



Bindura Municipality

Bindura Municipality Master Plan

Report Of Study

Reference:

| 7 October 2024

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Job number 4673

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Chapter 1 : Background, Historical and Macro – Economic Context. And Critical Planning Issues in Bindura Town

1.1 Introduction and Background Information

A Master Plan is an overarching planning document and spatial layout which is used to structure land use and development in both urban and rural spaces. In essence; it represents a land use and infrastructure plan that sets forth local goals, objectives and policies for community development and/or redevelopment over a specific long-term period. When complete and approved by the relevant authorities, a Master Plan becomes a legally binding instrument that guides development in a defined area. Core issues addressed in Master Plans often include, but are not limited to; physical improvements, public space needs, environmental concerns, infrastructure needs; business opportunities, residential concerns, commercial /retail issues, business improvement needs and access and connection needs.

A landmark event in Zimbabwe’s development trajectory has been the launch of the Presidential Call to Action. Under the initiative; all Local Planning Authorities in Zimbabwe have been directed to; among other things, prepare Master Plans in their respective jurisdictions by the 30th June 2024. The Ministry of Local Government and Public Works, in line with the Presidential Call to Action has held several conscientisation workshops with planning and related professionals both in the public and private sectors to prepare them for this important and defining assignment. The Ministry (through the Department of Spatial Planning and Development ((DSPD)) has sought the assistance of private sector planners to lead the studies and allocated them to selected rural district and urban councils for this purpose. It has also issued a directive in letter dated 14th March 2024 on matters related to study boundaries for master plan preparation under this exercise, among other issues. It is in this context that Dr Nelson Marongwe and Arup Zimbabwe, thereafter, referred to as the Consulting Team, were awarded the assignment for the review of the Bindura Municipality Master Plan. This Report constitutes the Study Report by the Consulting Team.

Guided by the Presidential Call to Action, the assignment sought to prepare the Bindura Municipality Master Plan, with the 30th of June as the target date. This means that this is a fast-tracked plan preparation initiative, which does not compromise the legal requirements for plan preparation as provided for in Part IV of the Regional, Town and Country Planning (RTCP) Act Chapter 29:12, Revised Edition 1996 and the associated Master and Local Plans Regulation No 248 of 1977. In line with provisions of the RTCP Act, the exercise is multidisciplinary; and hence the involvement of

other professions to handle various thematic issues required in the Master Plan preparation. The underlying; critical assumption being that the end product has to articulate and address developmental issues in Bindura Municipality in this case and will act as a framework for directing development. To achieve this, the plan preparation process was both thorough and inclusive.

1.2 Location of Bindura Town

Bindura Town is the provincial capital of Mashonaland Central Province. It is located about 89 km to the north-east of Harare. Figures 1.1 shows the location of Bindura Town in the national context, while Figures 1.2-1.3 depict the provincial context. The town is served by the A11 Harare- Bindura Highway, which links to Mount Darwin, some 69 km away from Bindura Town. The Road branches to the Mukumbura Border Post (via Rushinga); acting as the gateway to Tete Province in Mozambique. The distance between Bindura to Mukumbura is 102 Km by road. Thus; the Mukumbura Border Control (Zimbabwe) is between Zimbabwe and Mozambique. On the Mozambican side there is the Mecumbira Border Post; with the border on each side separated by the Rio Mukumbura River. Bindura Town is connected to Shamva Town which is located 27km away, via the Shamva Road

Figure 1-1: Location of Bindura Town in the National Context

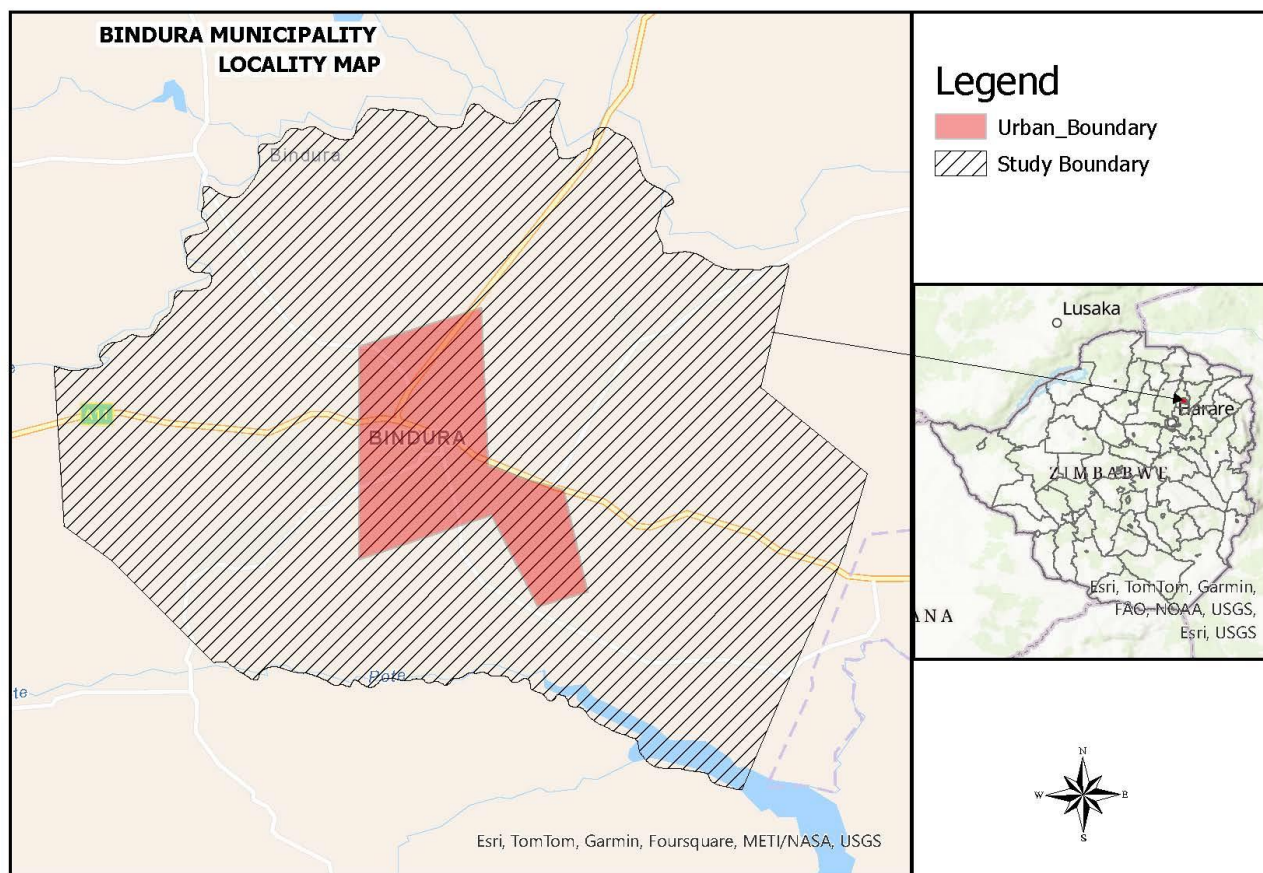
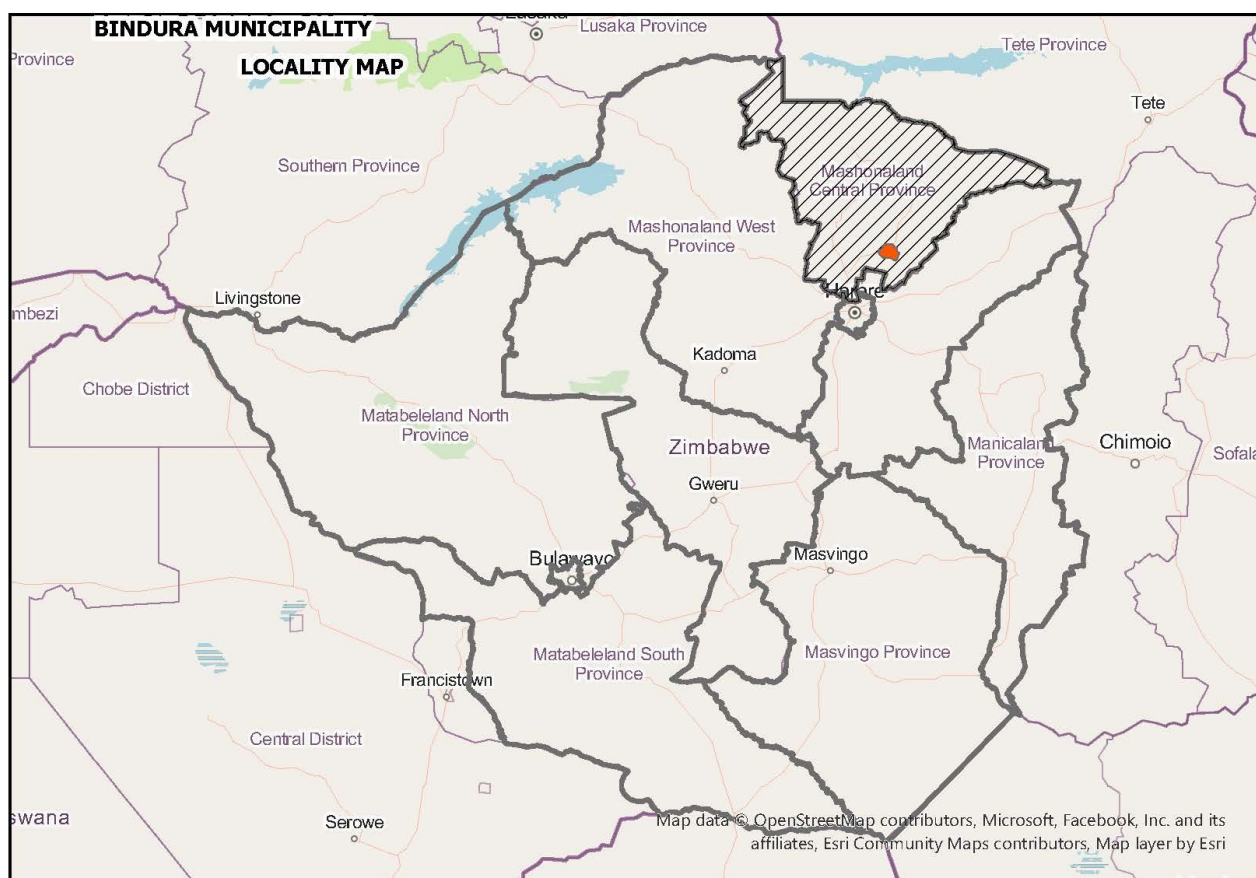


Figure 1-2: Location of Bindura Town in the Provincial



1.3 The Macro-Economic Context and Implications on the Master Plan Process

Whatever happens in Bindura Town from a spatial planning and development perspective is influenced by the broader; national macro-economic conditions in the country. It is important to present a short synopsis of the macro-economic conditions as they affect the performance of both national and local government in the country.

Traditionally, Zimbabwe's economy depends largely on its mining and agriculture sectors. By and large, the country's economy contracted for the decade 1998 to 2008. Following that deep, the economy recorded real growth of more than 10% per year in the period 2010-13, before falling below 3% in the period 2014-17. This was caused by multiple factors, the main factors being poor harvests, low diamond revenues, and decreased investment. In fact, the country's economy has continued to underperform due to lower mineral prices, infrastructure and regulatory deficiencies, a poor investment climate, a large public and external debt burden, and a high government wage expenses.

Until early 2009, the Reserve Bank of Zimbabwe (RBZ) routinely printed money to fund the budget deficit, causing hyperinflation. Following the adoption of a multi-currency basket in early 2009, this

allowed multiple currencies such as the Botswana pula, the South Africa rand, and the US dollar to be used locally. This move contributed to a reduced inflation of below 10% per year. In November 2016, there was a change in monetary policy marked by the introduction of bond notes, a parallel currency legal only in Zimbabwe, to ease cash shortages. Despite earlier intentions by Government for the bond notes to have a one-to-one exchange ratio with the US dollar, bond notes began trading at a discount of up to 10% in the black market by the end of 2016 (<https://www.google.com/url?sa; downloaded 30 April 2024>).

According to the World Bank, “Zimbabwe’s economic development continues to be hampered by several challenges. Real GDP is estimated to have grown by 5.5% in 2023, after a 6.5% growth in 2022, due to an expansion in agriculture, mining, and remittances-induced services growth. Nevertheless, macroeconomic volatility fuelled by monetary instability and substantial exchange rate distortions keeps Zimbabwe’s economic activity below its potential.

In the first part of the year; inflationary pressures remained high in 2024 as local currency depreciation intensified. In February 2024, annual inflation increased for the fourth consecutive month, reflecting the sharp depreciation of the local currency at both the official and parallel foreign exchange markets. Annual inflation increased from 26.5% in December 2023 to 47.6% in February 2024. The official exchange rate depreciated by 788% in 2023, with the parallel market premium estimated at 30% as of February 2024...Fiscal pressures increased in 2023 ahead of national elections and the transfer of the Reserve Bank of Zimbabwe’s (RBZ) external liabilities to the treasury. (<https://www.google.com/url?sa; downloaded 30 April 2024>).

Further, “real GDP growth is projected to slow further to 3.3% in 2024, partly reflecting the impact of structural bottlenecks, macroeconomic instability (high inflation and severe exchange rate volatility), an El Niño-related drought, and lower commodity prices. El-Nino-induced drought will affect most rain-fed crops and may intensify electricity supply shortages. Nevertheless, continued increases in remittances will help to stimulate growth in services (wholesale and retail trade) and construction. Inflationary pressures were expected to intensify in 2024, given drought conditions and domestic tax increases. The fiscal deficit is expected to increase in 2024, driven by high-interest payments on external debt, drought mitigation-related spending, wage pressures, and the reversal of several budget revenue measures. The fiscal deficit is projected to reach 2.5% of GDP in 2024 before slowing to under 2% in the medium term. The current account surplus is expected to shrink further, reflecting increased imports in the face of drought conditions and lower commodity prices; (<https://www.google.com/url?sa; downloaded 30 April 2024>).

Projections are that economic growth in the country will slow to 3.5 percent in 2024, representing a decrease from 4.5 percent in 2023, as agricultural output is expected to suffer from depressed global

growth and the predicted erratic and below-average rainfall caused by the El Niño weather pattern, (World Bank Zimbabwe Economic Update (ZEU); September 2023). According to the report, titled Electrifying Growth Through Reliable and Universal Energy Access, “Zimbabwe’s economy has seen a strong rebound since the COVID-19 pandemic, making it one of the fastest-growing economies in the Southern African Development Community (2021, 2022, and, part of 2023). In previous years, Zimbabwe faced increased global turmoil, while expansionary monetary policy has put initial pressure on inflation and the exchange rate. Yet, since June 2023, the Government proactively tightened monetary policy to bring down inflation and the parallel market premium. It also extended the use of US dollars as legal tender until 2030, further reducing policy uncertainty.”

The ZEU states that while Zimbabwe’s economic outlook appears moderate, it still suffers continued global headwinds, structural bottlenecks, weather-related shocks, and price and exchange rate volatility. “Prolonged global turmoil could result in a slowdown in global output, reduced trade and investment, increased volatility in commodity prices, and supply disruptions. Moreover, fiscal pressures may result in an expansionary economic policy. This could increase economic volatility, impacting private sector activity and growth. Climate change shocks may also lower economic output, particularly in the agriculture sector. Continued economic reforms will be essential to mitigate these risks, including fiscal adjustment and rebuilding foreign exchange reserves;” (<https://www.google.com/url?sa>).

With the economy of Bindura Town being predominantly mining and agriculture based, the foregoing discussion translates into constrained development in the town. As will be demonstrated in various sections of this Study Report; the performance of specific thematic sections of the Master Plan such as, among other things; housing and infrastructure development became constrained as well.

1.4 The Development Bindura Town in a Historical Context

The development of Bindura Town, when understood from a historical context; is summarized in Figure 1.4. Clearly, mining and agriculture have shaped the development of Bindura Town. For that reason, both mining and agriculture constitute the substantive issues that the Bindura Town Master Plan; past and present, has to respond to. Initially, spatial planning in Bindura Town was guided by the Town Planning Scheme of 1973. The existing Master Plan was formally approved and became operational in 1996; guiding spatial planning and development in the town till to-date.

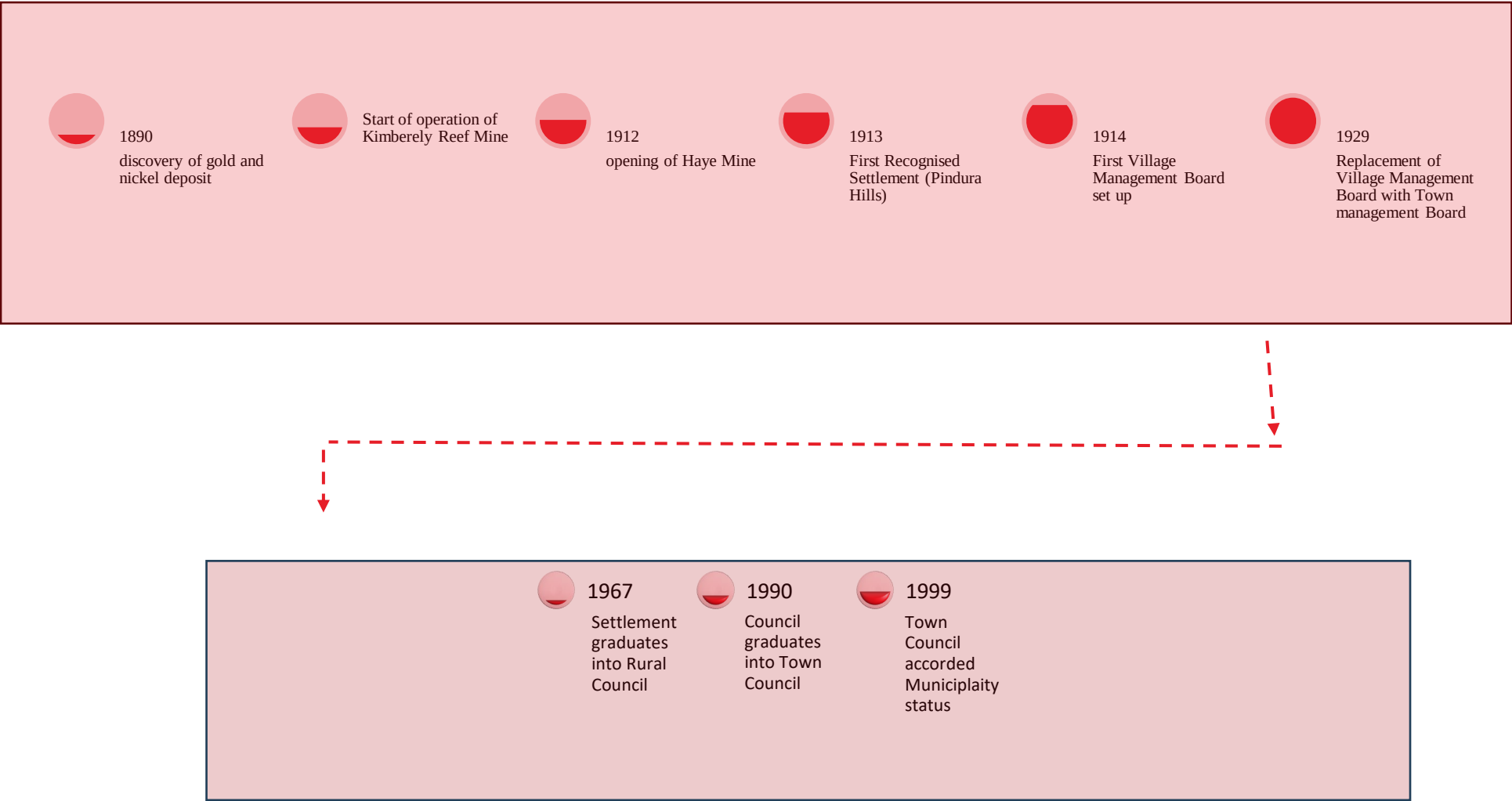
The settlement started with the pegging of The Prince of Wales Mine in 1890, followed by the ASP blocks in 1896. In 1901, mining activities on the Kimberly Reefs Mine began, followed by the Hay Mine in 1912. “In the early part of 1912 proposals for the establishment of a township were put forward, but it was not until 1913 that a suitable site for the town was chosen. The name of the

town is derived from "Pindura", the name of the Hill on whose foot the settlement was established in 1913. In 1914 the first Village Management Board was set up to administer the affairs of the town. In June 1929 the Board was replaced by the Town Management Board, and later on, Road Councils were set up to administer transport issues in the surrounding commercial area;"(Bindura Master Plan of 1996: 4).

The enactment of the Rural Councils Act Chapter 211 in 1966 paved the way for the setting up and management of rural council areas. Subsequent to that, the Bindura Rural Council was formed to administer the affairs of the settlement, starting from the 1st of November 1967. In November 1990 the settlement was elevated to a Town Council Status, leading to the formation of the Bindura Town Council as the local authority responsible for administering the affairs of the town.

"Industrial development began with the establishment of the Prince of Wales, the Kimberly Reef and Hay mines. However major industrial development came after the establishment of Trojan Nickel and Fredda Rebecca Mines. Supportive industries like engineering, electrical and transportation firms also came in. With the growth of industry, the commercial sector was established to provide commercial services to the mining and industrial areas. Residential development began when the first settlers planned ways and means of providing community services to the residents who worked in the mines;" (Bindura Master Plan of 1996: 4).

Figure 1-3: Development of Bindura Town in Historical Context



Source: Bindura Municipality Records

1.5 The Operative Master Plan

The Operative Master Plan (see Figure 1-4) is almost 27 years old; having been approved in November 1996. Tables 1.1 - 1.3 sum up the key land use and development proposals as provided for in the 1996 Written Statement of the Bindura Town Master Plan. The third column in the Tables depicts the state of implementation of the respective proposals. This analysis sets both the context and baseline for conceptualising and understanding planning issues that are relevant to the current efforts of preparing a New Master Plan for Bindura Town. Even more important is that the appraisal of the implementation of the Operative Master Plan informs key aspects of the agenda of developing the new Master Plan.

Figure 1-4: Operative Master Plan

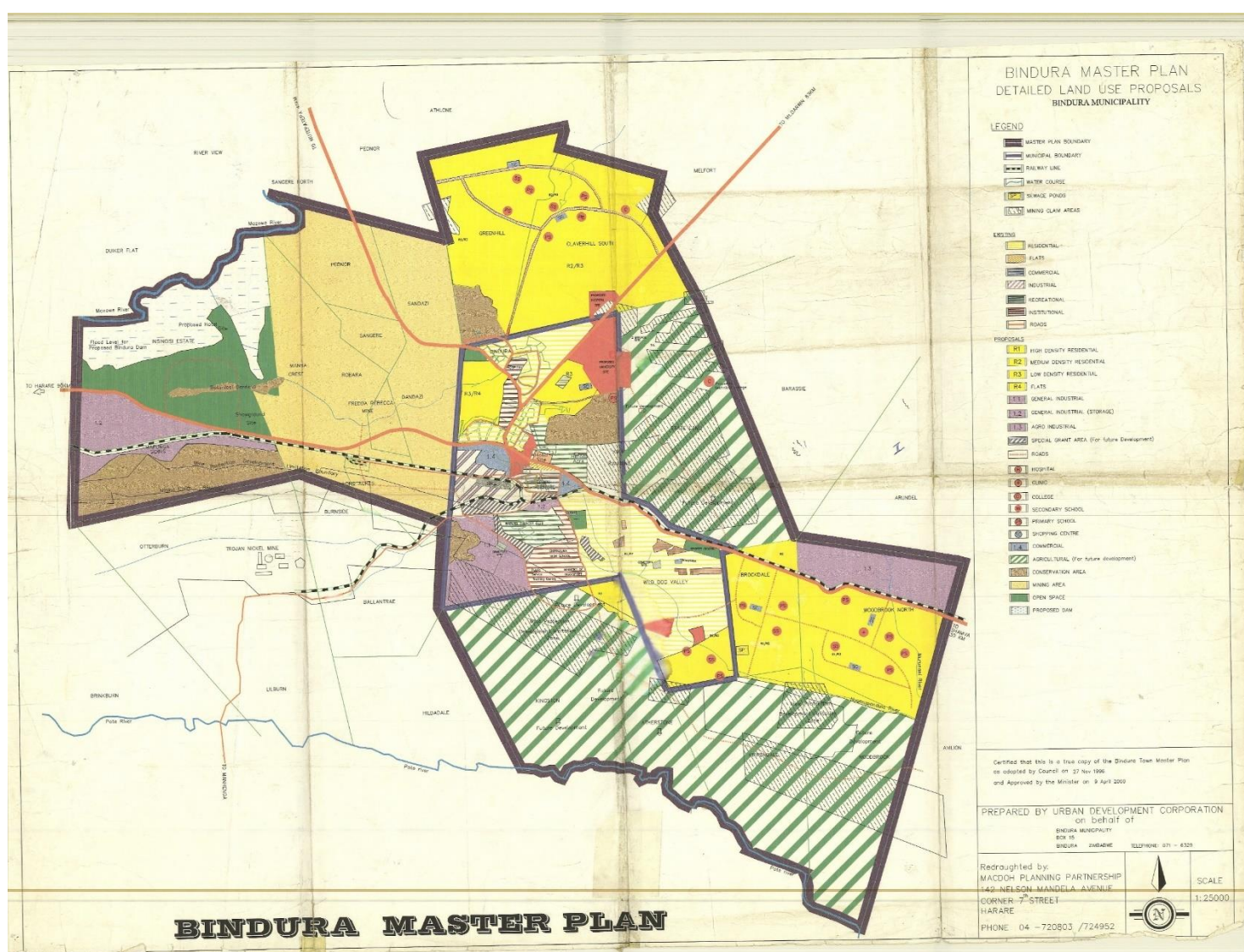


Table 1-1: Review of Operational Master Plan: Residential and Commercial

No	Strategic Direction	Implementation Status
Policy 4.1, Zone R1/R2, High and Medium Density	Land for High and Medium Density was reserved on the following properties: Claverhill South, Woodbrooke and Brockdale A Portion of Atherstone farm (38 ha) was reserved for medium density development	-Sub division layout for low density residential for Claverhill South farm was prepared and approved. Development of properties is underway and is approximately at 40%. Partial servicing of infrastructure, mainly roads opening has been done to date. - Subdivision of Woodbrooke and Brockdale farm was done and approved. Servicing was done partially. Development of properties is underway and is approximately at 40%. -Atherstone farm was wholly subdivided into a mixed density layout with low, medium and high density stands. Phased servicing and development is underway and is at approximately 30%
Policy 4.1, Zone R1/R2; Medium and Low Density	Greenhill Farm was reserved for Low/Medium Density Residential Portion of Kimberly State Land was reserved for Low Density Residential Development	-Sub division layout for low density residential for Greenhill Farm was prepared and approved. Development of properties is underway and is approximately at 30%. Partial servicing of infrastructure, mainly roads opening, and water reticulation has been done to date. - Kimberly farm which was earmarked for future development was not developed due to the high numbers of mining claims in the area. Two universities namely Zimbabwe Ezekiel Guti University and Bindura University and a few low-density residential stands are the only notable development in Kimberly State Land.
Policy 4.1, Zone R4 Flats	A Local Development Plan was to be developed for the town centre, to allow for the development of Flats in the city centre Vacant Land west of the Police Camp was reserved for Flats development	No development of flats in the city centre was done during the period under review.
Policy 4.2, Commercial	Relocation of all light industrial activities away from the town centre to make way for commercially oriented activities	The relocation of industrial activities away from the town centre was done with notable examples of Bindura Haulage Transport Company; Hammond Steel Engineering; John Turner Steel Engineering, Pfura Steel Engineering Company and H.M Steel Engineering Company to mention a few.
	Increase bulk factor for the development of multi-storey buildings which accommodated shops on the Ground Floor and Office space on the upper floors	The bulk factor for Bindura town is not more than three stories. All new commercial buildings in the new CBD extension layouts near the show ground area and the eastern NASA complex area are being constructed. So far there are now more than 20 in the town.
	Incorporate the existing showgrounds into the Central Business Area	A draft layout plan was prepared on the areas outside showground and is not yet approved. Government has proposed to do a smart city proposal in the showground area. The Govt. architects are still working on the proposal.
	Upgrade Local Shopping Centres in the High-Density Areas, especially in Chipadze	Nothing was done.

