects considers proposed projects by the government particularly from the NIP, the NSDF and also projects proposed by the TCPD planning team in consultation with all the relevant stakeholders. The critical issue here is for the NSEZ recommended projects to be in harmony with both the NIP and NSDF which provide the current government policy directions on future investment. These projects demand serious priority consideration and resolute decision making at SADA and regional administration levels. However, the planning team and stakeholders have considered the projects based on the analysis the criteria shown in table 5.1 considered earlier in this volume. The duration for the NSEZ SDF implementation spans through a period of 20 years, starting from 2016 to 2035. This has been divided into four phases of five years each. The details of the implementation plan are provided in the last section of Volume II of SDF for the NSEZ.