Source: *Author Compilations from the Bindura Master Plan Written Statement; 1996; and Bindura Municipality Responses*

Table 1-2: Review of Operational Master Plan: Residential and Commercial

No	Strategic Direction	Implementation Status
Policy 4.3; Industrial	Relocate the Rifle Range to make way for Industrial Development	The rifle range area was planned for an industrial stand layout and the developments are already underway.
Policy 4.3, Zone 1.1, Light and Service Industry	Land to the south of the CMB, and west of the Public Service Training Centre, and land west of the existing industrial area, along the Bindura-Trojan Road was reserved for service /light industrial uses Land between the railway line and Bindura Country club was reserved for Warehouses Sewage ponds that served the town centre were to be relocated	The land was planned for heavy industrial stands, the stands are being developed and they're about 20% development status. Infrastructural servicing is about 15%. Sewerage ponds were relocated to the new Woodbrook sewer treatment plant, the area between Bindura Country Club and railway line was planned for warehousing industrial stands. The development stands at about 15%.
Policy 4.3, Zone 1.2, General/Storage Industry	Insingizi Farm, south of the Harare-Bindura Road; was reserved for general industrial activities (pollution free activities and bulk storage)	There is no development yet on the stated farm. Agricultural activities are still ongoing.
Policy 1.4, Industrial (Sugar Mill Site)	Woodbroke North Farm was zoned for Agricultural /Industrial	There is no development yet on the stated farm. Mining activities are the only notable activities ongoing.
Policy 4.4; Institutional and Recreational Facilities	The northern portion of Kimberly Stateland was zoned for institutional development	Bindura University Of Science Education; Sports Academy And Zimbabwe Ezekiel Guti University were planned and are now operational in phased development.
Policy 4.4.1; Health Proposals	A provincial hospital site measuring 43 ha was provided for on Claverhill South Two clinic sites were proposed, one in the High Density area on Woodbroke Farm and the other on Claverhill	The Hospital and all the clinics are yet to be developed.
Policy 4.4.2, Education Proposals	School sites were proposed within different residential neighbourhoods; with exact location and numbers determined at layout level Sites for a University College and Technical College, measuring 120 ha and 73 ha respectively on Kimberly state land	Three primary schools namely cornerstone primary school in Chipindura Park, Chiwaridzo Primary School in Chiwaridzo 2, and Brockdale Primary School in Brockdale and a secondary school namely Chiwaridzo Secondary School were constructed and are currently operational. Zimbabwe Ezekiel Guti University was planned and constructed and is operational. The Technical College is yet to be constructed.
Policy 4.4.3; Recreational Proposal	Establish recreational areas in open spaces; both active (e.g. football grounds, and passive (e.g. parks; gardens); All provided via a Local Subject Plan The Subject Plan was expected to provide for: 1. Provision for a site for Agricultural Show grounds 2. Reservation of land for development of Botanical Gardens	-Recreational areas were planned in Claverhill, Greenhill, Woodbrook, Brockdale and Atherstone and none was developed. The site for the agricultural show grounds have been reserved in the Isingizi farm and is yet to be developed.

	3. Reservation of Hotel Site	Nothing was undertaken for the botanical garden's development. Nothing was done for the hotel site.
Policy 4.4.4; other Facilities	A site covering portions of Claverhill South and Kimberly State land, measuring 240 ha; was reserved for the construction of Army Barracks Provide sites for crèches and churches, & libraries in all residential areas Provide land for entertainment centres (cinemas, nightclubs, hotels) Provide land for charity organizations working with the less privileged	There was no development of the army barracks on the area of Claverhill south and the Kimberly state land. Site for crèches, churches and libraries were provided in their respective operative layouts. There was only land for night clubs in the commercial centres and are currently operational. There was notable provision of orphanage stands in the Greenhill, Claverhill, Woodbrook and Bindura township and there is currently no development on all the proposed stands.

Source: *Author Compilations from the Bindura Master Plan Written Statement; 1996; and Bindura Municipality Responses*

Table 1-3: Review of Operational Master Plan: Transport and Public Utilities

No	Strategic Direction	Implementation Status
Policy 4.5, Transport	Widening existing narrow roads, especially in High Density Areas, to ensure reserves of at least 8m Tar and maintain all local (12 m roads) and district distributors (20 m roads) Improve road markings, signs and signals on the major roads within residential areas and the CBD to reduce incidence of traffic conflict Provide link roads between the different land use Provide for adequate parking and terminal facilities within each land-use zone Provide a bypass from the Harare-Bindura road, to the industrial area, to separate traffic to the CBD from traffic to the industrial area	There was no widening of narrow roads done during the period under review. All major roads and district distributors and all the roads in the CBD are being marked periodically. Road signals have been installed in the CBD and all suburbs and traffic lights were installed in major road junctions in the CBD. Adequate parking facilities is being provided in the CBD from the main roads to the downtown areas in the form of marking of more parking bays. No bypass road connecting the industrial area from the Harare - Bindura road was constructed.
Policy 4.6, Public Utilities	Extend water supply to individual households in the single quarters of Chipadze, where communal water points were in place Provide individual ablution facilities to households in the single quarters of Chipadze and abolish the provision of communal facilities Upgrade the existing sewerage reticulation system to meet the upsurge associated with future development in residential and industrial areas Put all new low density residential developments that are located in difficult terrain on septic tanks in order to reduce the cost of servicing	No extension of water supply to individual households in the single quarters of Chipadze was done. No provision of ablution facilities to individual households in the single quarters of Chipadze was done. Sewerage reticulation system was upgraded in Chipadze, Chiwaridzo and part of the CBD by replacing the old clogged pipes with new bigger pipes. All sewerage ponds in water courses were decommissioned and the flow was channelled to trunks

	Sewerage ponds were to be relocated from close to water courses to Kippendale farm Undertake a thorough study on the impacts of sewerage and reticulation system, especially the treatment works on different land uses and on water course	to Woodbrook main sewerage treatment plant. All new low density residential developments were put on septic tanks. Sewerage ponds located close to water courses around the town were relocated to Woodbrook Treatment plant.
4.7; Environmental Proposals	Protect all dams from siltation and agro-chemical and other forms of pollution Protecting all stream banks and water courses, through for instance, restriction of cultivation and the construction of buildings Relocate the garbage disposal pits to the outskirts of the town Close down some existing sewage ponds especially those close to residential areas on the windward side	Challenges in restricting urban cultivation of stream-banks and wetlands still remains, with the lack of enforcement mechanisms as the main cause. No construction of buildings is being allowed in water courses. A proposal to relocate the refuse dumping site from the current site to the new landfill site in Kingston farm is at an advanced stage, the site plans are already in place. Sewerage ponds located close to water courses around the town were relocated to Woodbrook Treatment plant.

Source: *Author Compilations from the Bindura Master Plan Written Statement; 1996; and Bindura Municipality Responses*

Informed by the foregoing review; and based on an elaborate analysis of the current situation in Bindura Town; the next section presents a synopsis of the critical planning issues that the New Master Plan must respond to.

1.6 Emerging Issues from the Review of the Operative Bindura Master Plan and a Synopsis of Critical Planning issues

The review of the operative Master Plan, a thorough analysis of key documentation and discussions with stakeholders led to the following planning conclusions:

- The review of the Operative Master Plan, and evidence from the discussions with Bindura Municipality and other key stakeholders have revealed that the town has exhausted land available for development. Vacant land suitable for development barely exists, and hence a key priority for the current efforts is to address that particular bottle-neck.
- Based on the Review of the Operative Master Plan, it is evident that there are several activities that will continue into the future. A case in point is the planned redevelopment of houses in the Chipadze Old Location. Evidence shows that the houses, constructed as single quarters in the 1960s, and the supporting communal water and sewer facilities; are in a dilapidated condition (see also discussion and evidence in Chapter 8 on the Housing Sector). It is inevitable that planned interventions that were not implemented remain relevant going into the future. Effectively, this constitutes what one can call the “Balance Brought Down” from the operative Master Plan, set to be continued under the New Master Plan.

- *Gaps and Omissions in the Implementation of the operative Master Plan.* Implementation of the provisions of the operative Master Plan has gaps and omissions. A case in point is that one proposal containing a proposed high-order, major distributor road was not implemented. Instead, the road reservation was un-procedurally converted into some other land-use.
- Mining as an activity is dominant in Bindura Town and its neighbourhood. Yet, it is evident that mining as an activity it has both positive and negative aspects. The positive aspects are key to the development of Bindura Town and beyond; particularly in terms of industrial production, employment creation and its support to downstream activities, especially those related to supporting SME activities. However; mining as an activity is also in direct conflict with the requirements of urban development. Land that was zoned for the planned CBD expansion became unavailable for that purpose because of the conflicting situation between owners of the Botha Mine Claim and the requirement of Urban Development. Clearly, Section 35 of the Mines and Minerals Act becomes relevant in as far as it provides for setting reservations against prospecting and pegging.
- Further to the above, mining often has detrimental effects to the environment through pollution of both underground and surface water, while also leaving behind large excavations (effects of open cast mining) that cannot be easily rehabilitated once mining operations shut down. There are extensive mining related excavations in Bindura Town, both past and ongoing. Part of the Botha Mine Claim is located closest to the CBD; while abandoned pits are widespread in the Town. There is clear evidence on how mining has threatened the existence of both railway and road infrastructure inside Bindura Town. Current operations by Ran Mine have caused the piling of massive rock excavations along the Bindura - Shamva Road. Even more striking is that the planned development of Kimberly Statelands could not take place because of extensive, open cast mining on the said lands. In some sections of Bindura Town, residential development has even taken place on land under Mine Claims. For these reasons, the Bindura Master Plan has a critical task of levelling the playfield between mining and urban development.
- As is discussed elsewhere in this Report, most of the population in Bindura Town, just like elsewhere in the country, is employed in the informal sector. To this end, the space needs of the Small and Medium Scale Enterprises (SMEs), commonly referred to as the informal sector; have to be addressed at the Master Plan level. An analysis of the existing layouts in Bindura Town shows that there is no deliberate attempt to provide for specific stands for use by the SME sector
- In the post-2000 period, Zimbabwe implemented a comprehensive land reform programme that not only changed the agricultural landscape in the country; but the peri-urban environs of

the major towns and cities as well. In view of this, the Bindura Master Plan has to negotiate with the outcomes of the Land Reform Programme in peri-urban areas. In many situations, displacements of resettled communities in peri-urban zones are imminent in order to make way for urban development.

- *Environmental considerations remain pertinent in Bindura.* The issue of mining related excavations and their damage to the environment have already been alluded to. Other key environmental issues relate to the management of wetlands in Bindura Town in the face of increasing pressures from urban development. There are also well known urban development processes that have a potential to cause environmental problems. A case in point is river-sand and pit-sand extraction by the construction industry; a process that; if not managed properly; can cause uncontrolled excavations, leading to soil erosion and the subsequent siltation of water bodies; among many other negative outcomes associated with the activity.
- *Uncoordinated Land Allocations.* There is evidence of uncoordinated land allocations for land covered under the operative Master Plan but has not yet been legally transferred to Bindura Municipality. For instance, Bindura RDC still claims ownership of farms which are in essence land covered under the existing Master Plan. The Ministry of Lands has equally been responsible for parcelling out some of the land on Kimberly Farm. It seems as if there were issues with the allocation of land to ZEGU, with some records showing that the University was initially allocated 50 hectares of land, which was subsequently increased to 140 Hectares, yet other documentation show that a whopping 500 hectares was allocated to the university.
- *Incorporation of Master Plan Land into Municipality Boundary.* Ordinarily; the approval of the 1996 Master Plan was expected to trigger a subsequent process that would lead to the incorporation of all zoned land into the Bindura Municipality Boundary. This process did not happen, and hence the two boundaries as defined by current the Municipality Land and the 1996 Master Plan Boundary still exist separately. Thus, as at 1996, land under Bindura Town Municipality stood at 1900 ha, compared to 8600 ha under the Master Plan boundary. This has not change till 2024, 28 years later. In view of this, a key priority of the new Master Plan is to ensure the timely implementation of Part III; Section 15 of the Urban Councils Act on procedures pertaining to incorporation of rural land into urban land.
- *The Bindura Town Master Plan in the Context of Climate Change.* The challenges associated with climate change have gained cognisance at global; regional and national levels. Urban Master Plans represent one clear intervention that has to respond to the challenges associated with the climate change phenomenon. Stakeholder consultations further reinforced the need for the Bindura Town Master Plan to respond to such critical issues. It is therefore imperative

that both the Report of Study and the Written Statement address issues relating to climate change.

The foregoing summary discussion highlights the core issues that the New Master Plan has to deal with in a decisive manner.

1.7 Chapter Outline

The rest of the Report is structured as follows:

- i. Chapter 2: Definition of the Study Area and the Study Approach
- ii. Chapter 3: Climate and Physical Features
- iii. Chapter 4: Overview of the Built Environment
- iv. Chapter 5: Land Use, Land Ownership; Land Utilization and Land Tenure
- v. Chapter 6: The State of the Environment
- vi. Chapter 7: Population; Employment and the Local Economy
- vii. Chapter 8: The Housing Situation
- viii. Chapter 9: The State of Social Service Provision
- ix. Chapter 10: The State of Infrastructure Provision
- x. Chapter 11: Finance and Institutional Set-up
- xi. Chapter 12: A Summary of Issues

Chapter 2 : Approach and Methods

2.1 Introduction

This Chapter presents information on the Approach and Methods to prepare Report of Study and the Written Statement). Essentially the approach was premised on understanding the dynamics of key thematic areas/issues affecting and influencing development in Bindura Municipality area (see Figure 2.1) and the requirement of Part IV of the Regional, Town and Country Planning Act, Chapter 29:12 as read with the Statutory Instrument 248. From such an understanding; the Consulting Team was able to plan and produce a framework to guide data collection, analysis and preparation of the Report of Study and feed into the Written Statement document.



Figure 2-1: Conceptual framework shaping our approach to the Bindura Municipality Master Plan Report of Study Preparation.

The Approach adopted by the Consulting Teams was guided by the requirements of Part IV of the Regional, Town and Country Planning Act, as read with Statutory Instrument 248 (1977), Ministerial Directive and guidelines as well as Best Practice requirements. Guided by that, the Consulting Team undertook the following:

- Identified the key thematic issues affecting and influencing the development trajectory of the Municipality (as provided for in the RCTP Act and as inputted by relevant stakeholders; e.g. the sector ministries or Bindura Municipality etc.); and
- Carried out studies including Engagement of Stakeholders at various stages of Plan preparation.

2.2 Setting up the Consulting Team

The Consulting Team engaged Council departments, Ministries and other critical stakeholders in Bindura before and during data collection; as well as engaging experts at different Ministry Head Offices. A Multidisciplinary Team was put in place; with team members having experience of

working across disciplinary boundaries. This gave solid strength to the team, and thereby allowing the Consulting Team to integrate sustainability considerations into Policy Proposals, while also being sensitive and alert to the clients' and stakeholders' requirements. The Consulting Team was made up of the following specialists: town planners, engineers (water and sanitation and roads); GIS Specialist, Environmental Scientist.

2.3 Secondary Methods of Data Collection

The first stage started with an intensive collection and analysis of secondary data from multiple sources. Bindura Municipality critical; key information relating to; inter alia; current and past layout plans; Existing Bindura Master Plan (Map only); Bindura Composite Map and some data covering mining claims. Table 2.1 summarizes details of past and current layouts as received from Bindura Master Plan. Figure 2.1 shows the Bindura Composite Map

Figure 2-2: Layout Plans in Bindura Municipality

Year Of Development	Layout Name/ Number	Major Use	State of Implementation	Area Coverage
5/7/2016 13/10/16	Greenhill North	Low density	Existing	
	Claverhill South	Low density	Planned, undeveloped	
	Sengere	Not yet defined	Farm	
	Greenhill main	Low density	Existing	
	Brockdale			
	Burnside estate	Low density	Planned, undeveloped	
	Hildadale	Not yet defined	Unplanned	
	Kingstone	Not yet defined	Unplanned	
	Lilburn	Not yet defined	Unplanned	
	Kipperndale	Not yet defined	Unplanned	
30/6/2010	Woodbrooke North	High density	Planned, undeveloped	
	Chipindra Park	Medium Density	Planned, undeveloped	
	Otterburn	Not yet defined	Unplanned	
	Melfort	Not yet defined	Unplanned	
	Barassie	Not yet defined	Unplanned	
	CBD	Commercial	Existing	
	Isingizi Estate	Mixed (Part Industrial, Part not planned)		
	Chipadze Township/ H145	High Density	Existing	
	Chipadze Extention			
	Aerodrome	Medium Density	Existing	
7/8/2017	Chiwaridzo	High density	Existing	
	Long Acres	Mixed (Part residential, part industrial)		
	WildDog Valley			
	Atherstone	Not yet defined	Planned, undeveloped	

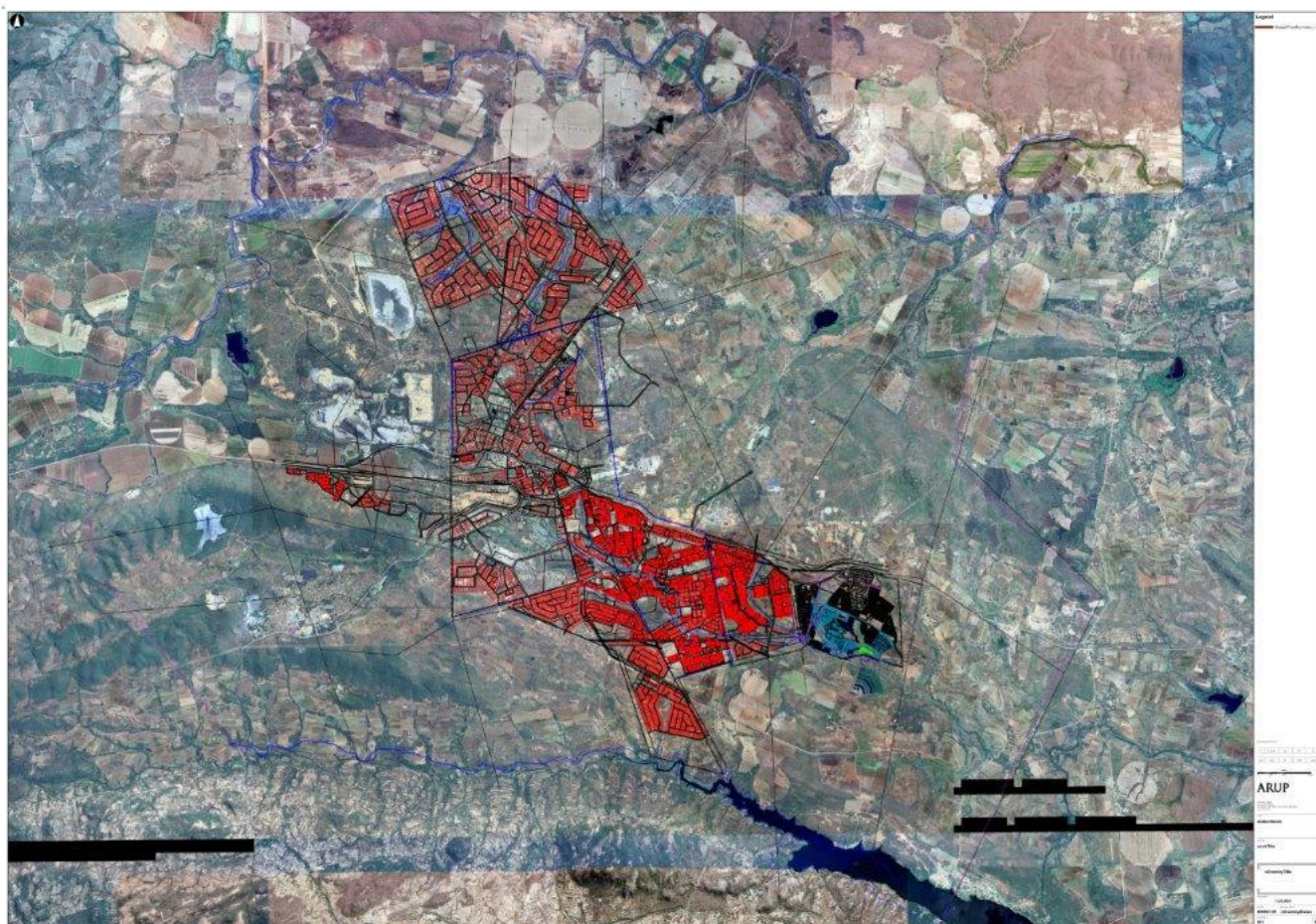
Source: Compiled from Bindura Municipality

Other examples of secondary data collected are:

- Maps and drawings of the Project area
- Climatic data
- Mining claims and other mining related data
- Hydrological Records (catchments and drainage), including major rivers, dams and reservoirs (supplying bulk water to the urban area).
- Land use data covering the various urban land uses (including major activity nodes and corridors wetlands and environmentally sensitive areas)
- Population statistics and census data, including information on economic activities from the Central statistics office, including published/official data on informal employment sector where available.
- Communication/logistics systems and dynamics in the district
- Housing waiting lists if any, building plans, Special Consent and Change of Use /Regularisation applications, subdivision records (for both approved and proposed layout plans to assess housing demand/supply dynamics) as well as illegal and peri urban and mining settlement developments.
- Demolition and Prohibition records etc.
- Traffic Records
- Geotechnical and Geological Reports
- By-laws and building codes
- Health and Education statistics

Secondary data collection included analysing of maps (e.g. EMA Wetlands maps for Bindura Municipality overlaid on town planning layouts, where necessary) and aerial imagery of the site to gain an overview of other land uses such as the mining activities and related environmental issues from the previous mining activities. Further, a review of the Zimbabwean regulatory environment and relevant policies and guidelines as well as international standards applicable to the study will be undertaken.

Figure 2-3: Bindura Municipality Consolidated Mapping



Source: *Compilation Google Earth and Bindura Municipality Records*

2.4 Primary Methods of Data Collection

Primary data collection was collected using Key Informant interviews, Focus Group Discussions, Direct Observation, and the taking of photographs. In essence, primary data collection was be undertaken where necessary in order to validate the data collected from official records. Illustrations of specific thematic issues analysed through field surveys are the following:

- State of natural resources, including wetlands inventory and documentation
- Pollution sources inventory and documentation
- Land degradation, inventory and documentation
- Water Resources quantities and quality assessment
- Air quality data,
- Flora and Fauna assessment
- Assessment of mining activities on the environment'
- Socio-economic environment,

2.4.1 Key informant interviews

In general, Key Informant Interviews were used to collect data to fill data gaps on, inter alia, land-use and support infrastructure housing issues that could not be picked by remote sensing. A mapping of individual production/activity nodes was done as guided by Key Informants. Key informers also provide data to fill gaps on the provision of social facilities. Key Informant Interviews were used to collect data on institutional capacity of relevant agencies, particularly the Bindura Municipality. Data from specific stakeholders like SMEs was collected using Key Informant Interviews

In general; specific Key Informant Interview Checklists were developed for all relevant stakeholders.

2.4.2 Direct Observation

Direct observation was undertaken, targeting specific thematic issues. Illustrations of thematic issues covered by direct observation are the following:

- Specific dimensions of land uses e.g. land utilization levels
- Condition of infrastructure (roads, water) and pollution issues
- Buildings condition assessment
- Water supply infrastructure, covering raw water abstraction, treatment facilities, transmission infrastructure, storage facilities

Further, direct observation was supported by the taking of photographs.

2.4.3 Public Participation Meetings

Meetings were held with major stakeholders such as regulatory authorities and other affected and interested people. Comments from the Public meetings were be incorporated into the final the reports.

2.4.4 Stakeholder Consultation

A critical part of the Master Plan Preparation Process was the engagement of key stakeholders of Bindura Master Plan. The aim was to liaise with the client's representative(s) to confirm the key stakeholders of the project and establish a clear strategy of coordination with the respective parties. A simplified List of Stakeholders is presented in Figure 2.3. Table 2.3 further presents the type of data sourced from the different stakeholders.

Figure 2-4: Stakeholders and Data Needs

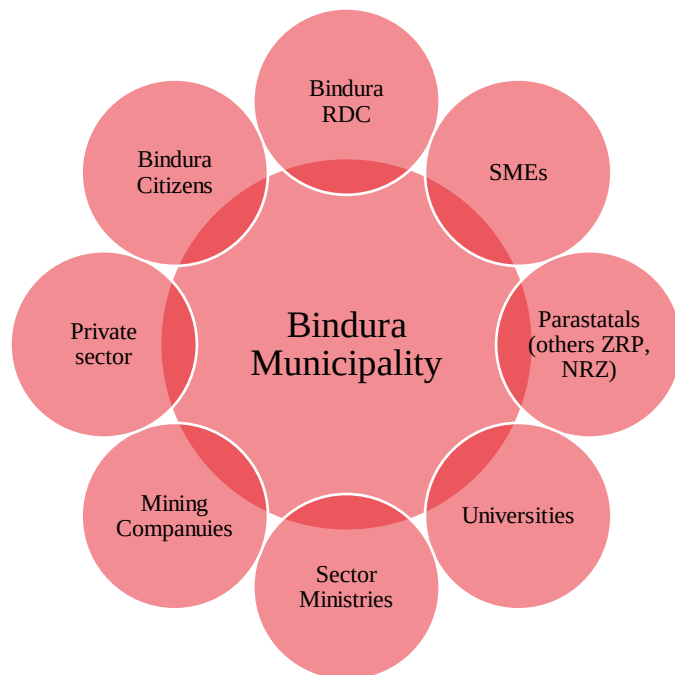


Table 2-1: Stakeholder and Data Requirements

Stakeholder	Illustration of Data Requirements	Data Format/Indicators
Bindura Municipality	Schematic (fresh water and waste water) Planning information Housing information Land ownership patterns Service delivery and service appraisal Future development plans	Reports Minutes of Meetings Layout Plans M & E Reports Fresh and Waste Water and Leakage reports State of freshwater and waste water infrastructure
Mining Companies and Mine Claims	Area covered by mining claims Type of mining Employment in the Mining Sector	Services provision in mining areas Impacts of mining on the environment, claims mapping
Sector Ministries		
Education	Distribution of schools by area Schools Enrolment	Statistics on enrolment Statistics on school distribution
Health	Distribution of health facilities Disease outbreaks	Hotspot areas, Statistics on disease outbreaks
Lands and Agriculture	Land uses surrounding Bindura Municipality	Resettlement statistics of farms surrounding Bindura by resettlement model
EMA	State of wetlands Environmental degradation	Location and condition of wetlands Siltation Data

Ministry of Transport	Transport Safety issues in Bindura Traffic volumes in Bindura and the Harare-Bindura-Mukumbura Highway	Historical data covering safety issues
Social Services	Poverty situation; social safety nets	Poverty Indicators; Statistics on distribution of social welfare provisions
Universities	Student Population Accommodation requirements of students Other Support services to the student population	Student enrolment Area of university land Expansion plans
Parastatals		
NRZ	NRZ servitudes and reserve land	Size of Land under NRZ servitudes
ZETDC	Electricity supply in Bindura Distribution of servitudes Area under servitudes	Serviced and un-serviced areas Maps showing distribution of power servitudes;
Private Sector Telecom Service Provider and NetOne	Distribution network of telecom infrastructure	Maps showing network infrastructure; Number of subscribers in Bindura Town
ZRP	Data on traffic congestion points	Accident Hotspots in Bindura Town
Citizens and Resident Associations	Perceptions on service delivery and quality of the environment Housing factors Incomes and employment	FGD reports Statistical information on tenants, incomes; household sizes etc

Source: *Authors*

2.5 Remote sensing

Land use land cover (LULC) change detection based on remote sensing data is an important source of information for various decision support systems. Information derived from land use and land cover change detection is important to land conversion and conservation, infrastructure development, identification of underutilised developable areas and management of water resources, including wetland areas where applicable. The purpose of this study was to identify and quantify change in land use and land cover detection of the Bindura study area for agreed time intervals, using Landsat TM 30 m resolution images. ENVI and Arc GIS software was used to identify the changes.

2.6 Specialised Assessment of Bulk Infrastructure

A specialised assessment of bulk infrastructure was undertaken. For this exercise; the Consulting Team carried out the following studies (secondary data collection):

- Roads and Storm Water Drainage

The storm water drainage system was reviewed, and comments made on the quality and condition of piped storm water drainage systems as well as the open drainage systems usually used in selected nodes.

- Potable Water Infrastructure

Determination of abstraction points, water treatment capacity and reservoir capacity was based on estimation of water demand for selected nodes/areas.

- Water Demand

Available water consumption figures were analysed to determine existing demand in selected node/areas. The water treatment works production figures were analysed to determine whether there is a correlation between the water production figures and assessed or projected water demand figures. With the relevant data obtained from the data collection exercise, the water balance was estimated based on Zimbabwean guidelines and the following parameters:

- Projected population figures
- Water use by consumer category being.
 - Domestic
 - Industrial
 - Commercial
 - Institutional
- Demand patterns and peaking factors
- Hydraulic requirements such as: velocities, friction coefficients and pressures
- Storage periods for service reservoirs

The existing water demands for different zones within the water supply network were determined. The projected water demands were then be calculated based on the proposed developments and expansion plans for the various zones within Bindura Municipality.

- Bulk Water Sources

The capacities and reliability of the existing bulk water sources were assessed and compared with the bulk water demands.

- Water Treatment Facilities

The capacities of the existing Water Treatment Facilities were evaluated, together with their effectiveness and resilience to cope with fluctuating or increased water requirements.

- Bulk Water Supply Infrastructure

The capacities of the bulk facilities including pumping systems, power supply, water pipelines, valves, etc. were determined, and current and projected requirements analysed. Where possible, readings from bulk meters will be used to assess utilisation patterns.

- Storage Facilities

The bulk storage requirements were assessed for both current and future development and compared with the current storage facilities. The quality and size of the existing facilities were evaluated, and recommendations made for future storage requirements.

- Bulk Distribution

The bulk distribution was reviewed and the locations of isolating valves at strategic locations was determined.

- Sewerage Infrastructure

The sewage reticulation network was assessed, the various catchment zones determined and flow in the outfall sewers estimated.

- Sewage Treatment Works

The capacities of the sewage treatment works were determined, together with their effectiveness in treating sewage. The capacities were compared with sewage generation estimations for current and future development, and necessary expansion requirements will be determined.

- Effluent Disposal Facilities

The disposal of sewage effluent were reviewed, and any improvements or upgrades recommended.

- Waste Management Facilities

The capacities of the existing management facilities for both Municipal and Industrial waste was assessed, and the effectiveness of the treatment processes evaluated. Proposals for any modifications or expansions required for future development was made.

2.7 The Overall Flow Process

Figure 2-5: Master Plan Preparation Critical Stages

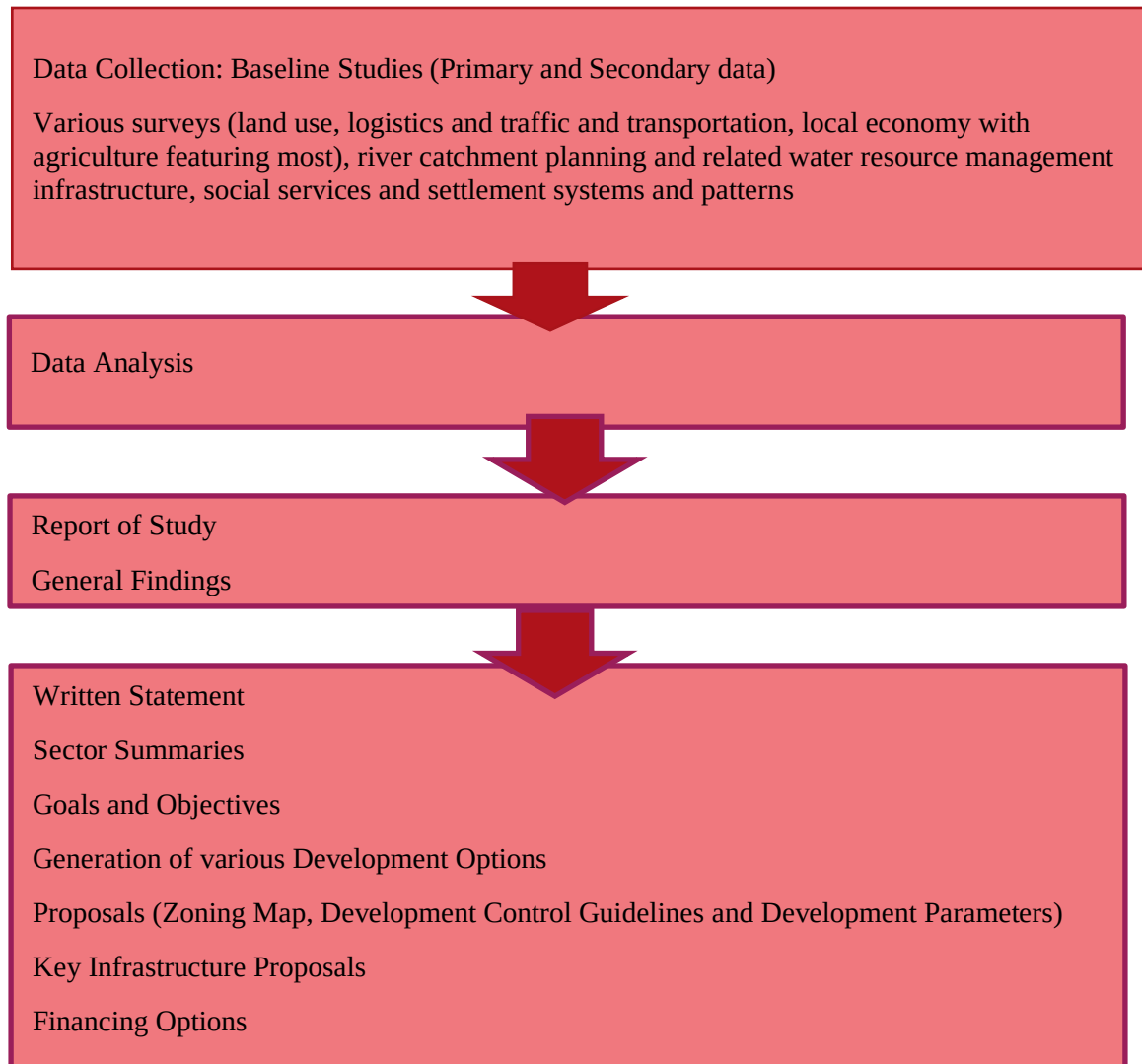
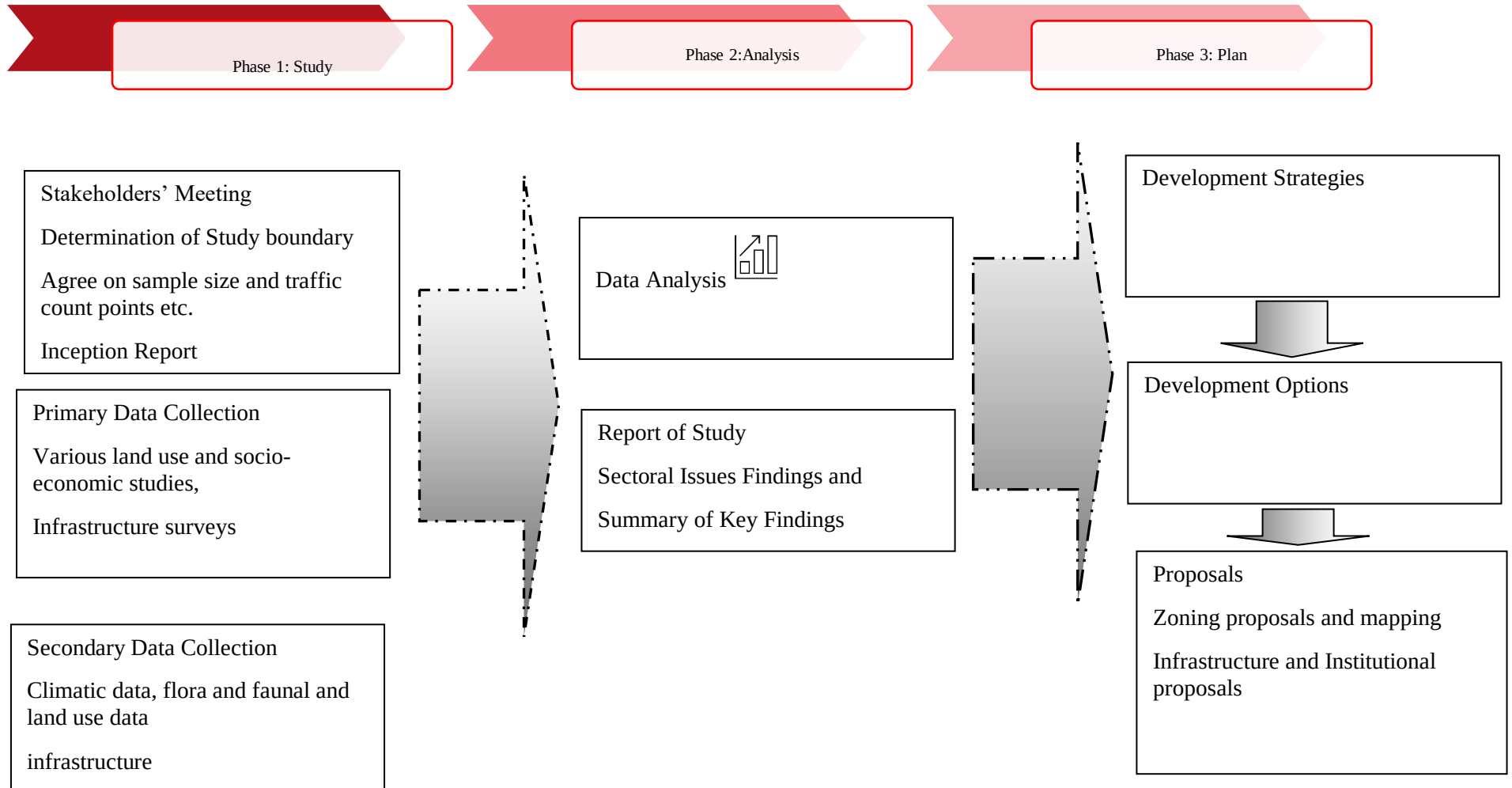


Figure 2-6: Summary of Approach



2.8 The Expected Deliverables

The expected outputs of the assignment were:

- The Report of Study
- The Written Statement; made up of Key Master Plan Proposals maps; and diagrams. ; and
- GIS Maps, Shapefiles and databases.

Chapter 3 : Climate and Physical Features of Bindura Town

This Chapter elaborates on the climate and key physical features of Bindura Town. It gives an analysis of; inter alia, topography and geology; climatic conditions, vegetation; soils; and vegetation. These details are particularly important as they influence specific dimensions of the Master Plan (see for instance discussion in Section 3.5, this Report).

3.1 Topography and Drainage

Bindura Town lies within Agro-Ecological Region IIA; with an altitude of 1091 metres above sea level. In general, Bindura Town and its immediate environment has an uneven topography, and a key distinctive characteristic of the area is the rugged nature of the terrain. The town lies on a watershed from which key tributaries of the Mazowe and Pote rivers originate.

Figure 3.1 shows the elevation map for Bindura. A significant part of the part is on elevation that is too steep for development to take place. From the map, the blue portion represents the steepest gradient which ranges from 1 242 848 to 1 331 000m.

Figure 3-1: Elevation Map for Bindura Town

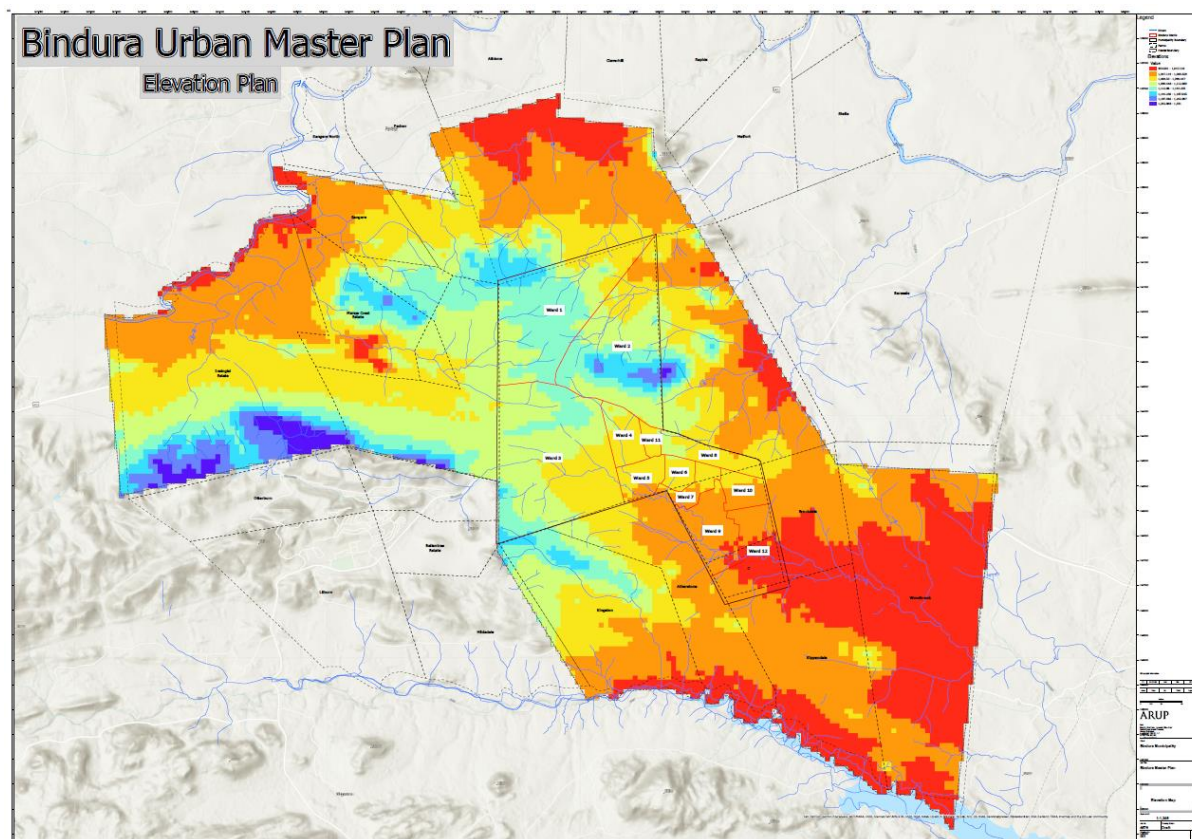
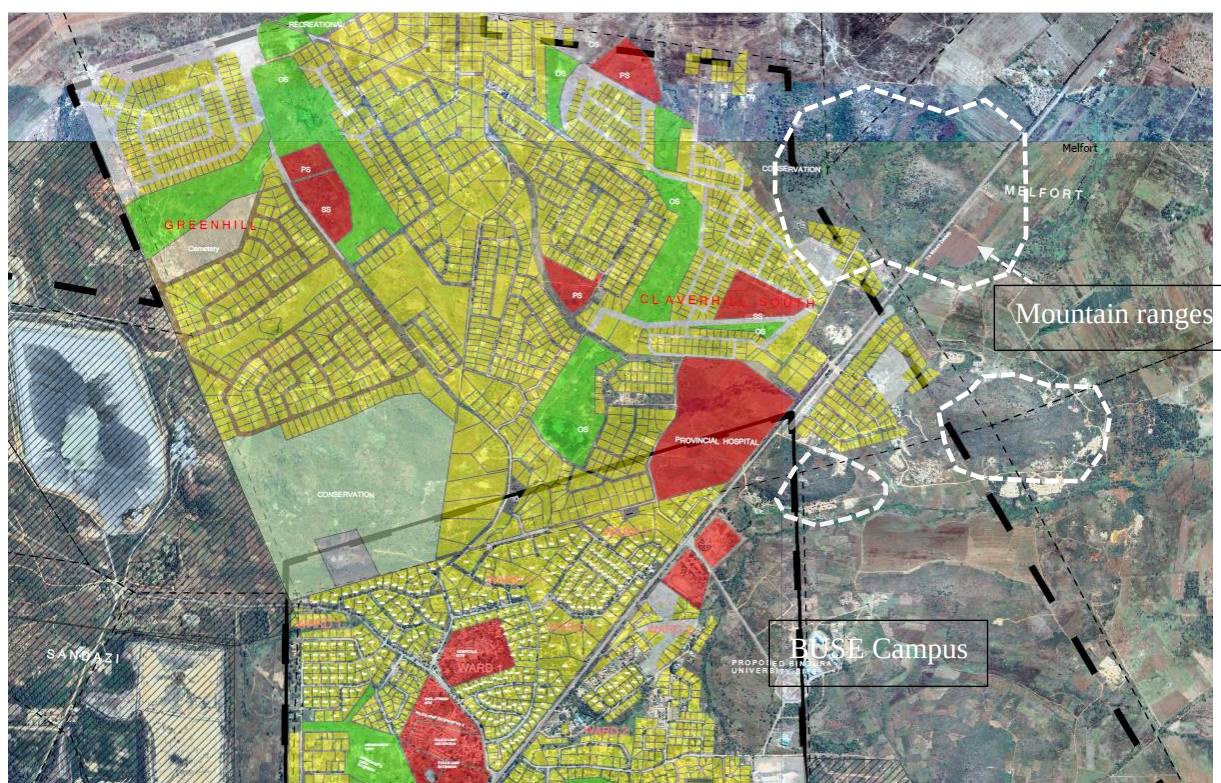


Figure 3-2: Topographical Map Showing the Mountain Range that have Trojan Mine Claims

Figure 3-3: Mountain ranges to the North-West of Bindura Town



Tributaries drain towards the south east into Pote River and westwards and north-east into the Mazowe River, with both rivers being perennial. The Mazowe River and small dams like Insingizi provide water during the rainy season. During the dry season, water is released from Mwenje dam.

3.2 3.2 Climatic Conditions

Bindura Town has a humid subtropical, yet dry winter climate. Weather patterns are characterized by hot, humid summers and moderate yet dry winters. Throughout the year, Bindura experiences variations in temperature with the highest on average being 30.5°C in October and the coolest at roughly 21.8°C during July. The lowest average temperature is usually experienced in July as well at 8.3°C, while the warmest night temperatures occur in February and December with approximately 17.4°C (see also Table 3.1 and Figure 3.1).

Most of the precipitation is received in the months of December; January, February and March. Rainfall shows a clear pattern with the highest recorded at 151mm in January; dropping gradually to a minimum of about 1mm from June through September. This shift in precipitation is reflected in the number of rainfall days as well, reaching a 24.4-day peak in January and reducing to as low as 1.2 days in September. Concurrently, sunshine hours exhibit an inverse trend, starting with 5.5 days in January and peaking at 28.9 days in August. Notably,

the town also experiences changes in wind speeds, ranging from 8.2km/h to 11.5km/h, with the windiest period occurring from July to October.

3.3 Vegetation

Vegetation in Bindura is dominated by msasa-mnondo woodlands on granite soils and Msasa-mpfuti woodlands also on granite soils. Muunze woodlands (Acacia woodlands) are common on the hills and occur on gold belt soils. In the low lying areas vlei grasslands are common, with Mukute trees occurring mostly on the fringes of the vleis. The Mubvukate tree is common on the bottom slopes of dwalas. The other common trees are the Murima tree, Mucherekese tree, Chitatsunga tree and the Muora tree. The Figtree (Muwonde) is a common tree as well.

3.4 Geology and Soils

Bindura is situated in the greenstone belt which is associated with gold, nickel and iron ore deposits. Most of the land within the town council boundary is on a granite intrusion characteristic of metamorphic and igneous rocks which emanate from later intrusions. Also common are dolomites, meta-sediments and sedimentary rocks. Dykes, which are zones of weakness occur in some parts of the planning area. As a result of the occurrence of these rock types both within and outside the Town Council boundary, land for future development is not readily available as most of it is physical constrained, with most of it under mine claims.

Greenstone are associated with red soils, and therefore most of the land within and outside Bindura has red soils which are ideal for agricultural purposes. However, the soil types that are mainly found in Bindura are deep reddish brown to greyish brown. These soils are silty, sandy loams and clay loams which cover most of the town council area. The southern part of the Town Council Area and adjoining farms are covered by moderately deep to deep reddish brown granular clay formed on metamorphic rocks. Part of the land within the council boundary to the southwest is on shallow greyish brown course grained sands.

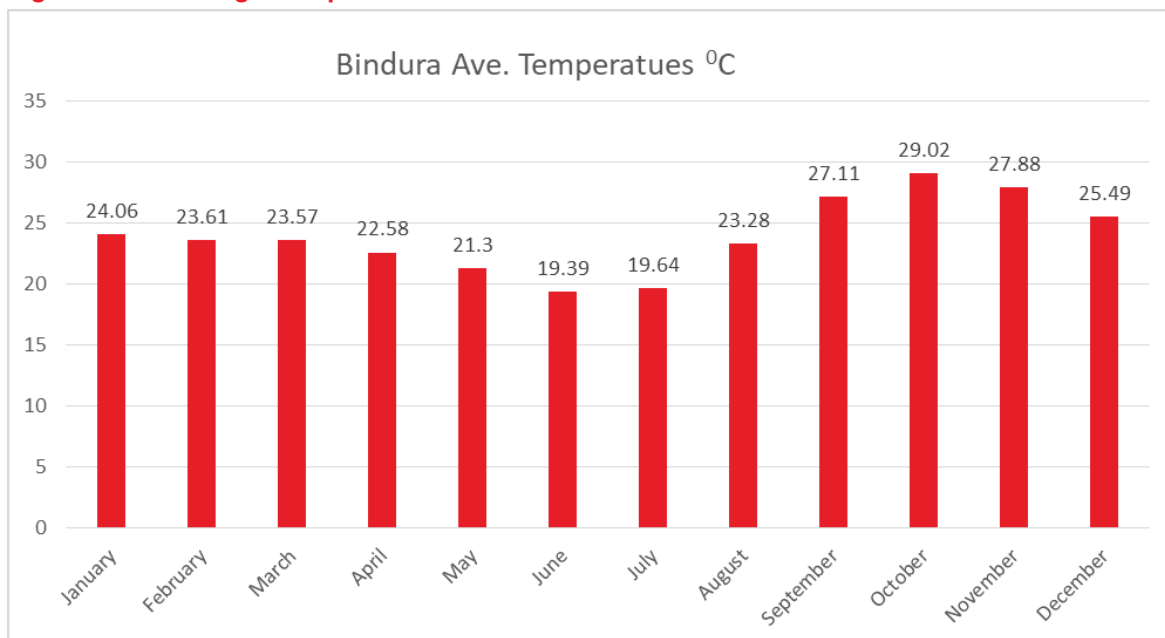
Table 3-1: Average Monthly Precipitation and Average Monthly Temperature

Month	Ave Precipitation(mm)	Ave. Temperatures °C
January	406.59	24.06
February	325.37	23.61
March	187.73	23.57
April	61.69cl	22.58
May	10.63	21.3
June	2.12	19.39
July	1.65	19.64

August	0.47	23.28
September	0.48	27.11
October	19.54	29.02
November	143.09	27.88
December	312.37	25.49

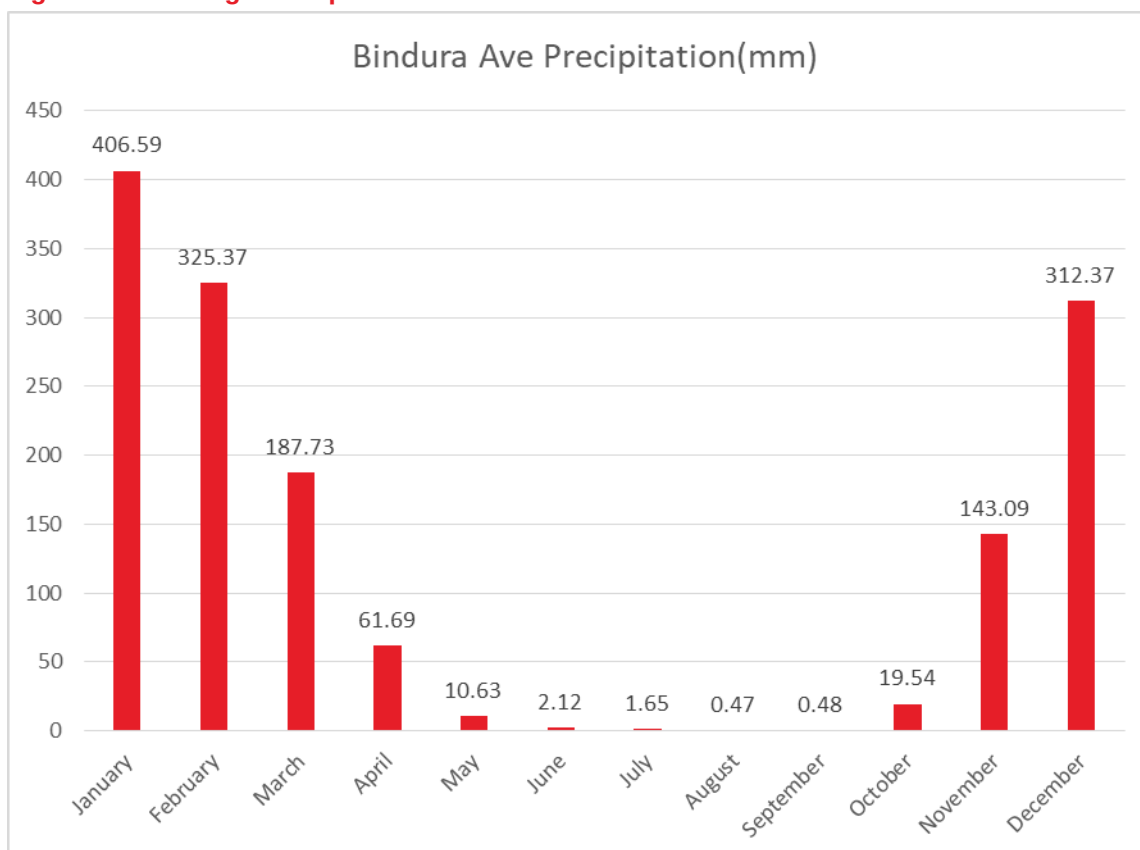
Source:<https://weatherandclimate.com/zimbabwe/mashonaland-central/bindura>

Figure 3-4:: Average Temperature for Bindura Town



Source:<https://weatherandclimate.com/zimbabwe/mashonaland-central/bindura>

Figure 3-5: Average Precipitation Bindura Town



3.5 Critical Planning Issues

- The mountainous nature of part of the terrain acts as a major constraint to the development of Bindura. For a start, the mountain range to the south of Bindura Town is under mine claims. The combined nature of the mountain range and the existence of mine claims makes the land unavailable for urban development.
- The mountainous range to the north-west acts as a major constraint in terms of the type of land uses that can be promoted. In fact, the trend has been to zone such land for low density residential development, with sewer on septic tanks and soak-away. Yet; servicing for water provision is difficult in such a terrain, and hence settlements are largely without Municipal water.
- With Bindura Town located in a high-rainfall region, the need for bus shelter at the Chipadze Main Bus Terminus and shelter at the Bindura Main Vegetable Market is quite evident. It is therefore important for the Municipality of Bindura Town to provide adequate shelter at those two places in order to minimise exposure to unfavourable weather conditions.
- Further, high rainfall patterns generate high volumes of surface runoff. Hazards associated with flooding of the low-lying areas are expected to be common in the town. Water accumulating in the abandoned mining pits have the potential to act as breeding ground for mosquitoes.
- The rich soils in parts of Bindura Town provide a critical resource for use as agro-residential land-uses.

Chapter 4 : Overview of the Built Environment and Major Economic Nodes

This chapter presents an overview of the built-up environment and the major economic nodes that drive the economy of Bindura Town. It starts with a characterization of the Central Business District (CBD) and the suburban shopping centres in the rest of Bindura Town. Thereafter, the chapter delves into other economic nodes such as industry and tertiary institutions. Specific details on mining companies are presented in Chapter 7. A tabulation of the economic nodes is shown in Table 4.1.

Table 4-1: A tabulation of the Economic Nodes of Bindura Town

Type of Economic Nodes	Functionality
Central Business District	Gross Area of.... Retailing Centres with major supermarkets Office and Administrative functions Financial Centre Specialized Services
Industry	Gross Area of ... Employment Centre for the Town Provision of services and goods for Bindura Town and beyond
Bindura Main Vegetable Market	Location: Chipadze Township Area: 2 408 square metres Operators: 63 registered owners Goods sold: Fruits and Vegetables, dried cereals and legumes, herbs and spices
Chipadze Main Bus Terminus	Area; 9995 square metres Parking Bays: 4 x 50m long Loading Bays Type of Traffic handled: Inter City Buses; Commuter Omnibuses, Cross border buses
Bindura University of Science Education	Established in 1996 Located on land measuring...Ha Enrolment: 7000 students Employment: 300-399 academic staff plus non-academic staff Disposable income for students Student requirements for accommodation and commercial services

Zimbabwe Ezekiel Guti University	Located on 500 Ha of land First Enrolment: 2018 Enrolment: Less than 2000 students Disposable income for students Student requirements for accommodation and commercial services
Bindura Nickel Corporation (Trojan Mine)	First Nickel Deposit discovered in 1956 BNC operates a mine; and a smelter and refinery Following a plunge in nickel prices; operations closed in 2008, only to reopen in 2012. Employs some 1100 people
Fredda Rebecca Mine	Gold mining started in 1987 Mine claims occupying 5009 hectares of land Centre for employments for Bindura citizens; currently employs 849 people Accommodation and commercial services provided in Bindura Town; company owns 89 houses in various parts of Bindura Town. Hires out services to 16 other companies in areas such as loading and hauling; tails storage management; explosive supply; food catering, security etc. etc.
Ran Mine	Started operations in 1949 Company has 40 mine claims, on 365 Ha Employs 27 skilled and 63 unskilled workers Accommodation and commercial services provided in Bindura Town

Source: Author Compilations from Different Sources

It is the economic nodes that drive the development agenda of Bindura Town. Whilst residential areas do not constitute an economic node per se; they represent a critical catalyst that support all the economic nodes. Map 4.1 shows the location of economic nodes in the town. In essence, the New Master Plan must speak to the functional requirements of these key economic nodes; inclusive of the space and service requirements.

4.1 Background that Explains Bindura Urban Form and Structure

The form of Urban Cities is largely shaped by transport infrastructure, such as roads, transit systems, or simply walkways. Since each city is unique in the spatial and temporal process of development, there is a wide variety of urban forms and spatial structures. For a start; urban form refers to the spatial footprint of the urban transportation system whereas urban structure refers to the relationships arising out of the urban form.

Considering transport network developments, the urban spatial structure can be considered by its level of centralization and clustering, with:

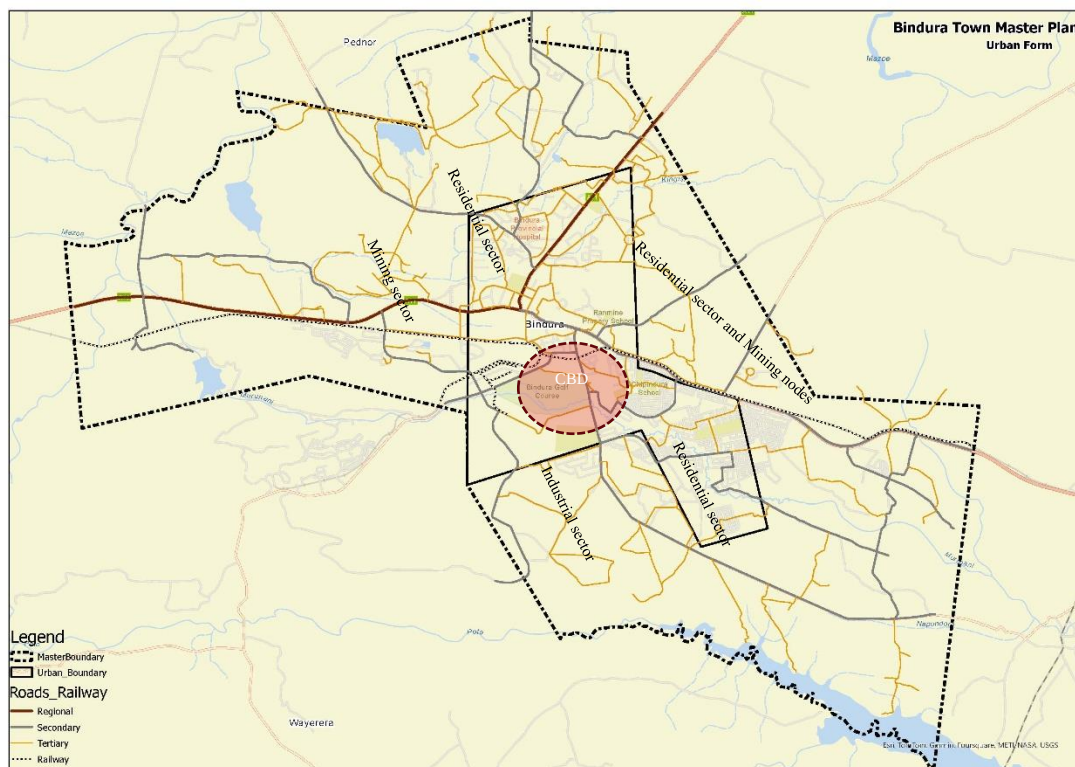
- **Centralization** referring to the locational setting of activities in relation to the whole urban area. A centralized city has a significant share of its activities within a defined center, while a decentralized city does to a lesser extent. Large employers such as financial institutions are the main drivers of centralization and
- **Clustering** referring to the locational setting of activities in relation to a specific part of the urban area. A cluster of activities is, therefore, a concentration around a specific focal point, such as a highway, railway lines, interchange, a transit terminal, or smaller centres that have been absorbed by the expansion of bigger centres.

Given the fact that cities vary considerably, the urban form and spatial structure of cities has two critical elements; namely nodes and linkages.

- **Nodes** refer urban activities like employment centres, residential areas or terminal facilities like bus termini and retailing centres in their different hierarchies.
- **Linkages** refer to the infrastructures supporting mobility between nodes like streets and railways in their different hierarchies.

The above framework assists us in understanding and describing Bindura Urban form and structure (*See Figure 4.1).

Figure 4-1: Structure and Form Bindura Town



What is evident from Figure is that Bindura urban form is fairly complex with a central Commercial business District (CBD). Out of the node, there are major arterial roads (Harare-Shamva Road, Bindura Mt Darwin Road and Bindura Masembura Road) which are radial. Below the national roads are series of curvilinear road networks linking the various residential, industrial, educational and mining nodes, ranging from distributor roads to access roads. Linked to the road systems are major activity nodes like mine complexes, high density, low density and medium density residential areas, educational nodes (ZEGU, BUSE campuses) and industrial areas.

4.2 Functions and Structure of the CBD and suburban Shopping Centres

From the 1996 Operative Master Plan, there was 2.5 ha of undeveloped stands in the CBD. The affected stands were stand numbers 2; 3, 4; 11; 58; 59, 60; 61 and 310. Currently, two stands remained undeveloped, namely Stands 2 and 11; while Stand 4 was only developed to a slab level.

Figures 4.2 and 4.3 illustrate the aerial view of the Central Business District; showing clearly the street patterns and the utilisation of horizontal space. Table 4.2 shows the detailed activities that are housed in the Central Business District. Some of the major supermarkets in the country have operations in Bindura, but direct observations of the facilities noted congestion in the

main supermarkets. Clearly, there is need for more facilities for major supermarkets. There is a good representation of the financial sector; filling stations, medical facilities and hardware shops. The Bus Rank that is located in the vicinity of the TM area does not have shelter to protect commuters from adverse weather conditions, especially heat waves and torrential rains.

Table 4-2: Activities in the CBD

Activity	List of Organizations involved in the Activity
1. Major Super-Markets	OK, TM, CHOPPIES, Masamvu, Simrac, N Richards, Metro Peech,
2. Financial Institutions	ZB bank, CBZ, POSB, Bank ABC, Ecobank, NMB, AFC, First Capital
3. Filling Stations	DA, Stadic, Glow, Petrotrade, Puma, Zuva, Cranrid, Energy Park,
4. Medical Facilities	Shashi Private Hospital, Delyn Pharmacy, Best Zone Pharmacy, Ponai Hospital, Bindura 24 medical Centre, Mediwise Pharmacy
5. Hardware Shops	Farm and City, Pees Hardware, Munya Instant, Big Catch, SaveChem, Bless Book Hardware, Maycom Hardware
6. Hotels	Kimberly Reefs, Coach House Inn,
7. Restaurants	2M, Meat Grill, Meat Retreat, Chicken Inn, Chicken Matty, Rossella Chicken
8. Government Buildings	Mutungagore GOVT Composite Offices, Kuvaka GOVT Complex, Ndoda Hondo GVT Complex, Vet offices, DA Offices
9. Estate Agents	Northside Estate Agents, Group Approach Estate Agents,
10. Lawyers	Maringe Legal Practitioners, Kajokoto Legal Practitioners, Gumbo Legal Practitioners
11. (Other activities)	
12. Bus Terminus	TM area Bus Rank
13. Car sales	Delyn Car Sales

Source: Compiled by the Municipality of Bindura 2024

There are many other diverse economic activities located in the CBD. The inventory includes the following:

- a) Backyard panel Beating
- b) Retail shops
- c) Furniture shops
- d) Clothing shops
- e) Boutiques

- f) Tailoring shops
- g) Indoor flea markets
- h) Photocopying and printing services
- i) Library;
- j) BUSE Social Sciences Campus; and
- k) Backyard Car Mechanics

Table 4.3 shows other shopping centres that service respective locations of Bindura Town. Significant changes have since happened since 1996 when the current Master Plan was put in place. For instance; there were no commercial facilities in the low density area compared to the current situation as shown in Table 4.3.

Table 4-3: Inventory of other sub-urban shopping centres in Bindura Town

Name of Shopping Centre	Location	Main Activities at the Shopping Centre
Chipadze shopping centre	Chipadze Township	Groceries, butcheries, stationery, printing, night clubs, sports bars, restaurants, Chipadze Clinic, Community Hall,
Aerodrome Shopping Centre	Aerodrome Chipadze Township	Groceries, butcheries, stationery, printing, night clubs, sports bars, restaurants, pharmacy, hardware shops, Car washes
Chiwaridzo 1 Shopping Centre	Chiwaridzo 1 Chipadze Township	Groceries, butcheries, stationery, printing, night clubs, sports bars, restaurants, pharmacy, Community Hall, Chiwaridzo Clinic, Shopping Mall
Chiwaridzo 2 Shopping Centre	Chiwaridzo 2 Chipadze Township	Groceries, butcheries, hardwares, stationery, printing, night clubs, sports bars, restaurants, pharmacy, Car washes
Chiwaridzo 2 Corner shops (Mupandenyama and Marimira)	Chiwaridzo 2 Chipadze Township	Groceries, bottle stores, Butcheries,
Chipindura Park Shopping Centre	Chipindura Park	Grocery, stationery, printing, night clubs, sports bars, restaurants, pharmacy, service station,
Prison Area Shopping Centre,	Low Density	Grocery Shops, pharmacy, Bottle store
Shashi View Shopping Centre	Shashi View	Grocery shops, Night Clubs
Woodbrook Shopping Centre	woodbrook	Groceries, butcheries, stationery, printing, night clubs, sports bars, restaurants, pharmacy, surgery, hardwares, Car washes

Source: Bindura Municipality Records, June 2024

Figure 4-2: Figures 4.2 and 4.3: Aerial View of the Central Business District





4.3 Other Economic Nodes

There are several establishments that act as economic nodes in Bindura Town. The foregoing section has already provided details on the Central Business District. Other economic nodes include the town's industrial sector; the two universities that exist in the town and parastatal organizations that include the National Railways of Zimbabwe and the Grain Marketing Board. Chapter presents materials on the mining sector and SME activities that exist in the town.

4.3.1 Tertiary Education Facilities as Economic Nodes

Bindura Town is home to the Bindura University of Science Education (BUSE) and the Zimbabwe Ezekiel Guti University (ZEGU).

Opened in the year, ZEGU is located on a 500 ha piece of land allocated through the Ministry of Local Government. Table 4.4 shows student enrolment for the years 2018 -2023. Whilst the University has on-campus Halls of Residences for male and female students, the capacity is limited and cannot accommodate all students. As such, the majority of students reside in the surrounding suburbs of Chiwaridzo and Aerodrome, and boarding houses located in..... In terms of water provision, the University relies on several boreholes around the campus which supplement the otherwise erratic Bindura Municipality water supply. It also relies on a system of septic tanks for sewer services, and the Bindura Town Municipality is responsible for their emptying when full. The University has a clinic and a tuck shop on the campus site. Additionally, students have access to shops, pharmacies and clinic in the surrounding suburbs and in the Bindura CBD.

Table 4-4: Student Enrolment at ZEGU 2018-2023

Year	New Students Per Year	Total Enrolment per Year
2018	439	1077
2019	418	1776
2020	265	1956
2021	367	2199
2022	187	2110
2023	274	1873
Totals		

Source: Zimbabwe Ezekiel Guti University Records; May 2024

University Education as provided for by BUSE and ZEGU constitute a key economic node for Bindura Town. By and large, the student population relies on Bindura Town for commercial and health services. Also, the accommodation needs of students largely relies on residential accommodation in Bindura Town. As an illustration, a new phenomenon of boarding houses have emerged in the town, housing the student population. Further, the planning for Bindura Town has to take into account of student needs. It can be anticipated that the character of land uses surrounding universities will eventually change in a manner that will seek to service the student population. Thus, land uses will likely change to service the residential needs of the population, while food outlets are likely to sprout in such areas.

Founded in 1996, the Bindura University of Science Education operates from five campus sites in Bindura Town (It also has a branch campus in Harare). The five are:

- Main Campus, corner Mt Darwin Road and University Road, on 210 ha of land; established in 2013
- Astra Campus, along Trojan Road in the heavy industrial area, on 2.23ha; established in 2003
- Town Campus, along Railway Avenue in the CBD, on 0.75 ha; established 2013
- School of Health Sciences Campus, Lot 3 Hay Road, Shashi; on 2.02 ha; established in 2015
- Hugh Gundry Road Student Residence; Hugh Gundry Road; Greenhill, on 5.13 ha, established in 2005.

In addition, BUSE is leasing the Public Service Training Bureau Centre along Arthestone Road, on 10.72 ha of land. The site was established in 1996.

The University has a range of about 300-399 academic employees (Faculty); <https://www.google.com/url?sa> (downloaded 6 June 2024). In general; and for a very long time, the University has an acute shortage of on campus accommodation. With a total student population estimated at over 7000 students, the institution can only accommodate less than 400 students on campus, leaving the rest of the students to be accommodated off campus. This has exposed students to negative vices of the society. In fact, currently BUSE has an enrolment of 7121 students, with 700 of these in residence at the Main Campus and 150 at the Public Service Training Bureau. The rest of the students; about 6271 of them, are housed in Boarding Houses in Bindura Town.

It is notable that BUSE houses the National Sports Academy as mandated by the Government in 2005. “The major thrust of the academy is mainly hinged upon the identification and nurturing of local sports talent to acceptable local and international standards. The Academy is at its early stages of development and does not have the requisite infrastructure in place to enable it to attain its objectives. There is need to construct sports facilities for various disciplines ranging from soccer, judo, badminton, karate, athletics, etc. The University kindly requests for partnership in the construction of the aforementioned facilities;” (<https://www.buse.ac.zw/fundraising>).

During consultations, some stakeholders made the observations that recreational facilities were lacking in Bindura Town, and thereby prejudicing the youth who are talented in requests. A request was made for the Municipality of Bindura to provide recreational facilities. There is space for the Bindura Municipality to partner up with BUSE in providing recreational facilities since

4.3.2 Industry in Bindura Town

The industrial zone is located to the south of the railway reserve and to the south –east of the town centre. In general, Bindura Town has a limited industrial base. Table 4.5 shows the types of light industries that exist in the town, servicing key sectors such as mining, food industry, construction; mechanical engineering and manufacturing.

Table 4-5: Inventory of Industries in Bindura Town

No.	Name of Company	Area of Operation
1	Chilmund Pvt Ltd	Water Chemicals manufacturing
2	Tongui Pvt Ltd	Manganese smelting and refinery
3	Superfert FSG Pvt Ltd	Fertiliser Manufacturing
4	ZESA Workshops	National Power Supply
5	CMED workshop	Government Vehicles Servicing
6	Forit Pvt Ltd	Concrete products and quarries
7	Rumike Pvt Ltd	Mechanical Engineering
8	Adult Millers	Grain milling
9	Delta Beverages	Beer and Soft Drinks Retailing
10	NRZ	Railway Transport
11	Doves Morgan Funeral Parlour	Funeral Services

12	GMB Depot	Grain Marketing
13	Conrock Pvt Ltd	Concrete products and bricks
14	Zuva Petroleum Depot.	Fuel Retailing

Source: Bindura Municipality Records, June 2024

4.3.3 Botha Mine Claim

Botha Mine is an important economic node for Bindura Town, operating under artisanal miners. The activities of artisanal miners are supported by other downstream activities such as transport for ferrying ore to the millers; tuck-shops that supply basic commodities and vendors who supply food to the miners.

4.4 Critical Planning Issues

- Densification of land uses is long over-due in Bindura Town. Critical sections of the CBD may require re-planning and redevelopment with a focus towards increased building heights. The Floor Area Ratio (FAR) is a tool that needs to be used to control building bulk, traffic density, and infrastructure demands in the CBD. As a planning tool, it ultimately controls how much area a building can occupy relative to the underlying plot of land. It is important for Bindura Municipality to regulate the Floor Area Ratio through; for instance; zoning restrictions.
- The Central Business District lacks civic spaces as in planned physical spaces which enable citizens to come together for multiple purposes, inclusive of sharing their interests and concerns, and acting to influence and shape their communities.
- Each of the respective nodes as outlined in this Chapter and elsewhere in the report has specific needs in terms of, among other issues; space requirements (e.g. for expansion) and service requirements; which the New Bindura Master Plan and ultimately Bindura Municipality has to attend to. The connectivity of the economic nodes and their harmonious existence are key areas that must be negotiated via the functionality of the New Master Plan.
- Equally important are the expansion and growth requirements of the respective economic needs, and the need for adequate residential spaces for housing the working population
- Also, the Master Plan has to create space for even more diversified economic nodes to evolve and be sustained in Bindura Town.

Chapter 5 : Land Use, Land Ownership and Land Utilization

This Chapter presents materials on land use and land ownership in Bindura Town. It further lays out land earmarked for the future development of the town. The dominant land use in Bindura Town, as is common in most towns and cities; are residential land uses. Mining and land under mine claims represent another dominant land use in the town. The CBD; already discussed in Chapter 4, is quite significant as it provides the much needed commercial services to Bindura Town and its hinder-land. Industry, especially light industry also occupies significant space in the town.

5.1 Overview of Land Use and Land Ownership in Bindura Town

Table 5.1 illustrates the distribution of land uses within the municipal boundary. As expected; residential land-uses occupy the biggest portion of 757 hectares, representing 38 % of the total area; followed by road infrastructure with 306 hectares, constituting 16% of total area. Institutional; open space and industrial uses occupy 16%; 6.3% and 5% in that order. A graphic representation of the same data is shown in Figure 5.1.

Table 5-1: Distribution of Land-uses in the Municipal Boundary

Land-use Coverage	Area (HA)	Percentage
Cemetery	10.82451	0.542086
Commercial	66.304	3.3204716
Industrial	99.56759	4.9862957
Institutional	311.5672	15.603131
Mine	128.1182	6.4160962
Undeveloped Wetlands	78.58576	3.935536
Open Space	127.3202	6.3761327
Recreational	99.2621	4.9709969
Residential	757.6971	37.945097
Railway	10.68075	0.5348865
Road	306.8974	15.36927
Total	1996.825	100

Source: Google Earth Calculations

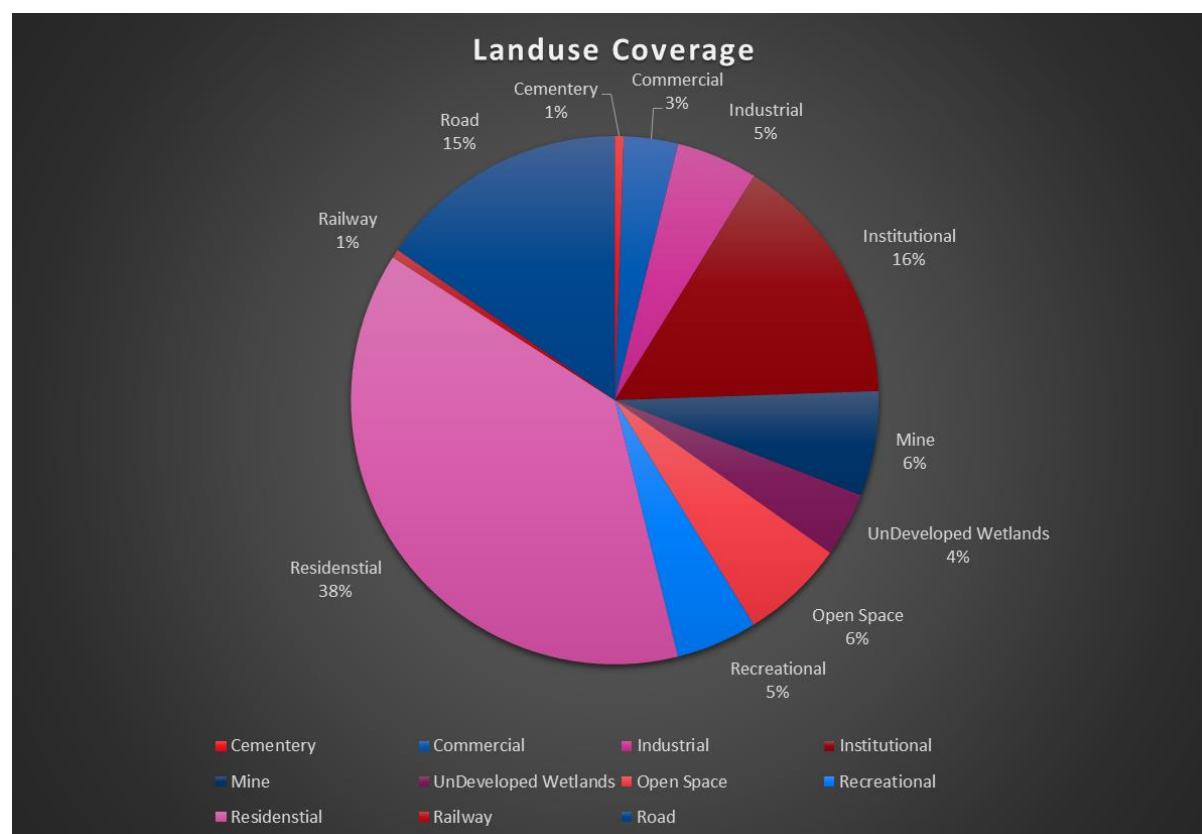
Based on the Valuation Roll, Bindura Municipality has an estimated 17 573 properties (stands and developed properties), occupying about 19 877 674 square metres of land (table 5.2 refers).

Table 5-2: Properties in Bindura Town based on the Valuation Roll

Area	Frequency (Stands/Buildings)	Area Covered (square metres)
CBD	281	1 321 952
Aerodrome	461	174 326
Low Density (others)	634	5 261 408
Claverhill	1 282	4 164 080
Greenhill	702	3 058 311
Morningside	66	70 296
Chiwaridzo	3 644	1 435 819
Chipadze	2 279	929 001
Woodbrook	4 352	1 883 481
Brockdale	3 872	1 579 000
Total	17 573	19,877,674

Source: Compiled from the Bindura Valuation Roll, May 2024

Figure 5-1: Distribution of Land Uses in the Municipal Boundary



The operative Bindura Master Plan occupies about 8600 ha of land. Of this land, only 1900 ha is technically under the administration of the Municipality of Bindura Town. This represents 22% of the total land under the Master Plan Boundary, with the rest as yet to be incorporated (see discussion in Chapter 1). In practice, the Bindura Municipality continues to lose rates accruing to the said land.

Figure 5.2 shows some of the vacant land that is available for CBD expansion. There are three sites earmarked for that purpose, as indicated in Figure 5.2.

Figure 5-2:: Current CBD and land available for Expansion



5.2 Land Use Conflicts in Bindura Town

Mine claims are at the centre of land use conflicts in Bindura Town. Figures 5.3 and 5.4 show the conflicts between low density residential development to the South of Bindura Town and the Trojan Mine Claims. Discussions with officials of Bindura Municipality confirmed that some houses have already been constructed in areas where there are mining claims. Figure 5.5 illustrates land with mine claims which was zoned for the future expansion for the CBD. Yet, one of the claims known as Botha Mining Claim is operative, with artisanal miners operating from that claim. Additionally, some of the land with mine claims; though no longer active; has widespread un-rehabilitated pits that makes the land unavailable for development (see also discussion in Chapter 7). Kimberly State lands, zoned for residential development under the 1996 Master Plan, became unavailable for development as discussed in Chapter 1 and Chapter 8. From Table 5.3, Kimberly Statelands has a total area of 34 mine claims, occupying 278 ha of land.

Table 5-3: Distribution of Mine Claims by Property in the Bindura Master Plan Land

Regions	Area	Number
Woodbrook	330	30
Shashi	72	20
Sangere	6	1
Otterburn	76	4
Manna Crest Estate	6	1
Long Acres	116	7
Kippendale	264	6
Kingston	221	7
Kimberly Stateland	278	34
Insingisi	6	1
Insingisi Estate	597	35
Hildadale	117	2
Greenhill	59	3
Freda Rebecca Mine	44	8
ClaverHill	45	5
Burnside Estate	29	2
Batanai	7	1
Ballantrae	181	2
Atherstone	97	11
Total	2552	180

Source: Original Data from Ministry of Mines

Figure 5-3: Trojan Mine Claims and Residential Developments

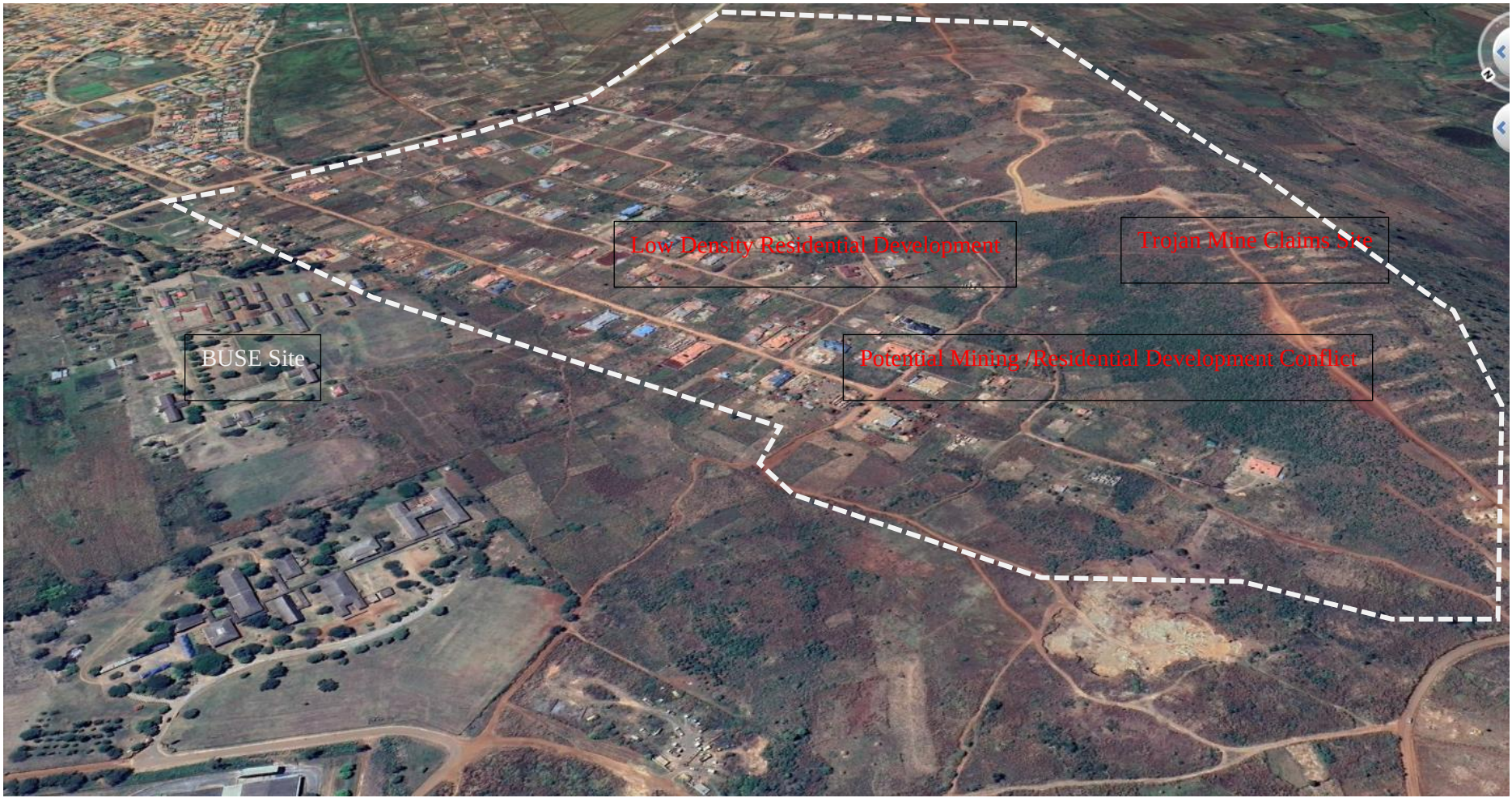


Figure 5-4: Trojan Mine Claims and Residential Developments

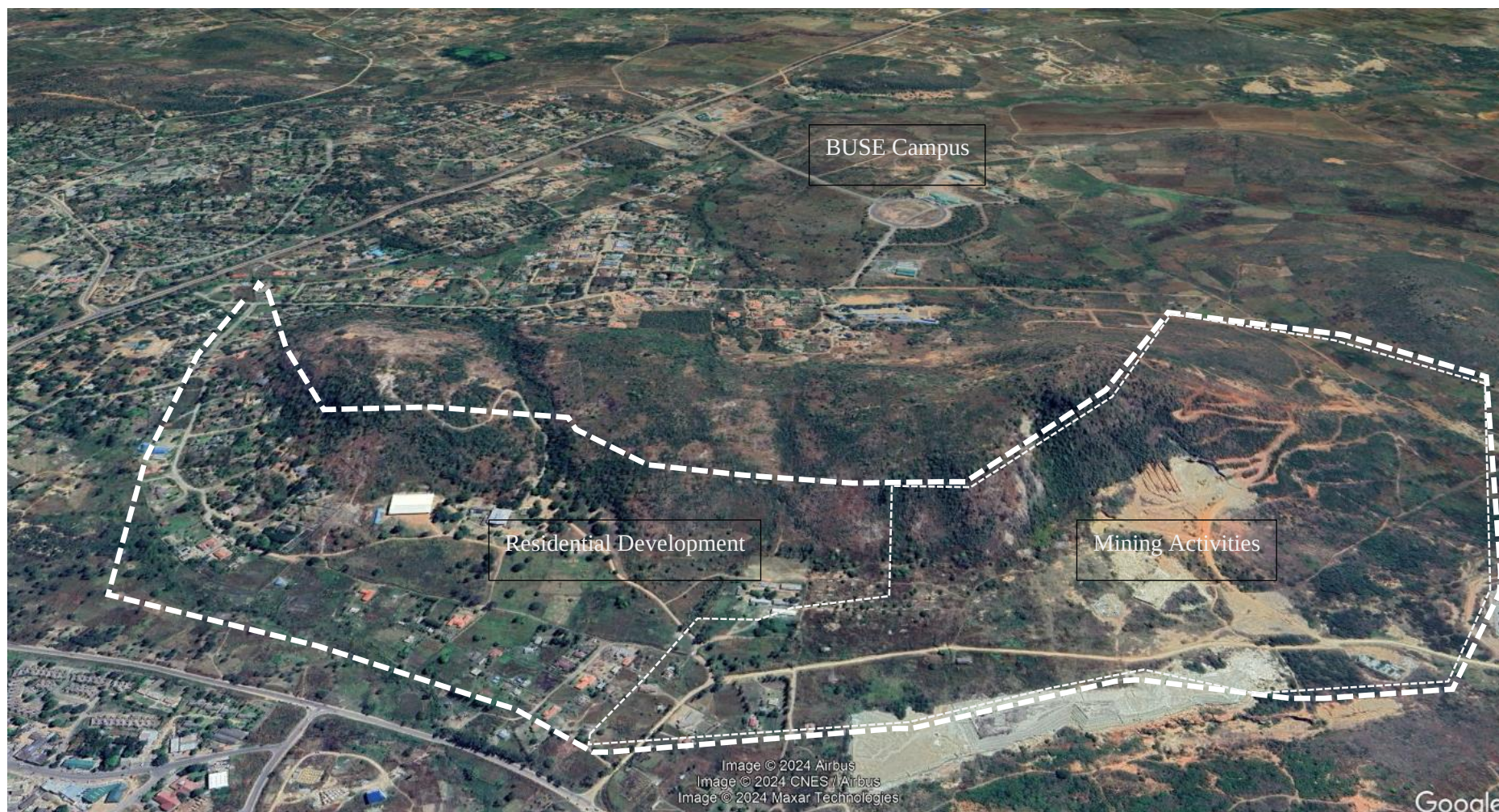
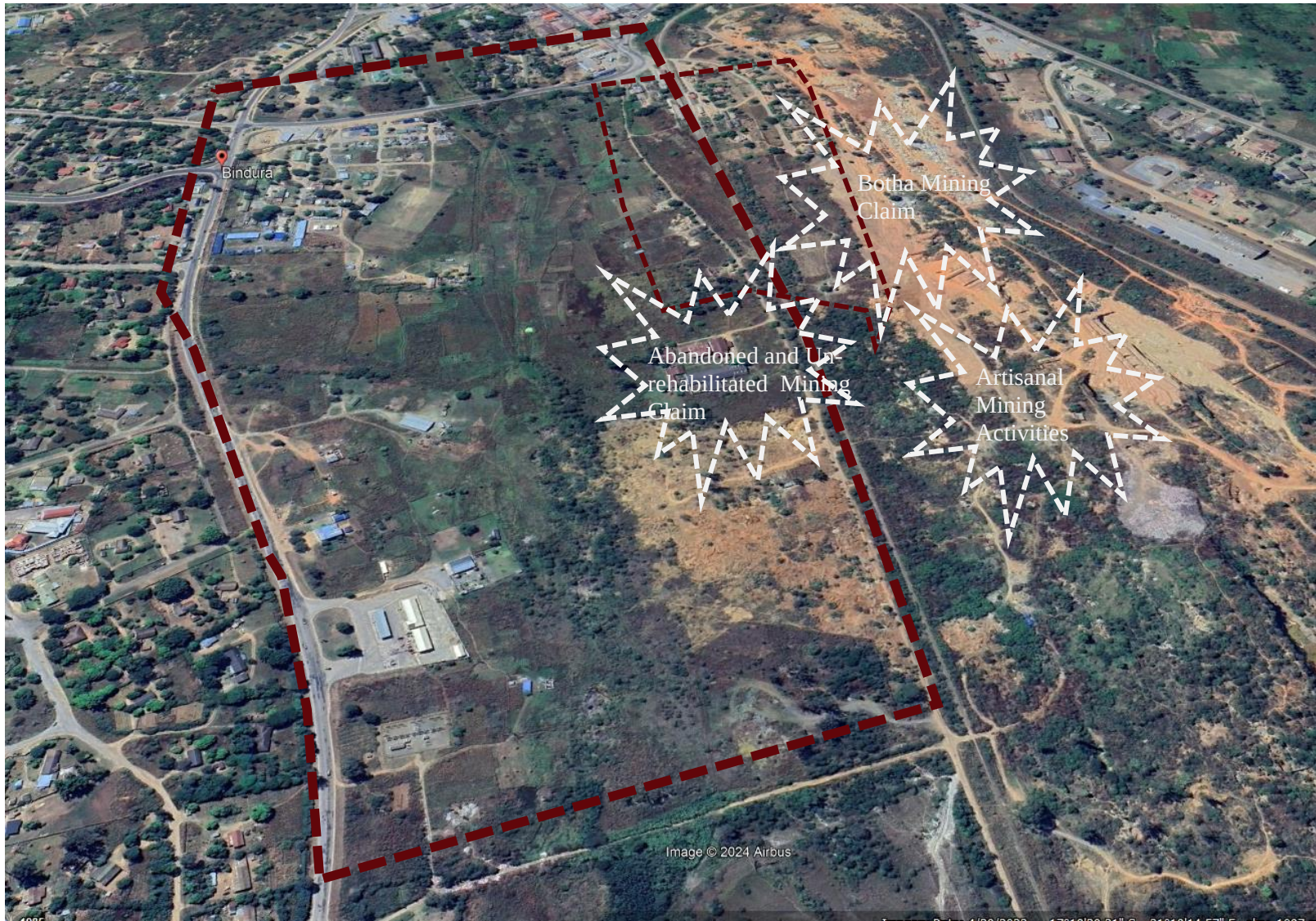


Figure 5-5: Mine Claims that are Inhibiting Expansion of the CBD



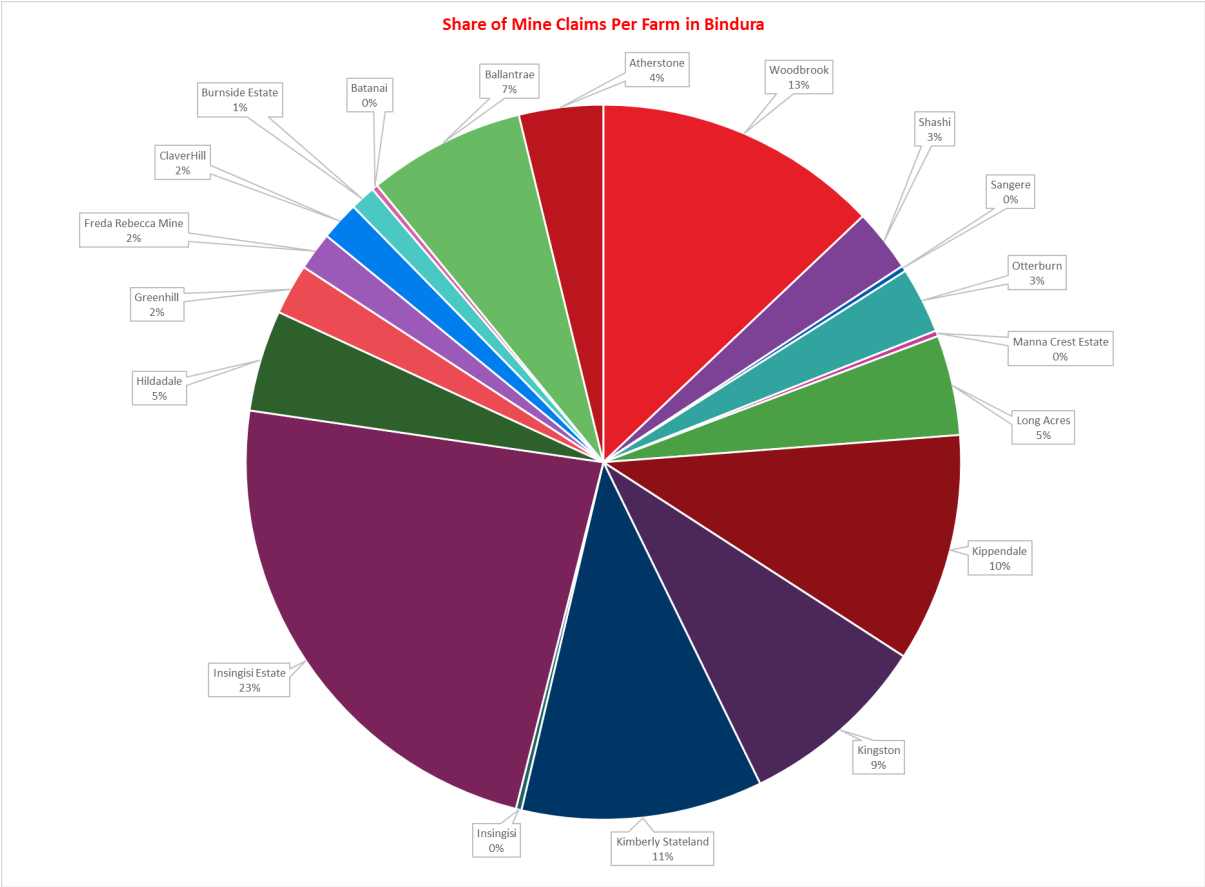
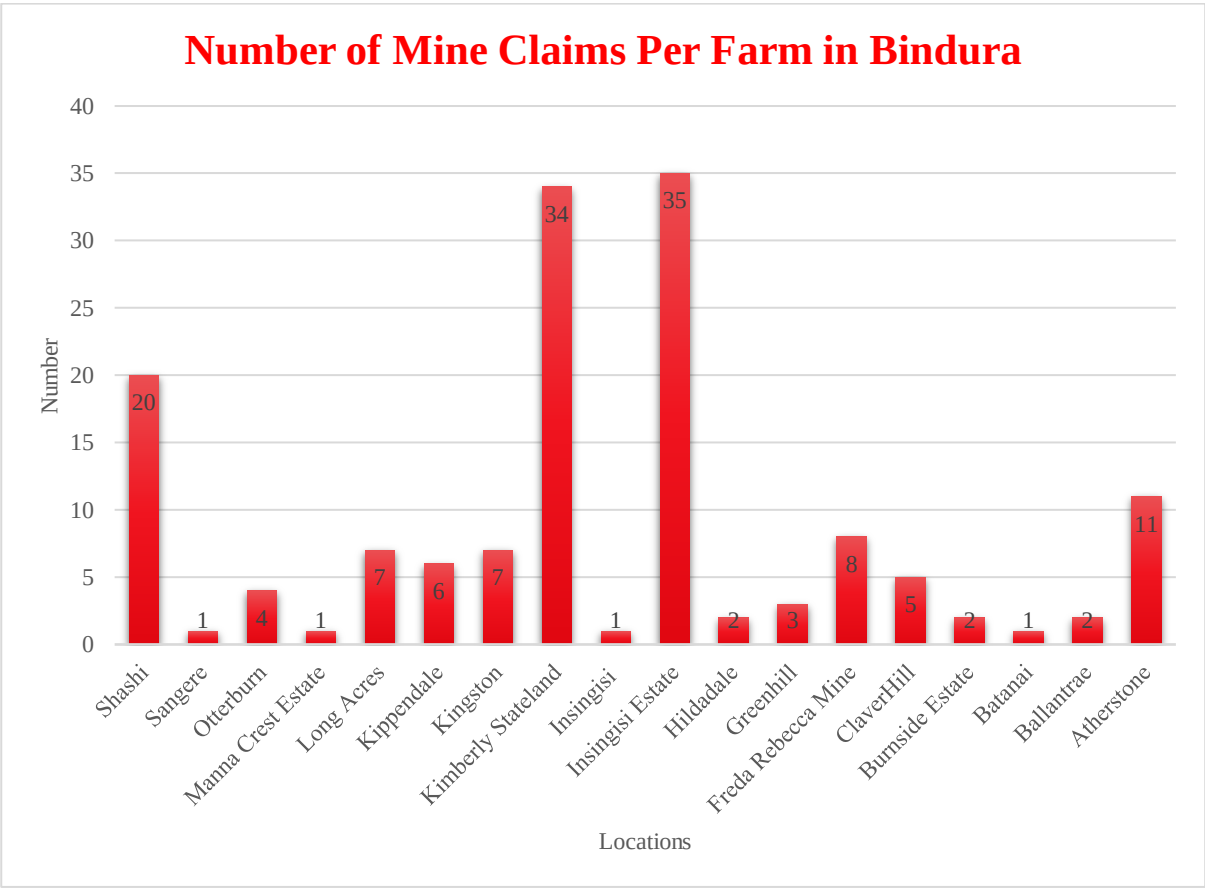


Figure 5-6: and Figure 5-7: Distribution of Mine Claims by Farm in Bindura Town



5.3 Land Available for Development

From the 1996 Master Plan, Kimberly farm had been earmarked for future residential development. However; this did not happen as result of a high number of active mining claims on the land. In addition, about 500 hectares was allocated to the Zimbabwe Ezekiel Guti University. Also; Insingizi Estate, measuring 1435.7742 south of the Harare-Bindura Road; was reserved for general industrial activities; targeting pollution-free and bulk storage activities. No development was effected on the stated farm and agricultural activities are still ongoing. The farm is under A2 farming, on an Offer Letter, and is available for development. Based on the 1996 Master Plan, Bindura had some 1888.51 hectares under its jurisdiction, with the Municipality owning about 1578.12 representing 84% of total land. This figure has not changed, although vacant land is almost exhausted.

Botha Mine Claim; which had been zoned for CBD expansion; remained under active mining. That portion can only be available for development if the active mine claim is decommissioned.

From Figure 5.2; the land indicated as No 1 Site for CBD Expansion, is available for development. This land measures. This also goes for No.3 Site, measuring about

Table 5.4 shows details of farms located inside the Master Plan boundary. A significant portion of the land is not available for urban development; with Sandazi, Mana Crescent and Dandazi under Freda Rebecca Mine Claims.

Table 5-4: Farms Surrounding Bindura Town inside the Current Master Plan

Number	Name of Farm	Area (Ha)	Land Use	Availability for Urban Expansion
1.	Sengere		A2 Farm	
2.	Kingstone	670.630	Peri-urban farming	
3.	Dandazi	482	Freda Rebecca Mine	
4.	Kipendale	623.900	Commercial farming; indigenously owned	
5.	Sandazi		Freda Rebecca Mine	
6.	Mana Crescent	482.00	Freda Rebecca Mine	
7.	Insingizi EState	1435.7742	A2 Farm	
8.	Woodbrook		Residential	
9.	Kimberly State land		Part given to i. Zimbabwe Ezekiel Guti University (500 ha) ii. Bindura University of Science Education	
10.	Greenhill		Residential	
11	Cleverhill			

Source: Bindura Municipality Records May 2024

As a result of shortage of land available for urban expansion, Bindura may have to look for land outside the existing Master Plan Boundary. Table 5.5 shows specific farms that Bindura Municipality seeks to acquire under the New Master Plan.

Table 5.6 provides details of the broader context of farms that surround Bindura Town. The expectation is that any expansion of Bindura Town will be at the expense of some of these properties. It is worth noting that a farm like Balantre has been subdivided and there are advanced plans for one of the subdivisions to be transformed into a residential layout plan; catering for medium and low density residential stands.

Table 5-5: Farms Surrounding Bindura Targeted for Bindura Town Expansion

No	Name of Farm	Area (Ha)	Current Land Use
1	Melfort	554.170	A2 Farm
2.	Athlone	405.990	A2 Farm
3	Rapids	423.120	A2 Farm
4.	Ballantre	209.574	Commercial Farming (private)
5.	Melfort Extension	103.09	A2 Farm
6.	Stella	425.690	A2 Farm
7.	Barassie	1 300	Peri-urban farming
8.	Lot 1 of Barassie	-	Commercial Farming (private)
9.	Lilburn	-	A1 Farm
10.	Otterburn	1430.00	Mining
11.	Burnside	350.4320	Private
12	Avillion	1327.6030	A1 farming
13	Arundale	-	Private
14.	Hildadale	-	-

Source: Bindura Municipality Records May 2024

Table 5-6:: Farms surrounding Bindura Town

Farm Name	Date Settled	Model	Size (Ha)	No. of beneficiaries	Main activity	Tenure Rights
Avillion	2002	A1	1327	115	Crop & Livestock	Permits
Athlone	2003	A2	474.00	1	Crop & Livestock	Offer Letter
Claverhill South	2002	A2	649.360	5	Crop & Livestock	Offer Letter
Remainder of Claverhill	2002	A2	391.3345	6	Crop & Livestock	Offer Letters
Remainder of Barassie	2015	A2	1355.5190	40	Crop & Livestock	Offer Letter
Rapids	2002	A2	423.1199	5	Crop and Livestock	Offer Letter
Melfort	2017	A2	554.1700	2	Crop and Livestock	Offer Letter
Melfort Extension	2006	A2	103.0882	1	Crop & Livestock	Offer Letter

Balantre ¹		Indigenous	209.574	1	Crop and Livestock	Title Deeds
Kippendale		Indigenous	623.900	1	Crop and Livestock	Title Deeds
Burnside		Institution	350.4320	1	Mining	Offer Letters
Otterburn		Institution	1430	1	Mining	Offer Letter
Sengere		A2		1	Mining	Offer Letter
Kingstone	2011	A2	670.635	19	Crop & Livestock	Offer Letter
Dandazi		A2	482.00	1	Mining	Offer Letter
Insingizi Estate	2003	A2	1435.7742	2	Crop & Livestock	Offer Letter
Manna Crescent	2002	A2	482.00	1	Mining	Offer Letter
Stella	2003	A2	528.00	1	Crop & Livestock	Offer Letter

Source: Ministry of Lands Records; June 2024.

5.4 Critical Planning Issues

Bindura Town has run out of land for urban development. Future plans for urban development have to source land outside the existing Master Plan Boundary. It must be noted that some of the land are farms redistributed under the Fast Track Resettlement Programme and are predominantly under agricultural production. Any land acquisitions into the New Master Plan will trigger a new process of analyzing; if any, the existence or non-existence of mine claims on the targeted properties.

- Despite the centrality of mining as a critical base for the Bindura Town economy, the conflicts between mine claims and the requirements of urban development are both widespread and intensive. As discussed elsewhere in the report; the CBD could not expand because of the constraints presented by Botha Mine Claim. A more pragmatic approach is required in terms of managing the conflicts between mine claims and urban development.
- Chapter 8 further deliberates on how mining has made and continues to make land unavailable for development even long-after mining operations have ceased. Excavations, largely caused by open cast mining; have caused the mushrooming of un-rehabilitated pits deep inside Bindura Town. A strategy focusing on reclaiming excavated pits is required.

¹ The farm was officially subdivided into two properties measuring 129 ha and 80 ha. There are plans to turn the 129 ha property into a residential layout plan for an estimated 980 medium and low density residential stands.

- Land utilization in the CBD is largely below expected standards. Very few buildings in the CBD go up-to the Third Floor (see discussion in Chapter 4). Densification through increasing building heights and the floor area of buildings are critical strategies required in Bindura Town.
- The completion and approval of the New Master Plan will need to be followed by the incorporation of relevant properties into municipal land as directed by appropriate statutes. The process will have to start from relevant properties covered under the 1996 operative Master Plan.
- It is remarkable that some of the land earmarked for urban development is rich agricultural land. In order to ensure that some of the rich agricultural land is not entirely lost to urban development, the New Master Plan will propose zoning some of the land under agro-residential land uses.

Chapter 6 : The State of the Environment

Chapter 5 has presented evidence on the impacts of mining activities on the environment. It has shown how mining continues to contribute to the problem of un-rehabilitated excavations, making the impacted land unavailable for development. Other environmental problems associated with mining include deforestation, land degradation through gully development and polluted air and water quality. This chapter completes the discussion on the state of the environment in Bindura Town. It presents data on; among other things; pollution of water resources; impacts of development interventions on wetlands and challenges with solid wastes management.

6.1 An Overview of Environmental Issues in Bindura Town: the perspective of the Forestry Commission

The state of forests and the environment in general is seen as characterized by rapid deforestation caused mainly by mining, infrastructure development and agricultural expansion. The expansion of residential development is one of the biggest threat to indigenous forests. According to the Forestry Commission, there is serious deforestation and degradation of the environment in mining zones that include Ran Mine; Fredda Rebecca and Trojan Mine, as well as places where there is/ widespread illegal mining activities. Consequent to that; there are inadequate pollution buffers and carbon sinks and hence the need for plans to rehabilitate, restore and create pollution buffers and carbon sinks using compatible tree species (see discussion in section 6.5, this chapter).

Bindura Town is also an attractive market for timber and non-timber forest products. This has resulted in the influx of illegal forest products like timber, firewood, charcoal, artefacts and indigenous fruits. In view of that, the regulation of trade in forest products needs strong collaboration between the Bindura Municipality and the Forestry Commission in the licensing and control of the trade of forest products in areas like the Chipadze Market, Chiwaridzo, Aerodrome; Woodbrook and the main market.

6.2 The State of Wetlands

Bindura Town has a total of 18 sites classified as Mash Wetlands, and 136 sites classified as Vlei/Dambos, all of which occupy a combined area of 2 136 hectares of land (see Table 6.1 and Figure 6.1)). Figures 6.1 and 6.2 show the distribution of wetlands by neighbourhood.

There is evidence of encroachment of development activities even into areas classified as wetlands. From the Map on Wetlands (Map 6.1 refers), there has been encroachment of especially residential areas into areas classified as wetlands. This is not surprising as almost 70% of the wetlands are located in the residential areas. Similarly, almost 70% of the Mash sites are located in the residential areas.

Table 6.2 gives a detailed analysis of the extent of encroachments into areas that are designated as wetlands. From the data in Table 6.2, it appears clear that there are challenges with the designation of wetlands in urbanized areas. On the face of it; it would appear as if there is a widespread disregard of conditions related to the management of wetlands. Yet, at stake could be the difference in interpretation and the implications therefrom as applied by the Regional, Town and Country Planning Act on one hand; and the Environmental Management Act on the other hand. Following the preparation and approval of relevant layouts; and the subsequent stand allocations to home-seekers and other type of investors, developers had the right to develop the land as provided for by Section 26, Part V, of the RTCP Act. Whilst it is not clear what came first – designation of wetlands and the parcelling of land under the RTCP Act; it is evident developers took the opportunity to invest on the land and are at various stages of development. In functional terms, it does not appear as if there is a common definition of wetlands and the management implications that come with the definition. In situations where RTCP Act interventions (planning and allocation of stands) pre-existed the designation of wetlands, a legal challenge would emerge on the rights to undertake development for those allocated the stands. In brief, a policy discussion is required between the Ministry of Local Government (as the custodian of the RTCP Act) and the Ministry of Environment as the custodian of the EMA. This will pave the way for a common approach to the definition and management of wetlands.

Table 6-1: Area under Wetlands in Bindura Town

Wet Land Type	Area	Number
Riparian/Mash	1138.5933	18
Vlei/Dambo	998.50551	136
Totals		154

Source: EMA Data; May 2024

Table 6-2: Encroachment of Land Uses into Wetlands

Type of Wetland	No. of stands affected	Affected Land Use	Location	Area(Ha)
Vlei	1	Long Acres	Batanai	22.29004
Riparian	1005	Residential, Institution, Open Space, Wetland, Commercial	Brockdale	139.418
Vlei	73	Residential, Open Space, Industry, Commercial, Golf Course	Chipadze	103.93
Vlei	150	Residential, Open Space, Industry, Institution, Stadium, Commercial	Chipadze	26.87
Vlei	44	Residential, Industry	Chipindura	6.45
Vlei	53	Residential, Open Space	Chipindura	9.816
Riparian	1	Open Space	Chipindura	2.8
Vlei	83	Cemetery, Residential, Open Space, Wetland, Commercial	Chiwariidzo	10.13
Riparian	85	Residential, Wetland, Open Space	Chiwariidzo	16

Riparian	337	Residential, Institution, Commercial	Chiwaridzo 1	23
Vlei	325	Residential, Wetland	Chiwaridzo 2	57.757
Riparian	108	Residential, Wetland	Chiwaridzo 2	18
Vlei	312	Residential, Institutional, Commercial, Wetland, Cemetery	Chiwaridzo 3	32
	1	Hospital	Claverhill South	42.0079
Vlei	98	Residential, Institutional, Open Space, Mines	Ranmine	170.15
Vlei	1	Stateland	Ran mine	0.584
Vlei	71	Residential ,Open Space, Institution	Showground	42.0079
Riparian	37	Residential, Industry, Wetland, Garden Flats	Trojan	11.83
Riparian	3	Residential	Batanai	0.29
Riparian	17	Residential, Industry, Course	Chipadze	30
Riparian	15	Residential, Industry, Open Space	Chipadze	6
Riparian	32	Residential, Industry, Open Space	Chipindura	16.94
Vlei	14	Residential	Chipadze	0.71
Vlei	17	Residential, Institutional	Aerodrome	0.64
				789.6208

Source: Google Earth Calculations and Interpretation; June 2028

In a study of four wetlands in Bindura Town, Kadziya and Chikosha (2013)² showed that housing construction was taking place in the said wetlands. The study argued that housing construction was depleting the water table; while at the same time contributing to the pollution of underground water. Other impacts included habitat loss, construction of water diversion structures and the impairment of wetlands among others.

² Kadziya L and Chikosha F (2013); **Wetlands and Urban Growth in Bindura, Zimbabwe**; Greener Journal of Environment Management and Public Safety ISSN: 2354-2276 Vol. 2 (6), pp. 195-199, December 2013.

Figure 6-1: and Figure 6-2:: Wetlands Area and Distribution of Dambos by Neighbourhood

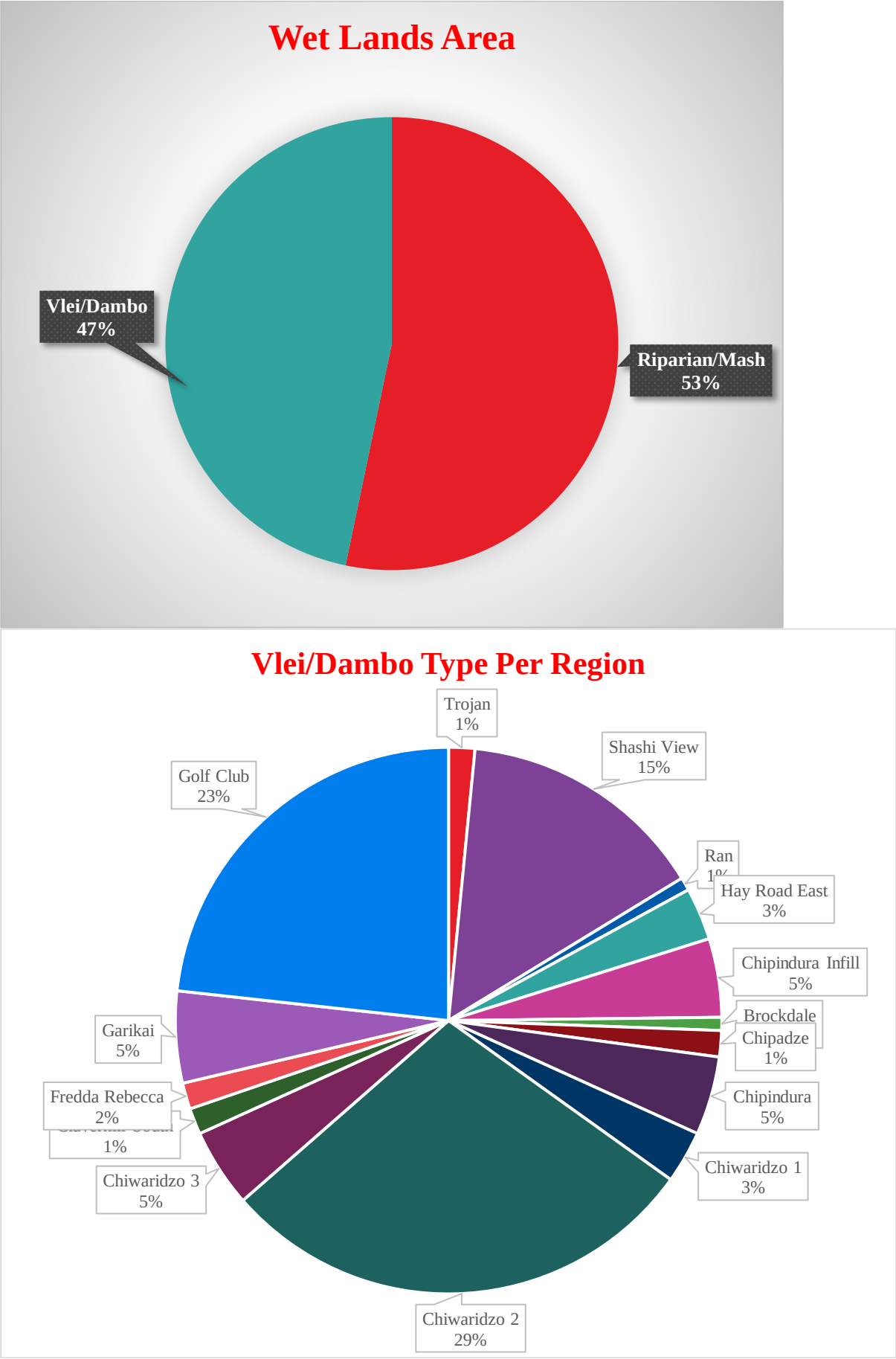
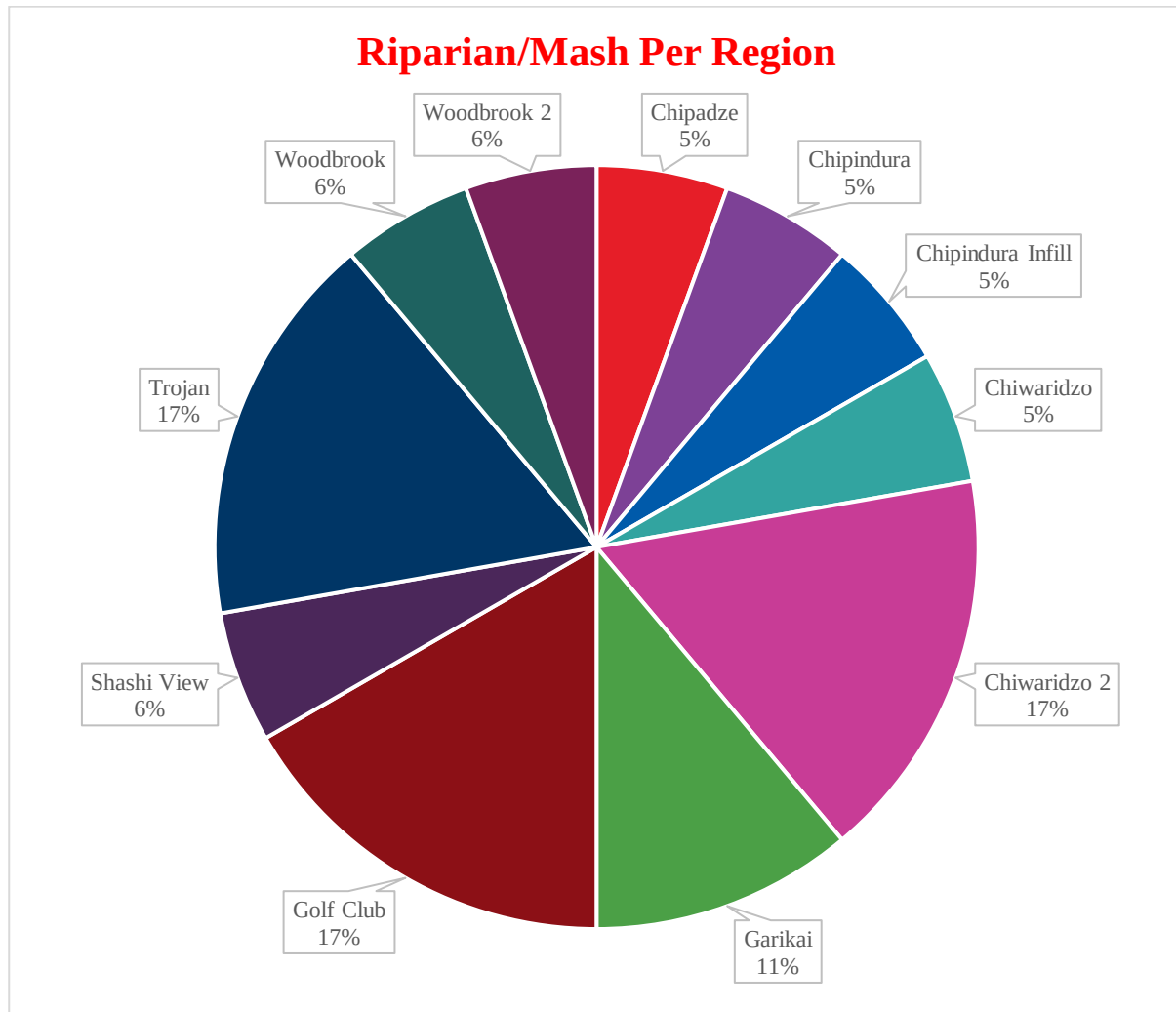


Figure 6-3: Distribution of Mash Sites by Neighbourhood



6.3 Pollution of Water Resources from Mining Activities

Kanda et al (2021)³, in a study of the quality of groundwater from shallow hand-dug wells at a RAN Mine abandoned tailings dam; confirmed that groundwater quality parameters were lower than international drinking water quality guidelines. On the overall, the results showed that groundwater had higher concentrations of contaminants during the dry season as compared to the wet season. The main source of contaminants were leaching from the tailings dams, and also chemicals from agricultural activities.

³ Kanda et al 2021; **Trace elements in groundwater near an abandoned mine tailings dam and health risk assessment (NE Zimbabwe)**; Water SA 47(4) 446–455 / Oct 2021
<https://doi.org/10.17159/wsa/2021.v47.i4.3851>

Dzomba et al (2012)⁴ also demonstrated the polluting effects of mining activities in Bindura Town. The results showed that mining activities were a leading cause of heavy metal contamination of soils and food plants leading to health risk fears. “The concentration of heavy metals in soils, ...in the vicinity of Bindura town were investigated. Results show that heavy metal concentration of soils and plants found around Bindura Town was higher than that of the control area where there were no mining activities suggesting heavy metal contamination. The higher values of heavy metals may place consumers of these plants at health risk with time via bioaccumulation;” (Dzomba et al 2012: 1). Thus a key conclusion reached by the study was that soil to plant transfer is the major component of human exposure to heavy metals through the food chain, making residents of Bindura Town exposed to such health risks. The study also noted that heavy metal contamination is more pronounced in areas around mines due to physical contamination by dust.

6.4 Other Environmental Challenges in Bindura Town

Data from the Bindura District Profile show that the activities of artisanal miners are a major cause of soil erosion and massive siltation of water bodies. Bindura Town is affected by the same. As discussed elsewhere in the Report, Botha Mine Claim operates under artisanal miners who are largely incapable of implementing meaningful soil conservation measures in the areas they operate. Even the 1996 Master Plan highlighted soil erosion and siltation of rivers as major environmental problems in Bindura Town. Other environmental challenges in Bindura Town and beyond relate to pit sand and river sand extraction and brick moulding.

6.4.1 Challenges with the Management of Solid Wastes

Like many other towns and cities in Zimbabwe, the Bindura Municipality is faced with challenges related to the management of solid wastes. The work of Chikombe S (2017)⁵ highlights some of the critical issues- affecting Bindura Town. “Refuse removal in Bindura, is hardly in tangent with the waste collection schedule such that garbage remains uncollected for weeks and the common outlook are illegal dumps and overflowing garbage bins. Solid waste workers are obliged to sweep, shovel the garbage by hand and to lift the heavy, overloaded bins. The solid waste workers are exposed to substantial levels of physical, chemical, as well as biological toxins emanating from the rotten waste;

⁴ Dzomba et al (2012): **Heavy metal contamination risk through consumption of traditional food plants growing around Bindura town, Zimbabwe**, Journal of Toxicology and Environmental Health Sciences Vol. 4(5), pp. 92-95, May 2012 Available online at <http://www.academicjournals.org/JTEHS>

⁵ Chikombe S (2017): **Occupational Safety And Health Hazards Associated With Solid Waste Management In Bindura, Zimbabwe**; A Dissertation Presented To The Department Of Geography And Environmental Studies In Partial Fulfilment Of The Requirements Of The Award Of The Master Of Science In Safety, Health And Environmental Management Degree Midlands State University

(Chikombe 2017: 5). The same study revealed that waste loading bays which were located in the market places and shopping centres located in the high density suburbs; posed a threat to the surrounding environment, animals and human health as they were poorly designed and could not adequately contain the waste. Uncollected solid waste was scattered all over the surroundings; while the lack of mechanisms to contain leachate from flowing directly into the environment was also evident. Box 6.1 summarizes some of the key effects of the failing waste management services in Bindura Town.

Box 6-1: Effects of the Failing Solid Wastes Management Services

- Garbage was observed strewn all over in the outskirts of the town and several storm drains were evidently blocked by waste; a situation that gave rise to flooding during the rain season.
- The disposal dumpsite in Bindura town did not conform to the legal standards provided for by the Environmental Management Act, Chapter 20:27. An unlined, disused mine pit at *Kitsiyatota* was observed to be the point of solid waste disposal. It was observed that the dumping area was not monitored and there were no dump attendants, thereby allowing free access to scavengers who were not monitored.
- Fires were observed at the dumpsites. These could be attributed to the high methane gas content that is produced as a by-product of waste decomposition.
- All waste workers had inadequate Personal Protective Equipment (PPE). Street sweepers wore gloves only when they were handling waste. Most workers did not wear face masks to protect themselves from dust and smoke.

Source: Summarized from Chikombe 2017

6.5 Existence of Special Tree Specie

Bindura Town is home to huge and very impressive Fig Trees. Several of these are located in various parts of the town. It is important to preserve this special tree under Section 31 of the Regional, Town and Country Planning Act (RTCP) (Photo 6.1 refers.)

Picture 6-1: A Fig-tree in Bindura Town



Source: Field Survey 2024

According to Section 31 of the RTCP Act, Bindura Municipality can ‘serve on the owner and occupier of any land an order for the preservation of natural forest, trees or woodlands or any trees on that land.’ When such an order is issued, such trees or forests are protected from being cut or destroyed.

6.6 Afforestation Projects in Bindura Town

The Forestry Commission is leading on the implementation of afforestation projects. This is motivated by the desire to create urban landscapes that are safe and affordable; while also creating climate change resilient cities. Table 6.3 summarizes the afforestation projects implemented in Bindura Town.

Table 6-3: Afforestation Projects by the Forestry Commission

Site	Project	Size	Number of Trees planted	Main Function
Lincoln Recreation Park	Recreation Park	8 ha	100 Red Mahogany 400 water berry	Establishment of an urban green belt
Cleverhill Farm			50 Kenayn croton, 100 Leaceana, 100 Vachellia Xanthophloea; 20 Flamboyant	Ornamental trees and compatible species to conserve a wetland site
Hospital 47	Eucalyptus woodlot	1ha	1 600 Eucalyptus	Exotix woodlot to expand a pollution buffer from gold mining
Chipindura High School	Fruit Tree Orchard	0.5 ha	200 Citrus trees 25 assorted exotic trees	Trojan Mine and Securico sponsored project to enable schools to establish income generating forest projects
SOS Herman Gemeiner	Fruit Tree Orchard		25 assorted trees	Securico sponsored to enable schools to establish income generating forest projects
Fredda Rebecca Mine	Eucalyptus woodlot	3.75 ha	6 000 Eucalyptus	Established as a pollution buffer from gold mining activities

Bindura Hospital	Beautification		4 Jacaranda, 2 Red Mahogany	Beautification with ornamental trees
NSSA Complex	Beautification		4 Kenyan Croton	Beautification with ornamental trees
Herentals Group of Schools	Beautification		10 Vachellia Xanthophloe	Beautification with ornamental trees
Brookedale	Beautification		50 ornamental trees	Beautification with ornamental trees
Shashi View Primary School	Fruit tree orchard		55 fruit trees, 4 indigenous trees	Fruit tree orchard
Veterinary Complex	Beautification & fruit trees		10 fruit trees; 7 ornamental trees	Fruit tree orchard
ZEGU	Beautification		60 ornamental trees	Beautification with ornamental trees
BUSE	Beautification		50 assorted trees	Beautification with ornamental trees

Source: Forest Commission Data; Mashonaland Central; 2024

6.7 Critical Planning Issues

- There is a significant encroachment of development activities on to sites designated as wetlands. This is evidence of a lack of management and enforcement mechanisms that are supposed to protect wetlands. Effectively; the management conditions attached to wetlands are not being adhered to.
- There is growing evidence on the pollution of water resources from mining activities. An even higher risk also exists when the soil to plants transfer of contaminants exposes humans via the food chain. This calls for adequate measures that control the pollution of water resource.
- The Forestry Commission's afforestation projects need to be escalated across Bindura Town. Afforestation projects are critical interventions required in the mitigation of negative effects of climate change and the rehabilitation of excavations left by the mining sector.
- The disposal dumpsite in Bindura Town needs to be constructed properly so that it can conform to the legal standards provided for by the Environmental Management Act. Chapter 20:27.

An Environmental Conservation Order, issued in terms of Section 31 of the RTCP ACT, is required for the protection of the Fig Trees in various locations in Bindura Town

Chapter 7 : Population; Employment and Mining in Bindura Town

7.1 Introduction

This chapter presents information on the population; employment issues and the economy of Bindura Town. The materials on population and employment largely derive from the review of literature, especially ZIMSTATS data and other reports. At this stage; the major limitation of ZIMSTATS data is that at the time of writing the Report, disaggregated census information is not available at the provincial level.

7.2 Population Dynamics in Bindura Town

Based on the 2022 National Census, Bindura Town has a total population of 51 393 people, of which 52% and 48% are the female and male population respectively. Table 7.1 shows the specific details of the population, while Figure 1.1 shows population distribution by sex. As shown in Figure 7.2, population distribution by sex has remained the same for the 2012 and 2022 Census results in percentage terms. The average Household size ranges from 3.4 to 4.0 people. Ward 12 is the most densely populated, with over 83 people per hectare, compared to less than 2 people per hectare in Ward 3 (Table 7.1 refers).

Table 7-1: Population Distribution by Ward in Bindura Town

Characteristics of Population By Ward (Bindura Municipality 2022)						
Ward	Size (Ha)	Suburb	Total Population	Total Households	Average Household Size	
1	406.9784		4478	1170	3.8	11.0
2	399.0457		2766	688	4	6.9
3	561.2327		1045	305	3.4	1.9
4	68.53448		2730	759	3.6	39.8
5	56.92971		3119	912	3.4	54.8
6	33.32233		2870	763	3.8	86.1
7	42.79812		1856	508	3.7	43.4
8	73.00194		5424	1562	3.5	74.3
9	119.3335		6680	1755	3.8	56.0
10	53.54903		3422	930	3.7	63.9
11	19.76763		3509	983	3.6	177.5
12	162.3589		13494	3708	3.6	83.1
	1996.85244		51393	14043	3.7	

Source: ZIMSTATS 2022

Figure 7-1: Population by Sex in Bindura Town

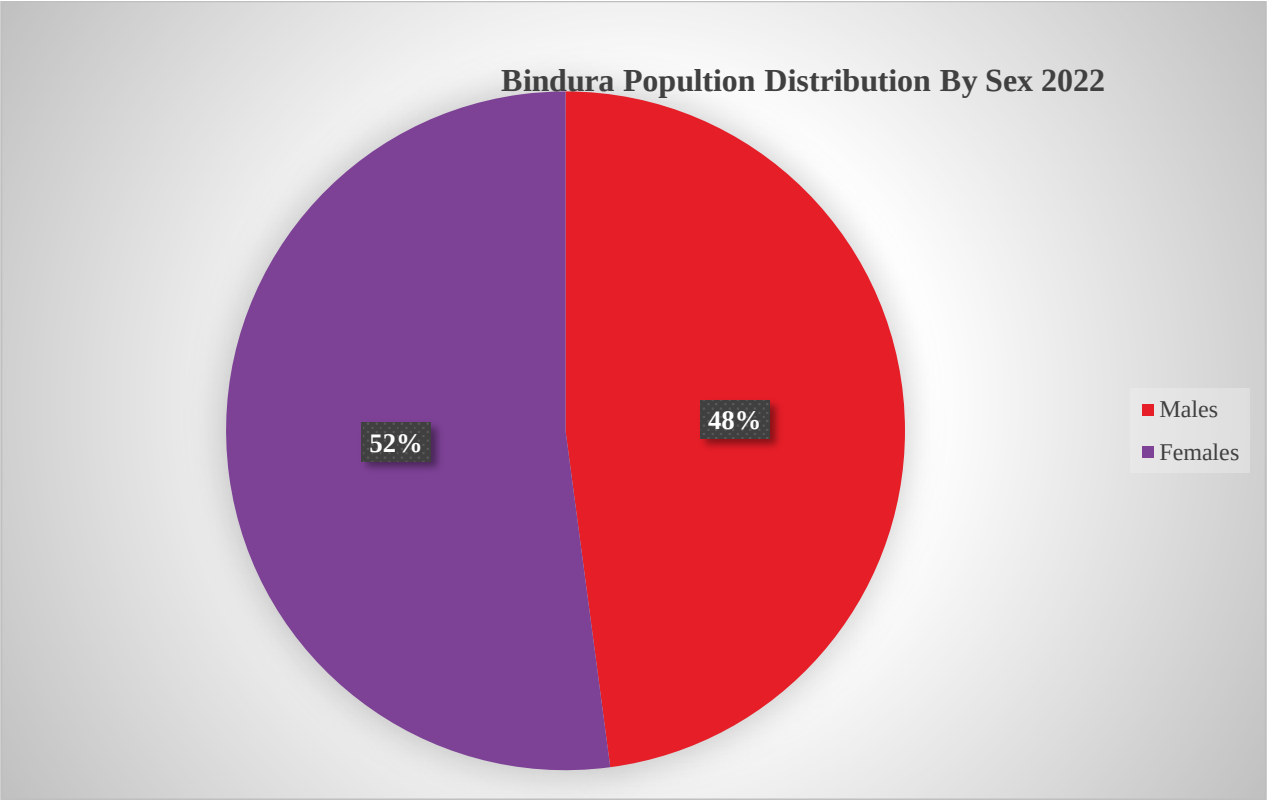
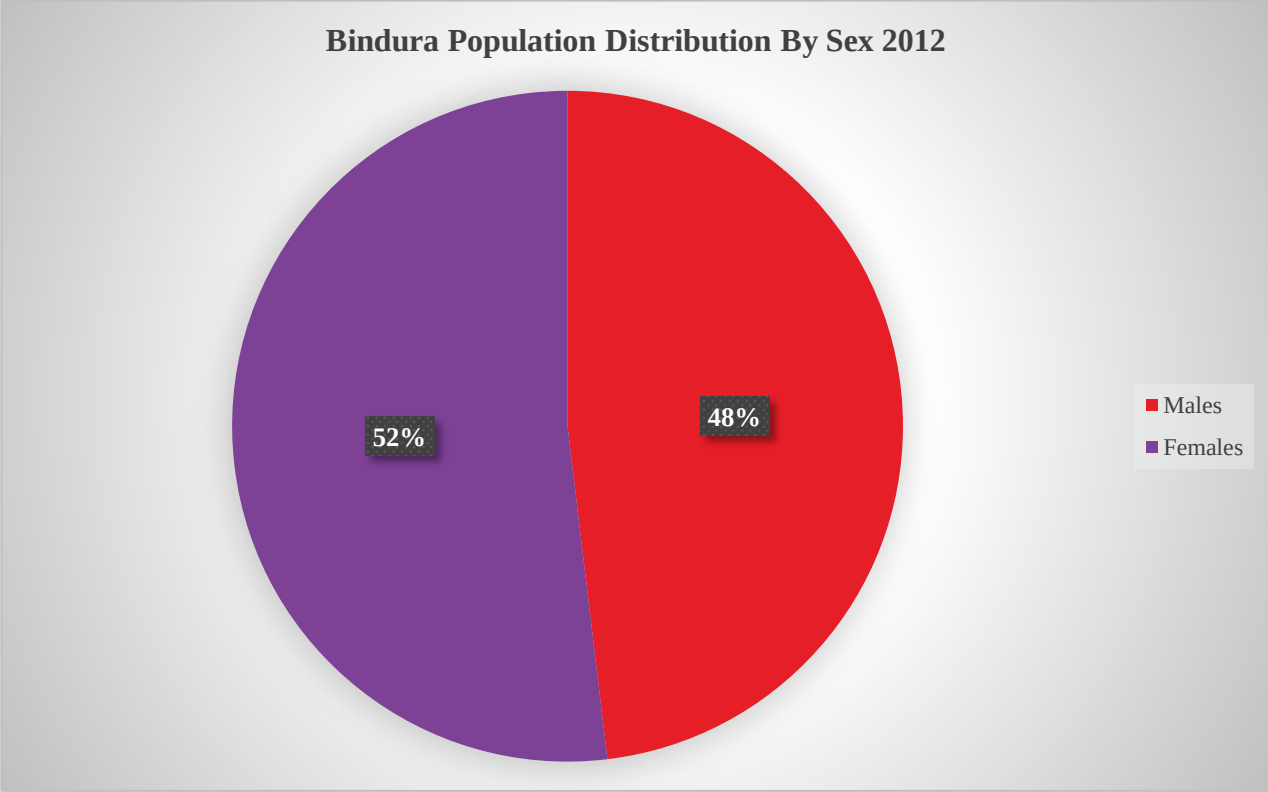


Figure 7-2: Bindura Population Distribution by Sex 1in 2012



Population Growth in Bindura (1982-2022)

In historical terms, the population of Bindura Town grew from 17 966 people in 1982; to the current 51 313 people in the year 2024. In general, the population almost tripled over a period spanning 40 years (Figure 7.3 refers). Figure 7.3 and Table 7.2 show the population growth rate in Bindura Town for the period 1962 to 2012. For the Census period 2002-2012, the population growth rate was about 2.9%.

Figure 7-3: Population Growth in Bindura Town: 1982-2022

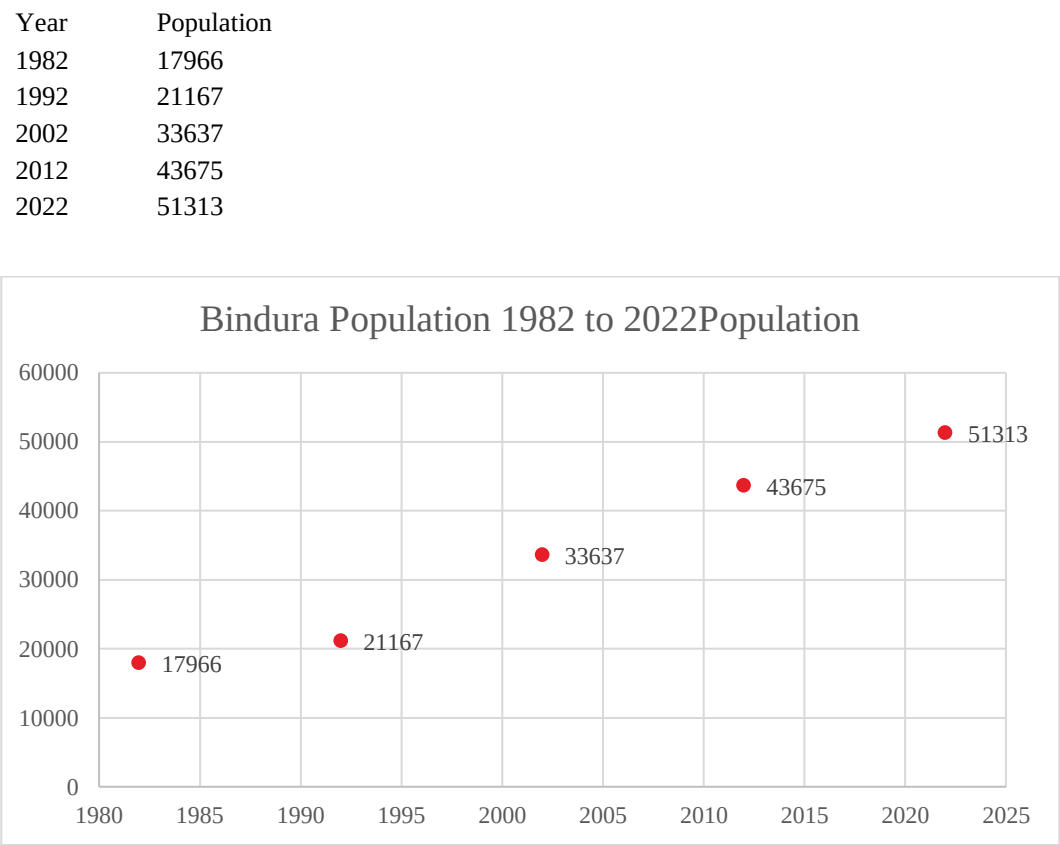
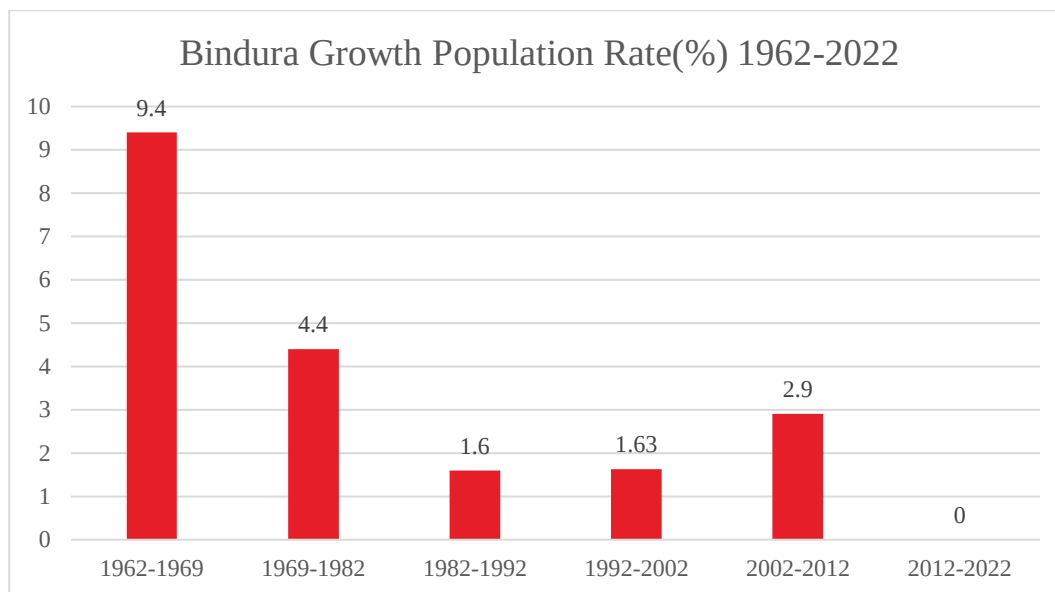


Table 7-2: Population Growth Rates in Bindura Town: 1962 -2022

Natural Growth Rates 1962-2022		
Years	Growth rate (%)	
1962-1969	9.4	
1969-1982	4.4	
1982-1992	1.6	
1992-2002	1.63	
2002-2012	2.9	
2012-2022	0	

Source: Compilations from various Census Reports

Figure 7-4: Population Growth Rates in Bindura Town: 1962 -2022



To the extent that the population in Bindura Town relies on the economy of Bindura Town for a living; the next section addresses issues of employment and the economy of Bindura Town.

7.3 Employment situation: Public sector, Bindura Municipality; Private sector

The major employers are the mining establishments within and surrounding the Town Council area. The commercial sector and public administration are also notable sources of employment. The major employers in Bindura town are mines which employ around 50% of the town's working population (Chikombe 2017, quoting Bindura Municipality, 2017).

7.4 The Economy of Bindura Town

The economy of Bindura Town is anchored on mining and agriculture. Both formal and artisanal mining are dominant in the town. There are multiple economic activities linked to artisanal mining, including transport provided by small trucks involved in the movement of mining ore to milling places. Food is also served deep-inside the areas where artisanal mining is taking place. Other economic nodes in the town include industry and the two universities located in Bindura Town – the Bindura University of Science Education (BUSE) and the Zimbabwe Ezekiel Guti University (ZEGU). The Central Business District is key to providing commercial services (see discussion in Chapter 3). Table 7.2 shows the Gross Domestic Product Contribution for Mashonaland Central Province. The dominant sectors are Agriculture, Forestry and Fishing at 30.9%; Mining and Quarrying at 18.7%; Manufacturing at 7.9%; Wholesale and Retail Trade, and Repair of Motor Vehicles at 11.4%; and Finance and Insurance at 5.6%. With Bindura Town as the Provincial Capital and the most developed urban centre, it is evident it provides the greatest contribution to GDP in the province.

Table 7-3: Gross Domestic Product Percent Contribution at Constant Prices in Mash-Central Province 2020

Industry	Mash. Central
Agriculture, Forestry and Fishing	30.9
Mining and Quarrying	18.7
Manufacturing	7.9
Electricity, Gas, Steam and Air Conditioning Supply	1.8
Water Supply; Sewerage, Waste Management & Remediation Activities	0.1
Construction	2.5
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	11.4
Transportation and Storage	1.4
Accommodation and Food Service Activities	0.7
Information and Communication	3.9
Financial and Insurance Activities	5.6
Real Estate Activities	2.6
Professional, Scientific and Technical Activities	0.0
Administrative and support service activities	0.9
Public Administration and Defence; Compulsory Social Security	1.8
Education	1.3
Human Health and Social Work Activities	1.5
Arts, Entertainment and Recreation	0.4
Other Services	1.2
Activities of Households as Employers, undifferentiated goods - and services - Producing Activities of Households for Own Use	0.0
GDP at Basic Prices	94.6
Net Taxes on Products	5.4
Taxes on Products	5.5
Less Subsidies on Products	0.1
GDP at Market Prices	100.0

Source: ZIMSTATS 2020 Data

7.4.1 The Chipadze Main Bus Terminus and the Bindura Main Vegetable Market

The Chipadze Main Bus Terminus and the Bindura Main Vegetable Market form an important part of the local economy of Bindura Town. Table 7.3 shows specific details of the Chipadze Main Bus Terminus. Located in Chipadze Township, the Bindura Main Vegetable Market provides a market for a diverse range of products; ranging from vegetable produce, various types of foods and a wide assortment of natural resources products (see also Table 7.4, and Photos 7.1 and 7.2). A total of 63 registered operators operate from the market, paying a fees of US\$20 per month. The types of goods sold at the market as depicted on Photos 7.1 and 7.2 show a strong linkage between Bindura Town and its rural hinter-land; with some products sourced as far as Mount Darwin District. Surrounding farms are an important source of agricultural produce that support the Bindura Vegetable Market.

Table 7-4: The Chipadze Main Bus Terminus

1	Area Covered By The Bus Terminus	Area: 9995 m ²
2	Stand number	Stand number: 5784
3	Number of Parking Bays	4 x 50 m Loading Bays
4	Types of Vehicles Allowed Into And Out of The	Inter City Busses Commuter Omnibuses Cross Border (International) Buses
5	Volume of Traffic Handled Per Day By Type of Vehicle	13 Buses per Day
6	Fees Payable By Operators	20 Dollars per Entry
7	Main Service Routes	Mt. Darwin - Mukumbura Musana - Domboshava Harare – Mazowe
8	Public Services Offered At The Main Bus Terminus.	Public Toilets 1 Tonne Refuse Solid Waste Removal Daily
9	Quality of Environment Solid Waste / Dump Sites Drainage Issues	The Environment Is Satisfactorily Clean Solid Waste Is Routinely Disposed Of By Council Storm Water Is Adequately Installed And Functioning Well

Source: Compiled By Bindura Municipality, April 2024

Table 7-5: The Bindura Main Vegetable Market

	Parameter	Details
1	Stand number	Stand number 5712
2	Area	2408m
3	Number of Registered Operator's	63 Registered Operators Non-Registered daily farmers pay daily.
4	Amount Paid by a Registered Operator	US\$20 Per Month
5	Main Types of good sold	Fruits and Vegetables Dried Cereals (maize, wheat, peanuts etc.) Herbs and spices. Legumes
6	Source of goods	Local Vegetable Gardens Nearby Farms And Plots Further Towns (Shamva, Mt.Darwin, Masembura, Nyava Manhenga etc.)

Source: Compiled By Bindura Municipality, April 2024

Picture 7-1: Natural Resource Products on sale at the Bindura Main Vegetables Market



Source: Field Photos, 19 May 2024

Picture 7-2: Natural Resource Products on sale at the Bindura Main Vegetables Market



Source: Field Photos, 19 May 2024

It is evident that the type of structures at the Bindura Main Vegetable Market are temporary in nature, and cannot stand against severe weather conditions associated with, for instance; strong winds and torrential rains and excessive heat.

7.4.2 SMES in Bindura Town

SMEs in Bindura Town exist in diverse forms. Key typologies include Tuck-shops; Tombstone Making; Barbershops; Floriculture; Welding; Carpentry; Flea Markets; Vehicle Repairs etc. Table 7.5 shows examples of SMEs that obtain in Bindura Town. Typically, most of these types of SMEs are not provided for in terms of space requirements in existing Layout Plans. As such, the tendency is for SMEs to be self-provisioning in terms of land requirements, often targeting any vacant land that suits the market needs of the activity.

Picture 7-3: A Tuckshop in Chipadze High Density Area



Source: Field Photos, 19 May 2024

Table 7-6: SME's in Bindura

Type Of SME's	Land Occupied	Location Of SME's
Carpenters	Home industry	Chipadze Home Industry
Welder	Home industry	Chipadze Home Industry
Tailors	Home industry	Chipadze Home Industry
Hardware operators	Home industry	Chipadze Home Industry
Upholstery	Home industry	Chipadze Home Industry
Mechanics	Home industry	Chipadze Home Industry

Source: Bindura Municipality Records

Discussions with the Bindura Municipality officials revealed some of the operational challenges that characterize the SME sector. For instance, SME operators often shows resistance to operate from designated sites, preferring to operate from road sides, open spaces and back yards of commercial stands. Also, SMEs are often characterized by the haphazard erection of substandard structures without proper planning standards thereby compromising city aesthetics. Missing in almost all the cases are sanitation facilities that service specific SME sites.

7.4.3 Mining in and Around Bindura Town

From the start, mining by formal companies played and continue to play a central role in the development of Bindura Town. Currently, three main mining companies namely Ran Mine, Bindura Nickel Corporation and Freda Rebecca Mine represent the pillars of formal mining in Bindura; and by implication; are key to the ‘functional sustenance of Bindura Town’ in terms of, among other things; employment and commercial functions. Historically; the first nickel deposit was discovered at Trojan Mine, Bindura; in 1956. Bindura Nickel Corporation Limited operates a mine and a smelter complex in Bindura. It is engaged in the mining and extraction of Nickel and the production of Nickel by-products (Copper and Cobalt). The Group’s major product is Nickel concentrates which contain Nickel sulphide. The main uses of Nickel are the production of

stainless steel and battery cathode. With the development of electric and hybrid cars in the automotive industry, the demand for Nickel sulphide is projected to rise steadily in the medium to long term (Bindural Nickel Corporation Limited; 2022 Annual Report).

From a historical perspective; the first concentrate was produced in 1964. Bindura Nickel Corporation Limited (“BNC”) was established by the Anglo American Corporation Group in Zimbabwe in 1966. The smelter and refinery were constructed in 1968 while the first production of nickel cathode was achieved in the same year. The Company was listed on the Zimbabwe Stock Exchange in 1971. BNC employed 1068 personnel as at 31 March 2020 (2019: 979); ⁶ (see Box 7.1 for the strategic importance of nickel as a resource).

Box 7-1: Industrial Uses of Nickel

Industrial uses of nickel sulphate include battery cathodes, electrolysis plating and electroplating. With the development of electric and hybrid cars in the automotive industry, the demand for nickel sulphate is set to rise steadily in the medium to long term.

Bindural Nickel Corporation Limited; 2020 Annual Report

As an activity, mining has been affected in terms of performance by the macro-economic conditions at the global and national context (see also discussion in Chapter 1). After a plunge in nickel prices, in 2008 BNC operated on "care and maintenance" basis, culminating in its shutdown the same year. At the time of its shutdown, it was the only integrated nickel miner, smelter and refinery in Africa. The shut-down of BNC in 2008 resulted in many job losses without compensation and with employees being told not to look for other jobs as they would be reinstated once the mine re-opens. Employees who were retrenched received a stipend of \$50 a month. Given that many employees had families, many left the mines with no compensation and struggled to make a living thereafter. The mine eventually restarted in 2012; (<https://www.google.com/url?sa>).

“Trojan Mine, located in Bindura was restarted in 2012 after 4 years of care and maintenance. It has an inferred resource size of 8.59 million tonnes of 1.00% nickel ore grade which amounts to 85,600 tonnes of contained nickel. The mine has proven ore reserves of 2.76 million tonnes at an average grade of 0.86% nickel ore, amounting to 23,600 tonnes of contained nickel;” (<https://binduranickel.co.zw/overview/2>). To be precise, the mine is located 5 km south-west of Bindura Town; using underground mining techniques. Trojan Nickel Mine Limited has a total of 87 claims, occupying 1800 hectares of land. Zimbabwe’s government owns 70% of Bindura Nickel Corporation’s (BNC) Trojan nickel mine. At one stage the company employing some 1,100 people

⁶ Bindura Nickel Corporation Limited; 2020 Annual Report

(according to the company's annual report). Yet, current data from the Mine showed the total employed has fallen to 592 underground workers and 72 administrative workers, totalling 664 (Key Informant Interviews with Trojan Nickel Mine, June 2024).

Clearly, the economy of Bindura Town is affected by the performance of the mining sector; and more specifically mining operations of Trojan Mine, Freda Rebecca Mine and Ran Mine. On the other hand; Freda Rebecca Gold Mine has proven reserves of 2.4 million tons (mt); operating as both an opencast and underground mining. The mine is next to Phoenix Prince, an open pit 2km southeast of Freda Rebecca. Phoenix Prince is included in the mineral resources of Freda Rebecca. The development of the Freda Rebecca gold mine began in the 1980s by Cluff Resources through two open-pits (Freda and Rebecca), with the mine producing its first gold in 1988. The licensing rights of the mine were purchased by the Zimbabwe-based Ashanti Goldfields in 1996; but has since changed hands again to Kuvimba Mining House.

Service provision, especially water supply for mining areas; represent a key point of interaction between Bindura Town and mining companies in the town.

Historically, water supply for Trojan Mine and the BSR is sourced from Mazowe River. “Water is supplied to the process plant from the Mazowe River. The plant requires 260Ml water per month under normal operation conditions. The mine is a relatively dry mine and a small amount of water is supplied from mine dewatering. All the water requirements for Trojan Mine and the BSR are supplied from the pump station on the Mazowe River, which has a pump capacity of 397Ml per month. The pipeline has been in operation for some time and it is reported that some sections have been replaced. This is likely to be an ongoing requirement as age takes its toll on the installation. This supply is reported to be reliable and no problems with the availability of water from the Mazowe River have been reported in the past”⁷ (SRK Consulting (SA) Pty Ltd 2007: 18). Concerning *water supply for Freda Rebecca Mine*; water is supplied to the process plant from dewatering operations of the mine. Make-up water is supplied from the Mazowe River. The plant requires 125Ml water per month under normal operation conditions. 50ML is supplied from the mine dewatering operation and 75Ml from the Mazowe River. This supply is reported to be reliable and no problems with water from the Mazowe River have been reported in the past. Potable water is supplied by the Bindura Town Council (SRK Consulting (SA) Pty Ltd (2007). From the foregoing; Trojan and BSR mining operations share the same water sources with Bindura Town. In view of that; projections of supply and demand factors

⁷SRK Consulting (SA) Pty Ltd (2007): An Independent Technical Report On; Bindura Nickel Corporation, Freda Rebecca Mine and Semkhat, The Material Assets Of Mwana Africa Plc Prepared For: Mwana Africa Plc Prepared By: SRK Consulting (Sa) Pty Ltd; Johannesburg: SRK Consulting (SA) Pty Ltd (2007): An Independent Technical Report On; Bindura Nickel Corporation, Freda Rebecca Mine and Semkhat (Anmercosa Exploration Congo Sprl), The Material Assets Of Mwana Africa Plc Prepared For: Mwana Africa Plc Prepared By: SRK Consulting (Sa) Pty Ltd; Johannesburg

are therefore determined by the requirements of both Bindura Town and the mining companies. This calls for coordinated planning. As for Freda Rebecca Mine, potable water is supplied by the Municipality of Bindura.

The Current Operational Context of Freda Rebecca Gold Mine

Freda Rebecca Gold Mine Limited started mining operations in 1987. It has one mining claims in Bindura Town; with a total area of 5009 Hectares of land. The Mine uses both underground and open pit mining. Currently it has 849 employees, broken down as follows:

- 120 administrative
- 355 Surface; and
- 374 underground staff

In terms of water usage; it relies on municipal water for domestic use on normal billing. The use about 15,000-16,000 m³ per day for the entire plant processing activities. The water comes from Mazowe River (as regulated by ZINWA every 3 years) and from the Return Water Dam. About 67% of the water is from the Return Water Dam and the balance is from Mazowe River as part of the company's sustainability strategy.

Freda Rebecca Mine hires out services to numerous other companies that support its operations. Table shows the list other companies that provide services to the Mine and type of service offered.

Table 7-7: Companies contracted by Freda Rebeca Mine for other Services

CONTRACTOR NAME	WHAT THEY DO
R. DAVIS	LOAD AND HAUL
ORCA	LOAD AND HAUL
BILLNICK	TAILINGS STORAGE MANAGEMENT
CHROMEBASE	HAULING
PLATINUM FOODS	CATERING
SANDVIK	TECHNICAL ADVICE/ PRODUCT SUPPORT
INTRACHEM	EXPLOSIVES SUPPLY
NAILIT	LOAD AND HAUL
NORTHLANDS	LONG HOLE DRILLING
HILMAX	HYDRAULIC HOSES AND BELT MANAGEMENT
TIMSITE	HAULING
BLUE HORIZON	TRANSPORT SERVICES
FAWCETT	SECURITY
SECURICO	SECURITY
BIRDCOCK	SECURITY
GUARD ALERT	SECURITY
NASHY MINING	DEVELOPMENT DRILLING

Source: Freda Rebecca Gold Mine Limited Records 2024

It must be noted that the Mine even outsources some of its services outside Bindura. In that respect; services that are not available locally include

- Specialised Engineering Maintenance,
- Engineering Spares,
- Specialised Medical Services,
- Assay Laboratory Services;
- Processing consumables,
- Mining consumables;
- Motor vehicle servicing; and
- Technical Colleges

The main plans for rehabilitating the environment include:

- the Mine Closure and Rehabilitation Plan,
- tree planting at tailings dam,
- donation of trees, and;
- partnership with local quarry companies to deplete waste rock

It is expected that mining operations can only happen at a cost to the environment. Table 7.6 summaries some of the impacts mining on the environment, using Trojan Mine and Freda Rebecca Mine as case studies. Key Informant Interviews with Trojan Nickel Mine officials revealed that the company has a Mine Closure Plan in place, with a provisional budget of US\$10.8 million that is budgeted for.

Table 7-8: Illustrations of the Environmental Impacts of Trojan Mine and Freda Rebecca Mine

Trojan Mine and Impact on Environment	Freda Rebecca Mine and Impact on the Environment
Trojan Mine It is understood, that there are times when the mine exceeds the compliance limits stipulated in its various permits, particularly with regard to sulphate, though this has been partially rectified by the construction of the toe drain at the rock dump and the implementation of the “cleaner production policy”. The following environmental issues have been identified: Hazardous material handling: According to the mine, the only potentially hazardous material generated by the mine is used oil, which is managed via a number of physical controls and procedures. Land degradation: There are ten tailings disposal facilities present on the mine of which two are active. Seven of the remaining eight have been re-vegetated. Surface and ground water quality: The mine has developed a monitoring schedule to include both surface and groundwater and indicates general compliance with its various permit conditions. The mine intends to become fully compliant. It is SRK’s opinion that the groundwater monitoring network needs revision in that there are insufficient boreholes around the mine to fully monitor the impact. Dust control: The mine has implemented a dust monitoring program to measure irrespirable dust in operational areas as well as ambient dust releases to the environment. Where possible dust control is achieved through vegetation or watering. Pollution potential of mine residues: The mine has undertaken Acid Base Accounting (“ABA”) testing on its residue facilities and the initial results indicate that although there are elevated sulphur concentrations in some of the residue material (>0.25%), there is sufficient buffering capacity in the residue to neutralise acidity produced. Concerning the Bindura Smelter and Refinery, there were times when the mine exceeded the compliance limits stipulated in the	At Freda Rebecca Mine; it is understood, from the monitoring of groundwater from the two existing boreholes, that there are times when the mine exceeds the compliance limits stipulated in the various permits, particularly with regard to soluble heavy metal (arsenic and mercury) concentrations and sulphates. Hazardous material handling: The use of cyanide in the gold extraction process has led to spills of the solid on the soils in the plant as well as generating cyanide dust which enters the atmosphere. Cyanide solution from the mixing tanks has spilled and entered the storm-water system whilst there is evidence that cyanide salts are leaching onto the soil surface. Land degradation: The opencast workings of the mine have generated significant waste rock dumps that have been rehabilitated with a good cover that should minimise dust generation as well as water ingress. Historically the mine extracted gold from ore using heap leach technology and there is a defunct heap leach dam present on the property. It is expected that this dam has properties similar to the tailings material and is unlikely to generate acidity. Surface and ground water quality: The monitoring results indicate to SRK that the mine impacts on both surface and groundwater quality due to the presence of salts and instances of elevated heavy metal concentrations.

various permits, particularly with regard to soluble heavy metal concentrations. Air Emissions: During the visit it was observed that significant amounts of dust and sulfur dioxide were being emitted from the smelter. Although the complaints register in the EMS did not reflect any formal complaints, it was reported that residents of the local community are unhappy with the emissions. Surface and ground water quality: BSR has developed a monitoring schedule to include both surface and groundwater. Historically there have been periods when the water released from the process area has been out of compliance, particularly with regards to sulphate and some heavy metals. For the Bindura Smelter and Refinery; the mine has made a budgetary provision of approximately USD0.2 million per annum for environmental purposes; which SRK considered insufficient for the annual operation of the mine, with the expected costs being in the order of USD0.35 million. For Trojan Mine; historically the mine has made a budgetary provision of approximately USD0.2million per annum for environmental purposes; which SRK considered insufficient.	Dust control: The old tailings dam and waste rock dumps have been adequately covered to minimise dust generation. However, dust can be generated from the old opencast pits, new tailings dam, active waste rock dumps, crusher and roads. Dust is suppressed on the active roads by watering and at the crusher complex using sprays. Complaints and Community Involvement: The mine has received various complaints about dust. The mine consults the local community as and when required and participates in local forums. At Freda Rebecca Mine; a 2007 Report showed the company has a budgetary provision of approximately USD0.2 million per annum for environmental purposes but due to pressures for expenditures in other areas this provision is not utilised entirely for the necessary environmental aspects.
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Source: SRK Consulting (SA) Pty Ltd (2007):

Picture 7-4: Impacts of Mining on the Environment



Source: Field Photos, 19 May 2024

Case 7-1: The Case Study of Ran Mine

RAN MINES P/L started operations in 1949. The company has a total of 40 mine claims, occupying 365 ha of land. It is involved in open cast mining. In terms of employment, RAN MINES employs about 63 unskilled workers, 27 skilled workers; and staff involved in management. The company does not provide accommodation for its workers, and hence rely on housing in Bindura Town. In terms of its water and sewer

requirements, the company operates its own system; separate from the Bindura Municipality. It draws water from old underground mine workings, and uses about 3 M/L per day. There are several other companies contracted by RAN MINES, with the hired companies involved in related activities such as engineering, earth moving and mining. The use of open cast mining translates into massive excavation pits on the ground. Photos 7.5 show the dumping of rock wastes by RAN MINES on sites along the Shamva Road.

Picture 7-5: Rock Dumping along Shamva Road by RAN MINES



Source: Field Photos, 19 May 2024

7.5 Critical Planning Issues and Key Observations

- From the discussion in Chapter 1, population in Zimbabwe's urban areas is largely employed in the informal sector. Such a situation has implications on the space needs for the working population.
- Additionally, the type of housing requirements for that particular population is influenced by those economic factors. Accordingly, the Master Plan and subsequent planning tools must pay

particular attention to the land requirements of the informal sector for both economic activities and residential needs.

- The Bindura Main Vegetable Market and the Main Bus Terminus lack structures that protect users from extreme weather conditions associated with heavy rainfall and high temperatures. It is important for Bindura Municipality to provide for appropriate infrastructure that protect users from bad weather conditions.
- Admittedly, mining is a dominant activity in Bindura Town and its environment. Yet, mining as an activity is generally at conflict with the requirements for urban development. As explained elsewhere in the Report (see also discussion in Chapter 5, this Report), the existence of extensive mining claims has meant that such land could not be acquired for urban development. Consequent to that, it is important some of the land earmarked for urban development be reserved against mining activities.
- Connected to the above is the need for mining to rehabilitate the environment once mining is complete. A key policy issue is how the mining industry should be responsible for filling excavated pits. From the evidence presented, Trojan and Freda Rebecca Mines have environmental budgets which ideally should be used in the rehabilitation of the environment. It is therefore appropriate for Bindura Municipality and EMA to play a watchdog role and ensure that mining companies meet their environmental obligations. It is important for mining companies to compensate for the loss of forests through afforestation projects. In fact, un-rehabilitated pits that are widespread in Bindura constitute key sites for rehabilitation through afforestation projects. Such interventions are key to the mitigation of the impacts of climate change.
- The impacts of mining on groundwater quality and air quality require strict monitoring. The discussion in Chapter 6 has alluded to the effects of mining on the pollution of water sources. Bindura Municipality may need to partner other key agencies like EMA and relevant University Departments in the process of monitoring pollution of water and air quality.

Chapter 8 : The Housing Situation

8.1 Introduction

The first Township to be established in Bindura was Chipadze in 1965. This was where the majority of the poor residents who worked in the mines lived. Subsequent to that, the Chipadze Township Board was formed to look into the provision of housing and community services for the residents. Due to lack of resources on the part of the Township Board, Chipadze Township did not develop until October 1989 when Chipadze extension was developed. When Bindura achieved Town Status in 1990, the Department of Housing and Community Services was established to provide housing and community services. With the establishment of the department; the housing sector began to take shape with more housing units provided for in the low density area, the medium density area of Chipindura, and the high density areas of Chiwaridzo and Chipadze extension. Overtime, the housing sector in Bindura Town developed in response to the needs of the growing population. The traditional character of the housing sector made up of high density, medium density and low density housing has taken shape. In general, the performance of the housing sector is determined to a large extent by specific macro-economic factors operating in the national context. For this reason, the next section gives a brief summary of the macro-economic factors in the country and the implications on the performance of the housing sector.

8.2 Macro-Economic Factors and the Housing Sector

Of the country's 15 178 979 people in 2022 (ZIMSTATS 2022), 40% of the population lives below the poverty line, with 33.5% of the urban population living in informal settlements. Against this background, affordable housing in Zimbabwe remains a challenge due to multiple factors. The critical factors that explain the situation relate to the “high cost of serviced land, high costs of construction and building materials, inadequate government support, insufficient low-cost housing programmes, inflexible construction or lending policies and the high cost of borrowing. Furthermore, hyperinflation and foreign currency shortages in Zimbabwe have created economic instability and eroded real disposable incomes;” (<https://housingfinanceafrica.org/countries/zimbabwe/>). The trend has been that all transactions in land and housing development are usually denominated in US dollars. The demand for US dollars has placed immense pressure on the local exchange rate, further eroding disposable incomes for income earners. The mortgage market has been subdued in recent years and buyers prefer the use of cash to acquire or build houses. All this has contributed to an under-performing housing sector, Bindura Town included.

Whilst Zimbabwe has a well-developed financial sector and housing finance systems; with 16 housing financiers made up of 10 commercial banks, 4 building societies, one savings bank and one mortgage

finance company; this has not largely contributed to any significant supply of housing particularly to the low income groups. In essence, the self-build housing initiative of the poor is the main source of housing supply. The practice is that property developers offer stands while the buyer is expected to construct a home, typically without any financial assistance, and costs are too high for many common people to afford. In essence, the self-build housing initiative of the poor is the main source of housing supply; (<https://housingfinanceafrica.org/countries/zimbabwe/>).

According to Housing Finance Africa, land servicing costs amounted to about US\$23/m²; and on average the cost of construction in Zimbabwe per m² is between US\$81 and US\$122. As an illustration; a simple two- roomed cottage building costs around US\$6 400, with a three-roomed house costing US\$12 800, and a four-roomed unit costing about US\$14 400. Rentals in high-density suburbs of Harare such as Mbare, Highfields and Budiro average between US\$50 to US\$70 a room. In most cases, rentals are mostly payable in US dollars or in local currency, the latter using very high parallel market rates (<https://housingfinanceafrica.org/countries/zimbabwe/>). Indeed, the development of housing in Bindura Town, and the performance of the housing sector; has to be understood in this particular context.

According to ZIMSTATS, some 3.3 million people were listed as employed in 2022 with an unemployment rate of 19%. However, different stakeholders have disputed the employment figure as being too low. On the other hand, ZIMSTAT has argued that the percentage is correct since around 85% of those deemed “employed” are located in the informal sector. In view of this, any Urban Master Plan, and the subsequent Layout Plans, have to be sensitive to the needs of the informal sector; especially their space requirements. Also; most of the working population are civil servants who earn around US\$300 per month; inclusive of all allowances. In view of this; even well-paid civil servants barely have enough for household subsistence, let alone property rentals or mortgage repayments. For instance; “the average mortgage loan in July 2022 was US\$ 9 581, with a tenure of between five and 10 years; with a monthly repayment of US\$ 1 597); a figure still way above the capacity of formally potential mortgage earners.

The high cost of urban land remains a stumbling block for affordable housing in the country, Bindura Town included. Evidence to date shows that the smallest stand size on the market is 100m². At the price of US\$23/m², such stand size costs some US\$2 300. Additionally, the cost of building materials in the country is also high when compared to other countries in the region. As an illustration, one 50kg bag of cement costs between US\$10 and US\$14 compared to US\$5 in Zambia. There is a general concern that some building materials such as wood-fired clay bricks, commonly referred to as farm

bricks; cause land degradation, especially deforestation and increased soil erosion, while also causing high carbon emissions; (ZIMSTAT: 2022; Zimbabwe Population and Housing Census Report).⁸

The unaffordability of these formal housing systems has led to the mushrooming of land barons who typically trade land for informal occupation within unplanned urban settlements. The general trend is that such informal settlements have no access to social amenities and infrastructure. Housing production therefore largely relies on the self-build housing initiative of the poor, where property developers will provide stands while the buyer is expected to build a home, mostly with no supporting subsidies; (ZIMSTAT 2022: Zimbabwe Population and Housing Census Report). On the other hand, formal housing supply is largely dominated by the private sector which seeks large profit margins, making housing well beyond the reach of many (ibid).

This particular macro-economic context as described above has influenced the delivery of housing not only in Bindura Town; but across the whole country.

8.3 Existing Residential Development

Existing Residential development in Bindura Town is made up of the traditional categories of High Density, Medium Density and Low Density areas (Table 8.1 refers). In addition, there are flats located in various parts of the town. In fact, many of the residential schemes have tended to deliver a mixture of high, medium and low density residential stands. From Table 8.1, it is evident that residential suburbs such as Chipadze, Aerodrome, Chiwaridzo 1, Chiwaridzo 2, Chiwaridzo 3; Brookdale, Woodbroke North and Chipindura Park have a mixture of High and Medium Density stands. Existing Flats (Table 8.2 refers) comprises developments by the Urban Development Corporation and the Agricultural Finance Corporation located along the Bindura-Shamva road (but have since been sold to the University of Science Education), and others by the Ministry of Public Construction and National Housing (MPCNH) in Greenhill, along the Bindura-Mt Darwin road are notable examples.

Table 8-1: Residential Areas by Type

Area/scheme	High	Medium	Low
Chipadze	✓	✓	
Aerodrome	✓	✓	
Chiwaridzo 1	✓	✓	

⁸ ZIMSTAT (2022): Zimbabwe Population and Housing Census Report.
<https://zimbabwe.opendataforafrica.org/anjlpct/2022-population-housing-census-preliminary> (Accessed 21 April 2022)

Chiwaridzo 2	✓	✓	
Chiwaridzo 3	✓	✓	
Brockdale	✓	✓	
Woodbrooke North	✓	✓	
Chipindura Park	✓	✓	✓
Bindura T/Ship - CBD			
Hay Mine			✓
Greenhill			✓
Claverhill			✓
Shashi View			✓
Morningside			✓

Source: Bindura Municipality 2024

Table 8-2: Existing Flats in Bindura Town

LOCATION	NUMBER OF UNITS
Low density Area	64
CBD Area (Nandi Flats)	61
Police Flats(Musika)	18
Hospital Flats	14
Total	157

Source: Bindura Municipality 2024

From Table 8.3, most of the residential suburbs are served with water, sewer, roads and solid waste collection services. Three suburbs namely Greenhill, Claverhill and Morningside are not serviced.

Table 8-3: Existing Residential Areas and Service Delivery

AREA/ SCHEME	Type of Residential Area	Availability of Services			
		Water	Sewer	Roads	Solid Wastes Collection
Chipadze	•	✓	✓	✓	✓
Aerodrome	•	✓	✓	✓	✓
Chiwaridzo 1	•	✓	✓	✓	✓
Chiwaridzo 2	•	✓	✓	✓	✓
Chiwaridzo 3	•	✓	✓	✓	✓

Brockdale	•	✓	✓	✓	✓
Woodbrooke North	•	✓	✓	✓	✓
Chipindura Park	•	✓	✓	✓	✓
Bindura T/Ship - CBD	•	✓	✓	✓	✓
Hay Mine	•	✓	✓	✓	✓
Greenhill					
Claverhill					
Shashi View	•	✓	✓	✓	✓
Morningside					

Source: Bindura Municipality 2024

8.3.1 The State of Housing in Old Chipadze Single Quarters Section

Chipadze Old Location has its origin in the colonial period. “On June 30th 1934, consideration was given to the plight and requirements for shelter and formal housing of natives in Bindura. The Town Management Board recommended to the Minister for Native Affairs the establishment of the location. ..The initial stock was 70 buildings...;” (Department of Physical Planning 1993: 1). Located about two kilometres south-east of Bindura Town; “The initial settlement for the native population in Bindura grew to the east of Hay Mining Claims on Kimberly Reef Farm. This was the Ran Mine Area; just below the Bindura Kopje. This became the Native Location, a housing area for the native population variously engaged in paid employment..” (Department of Physical Planning 1993: 1). When the site was identified, pegging of individual stands was waived in preference to block pegging. This alternative was found to be economic in both cost and time; (ibid: 2). This created the initial planning problems as the setting out of individual stands was left to the builders as the building work progressed, a situation that gave rise to a disorderly arrangement in the siting of stands. Indeed, the blocks were not serviced by roads and hence the access challenges that still obtain in some sections of the neighbourhood (see for instance Insert 8.1)

According to the planning details of the initial development plan; “the Layout would accommodate 1000 married and 700 single natives in 201 houses for the married, and 34 blocks for single natives. The single block consists of 8 rooms for 32 natives;” (ibid: 2).

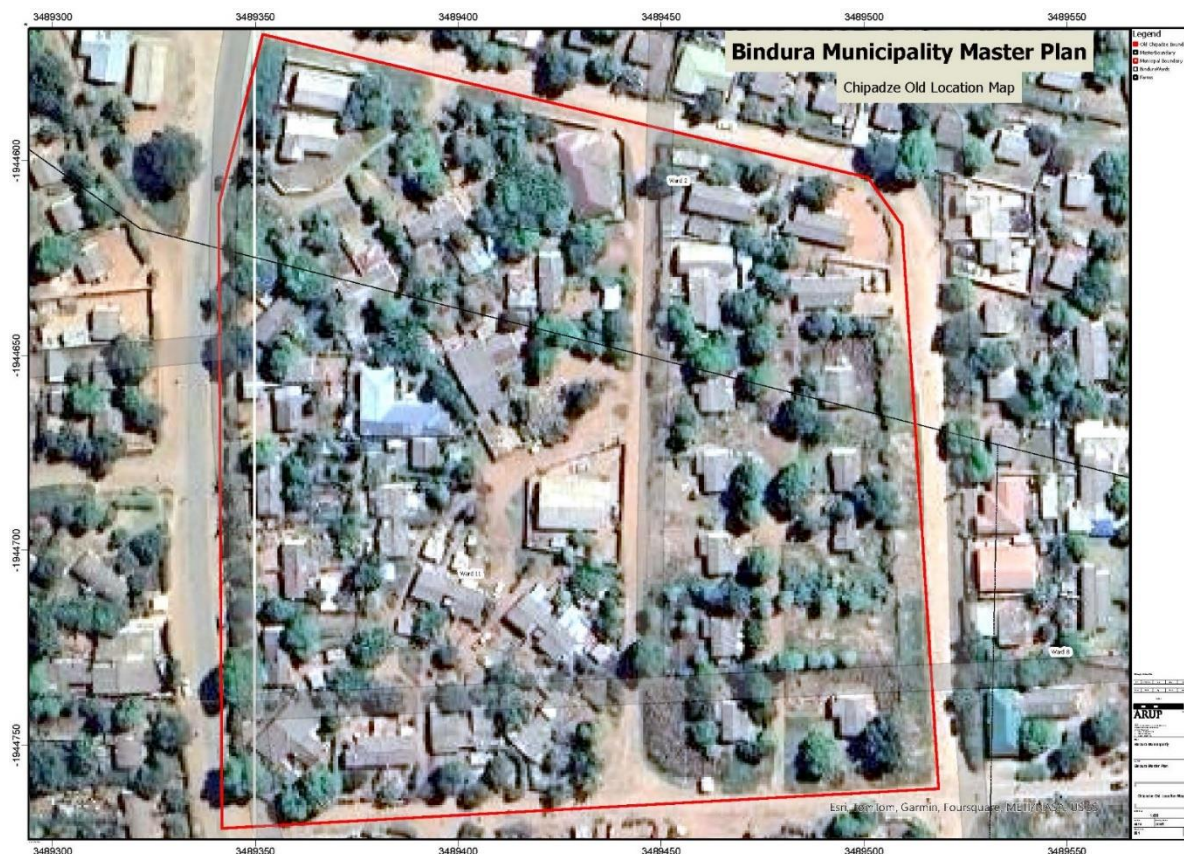
With the passage of time; Chipadze Old Location did not expand since inception and yet continued to absorb many generations in the waves of population increase. Settlement problems continue to grow. “Densification of development and the factor of multiple occupancy has resulted in the deterioration of service and infrastructure through age, overload and misuse. The present depressed

condition of the township and decay of infrastructure are a danger to public health, safety and amenity;” (Department of Physical Planning 1993: 4). In view of this, the Chipadze Old Relocation Redevelopment Plan was put in place in 1993 by the then Bindura Town Council with the prime objective of ‘upgrading, redesigning and redevelopment of the township.’ It is in that context that the 1996 Bindura Master Plan; under Policy 4.6, prioritised the following:

- i. Extension of water supply to individual households in the single quarters of Chipadze, where communal water points remain in place
- ii. Provide individual ablution facilities to households in the single quarters of Chipadze and abolish the provision of communal facilities; and
- iii. Upgrade the existing sewerage reticulation system to meet the upsurge associated with future development in residential and industrial areas

As discussed in Chapter 1, the set priorities were not accomplished, and yet the situation on the ground has continued to deteriorate. Overtime, significant efforts were made to upgrade the settlement as articulated in the Redevelopment Plan of 1993, but the work was never completed. Block 63, with less than 150 residential stands remains undone. Photos 8.1 show the gravity of the situation is on the ground.

Insert 8-1: An Extract from Chipadze Old Location



Source: Google Earth Images, October 2023

INSERT CHIPADZE MAP

Picture 8-1: Illustration of a House and Toilet in Old Chipadze Location



Source: Fieldwork 7 May 2024

Picture 8-2: and Picture 8-3: Illustration of a House and Toilet in Old Chipadze Location



Source: Fieldwork 7 May 2024

Picture 8-4: A Communal Tap in Old Chipadze Location



Source: Fieldwork 7 May 2024

Picture 8-5: Cracked structures in Old Chipadze Location



Picture 8-6: Waste-water flow in Chipadze Old Location



Source: Fieldwork 7 May 2024

8.4 Institutional Actors in Housing

The 1996 operative Master Plan states that ‘Government has about 66 houses, ZESA has 50, NRZ has 17, Cluff Minerals has 99, AFC has 11...;’(p 22). Additionally; the operative Master Plan indicates that “Housing development through other schemes such as self-help, USAID, World Bank, Co-operatives, building brigades etc. has been insignificant. In 1989, only 90 houses were developed under the self-help scheme, and about 270 units by USAID. No other housing development schemes have been undertaken. The Local Authority's latest major housing development was in 1989/90 when Chiwaridzo medium/high density suburb was developed;’ (p22). Table 8.4 shows the current situation in terms of institutions that own houses in Bindura Town. A new player is the Bindura University of Science Education which purchased 33 houses from URDCORP (Figure 8.1 refers).

Table 8-4: House Ownership by Type of Institution in Bindura town

Name of Institution	Number of Houses owned
1. Trojan Nickel Mine	174
2. Ashanti Gold Fields	106
3. Bindura University of Science Education	33
4. Cotton Company	10
5. Grain Marketing Board	1
6. Government Departments	50
7. SOS	37

8. Min of Public Works & National Housing	31
9. Bindura Municipality	18
10. ZESA	9
11. National Railways of Zimbabwe	12
12. Totals	481

Source: Bindura Municipality Records; June 2024

Figure 8-1: Garden Flats Located close to the CBD; originally UNDCORP; but purchased by BUSE; Source: Google Earth Mapping, May 2024



8.5 Delivery of Residential Stands

Based on the operative Master Plan of 1996; the Waiting List for High Density and Medium Density Residential Stands stood at 6000 and 3000 respectively. Table 8.4 shows the trends of the Housing Waiting List for the period 2019 – 2023. What is evident is the rising trend of the Waiting List despite the delivery of residential stands as presented in Table.

For the period 1996-2023; an estimated 10 817 residential stands were delivered over a 27 year period (Table 8.5 refers). It is noticeable that the total number of residential stands supplied over a 27 year of period is actually less than the current figures on the Waiting List which stands at 14 713 applicants. There was a peak in the delivery of housing stands in the year 2000 and 2007 when some 3708 and 3729 stands were delivered respectively. In the year 2007, the peak is explained by the privately owned Brookdale Layout which supplied 3630 residential stands, composed of the both high, medium and low density stands. In 2007, the Woodbrook Destiny Layout supplied 3 729 residential stands. Over the same period of 1996-2023, there was no delivery of new residential stands for many years. In fact; there was no delivery of housing stands for the years 1996-1998; 2003, 2006, 2008, 2011, 2014-2015; 2017-2022. Effectively for the period spanning over 27 years, there was no delivery of housing stands for 16 of those years; while only 2 residential stands were delivered in the year 2023. Figure 8.1 shows the trends on housing stands delivery over the period 1996-2023.

Table 8-5: Waiting List for Residential Stands (2019 – 2023)

YEAR	NUMBER OF APPLICANTS
DECEMBER 2019	12 258
DECEMBER 2020	12 654
DECEMBER 2021	12 962
DECEMBER 2022	13 761
DECEMBER 2023	14 713

Source: Bindura Municipality 2024

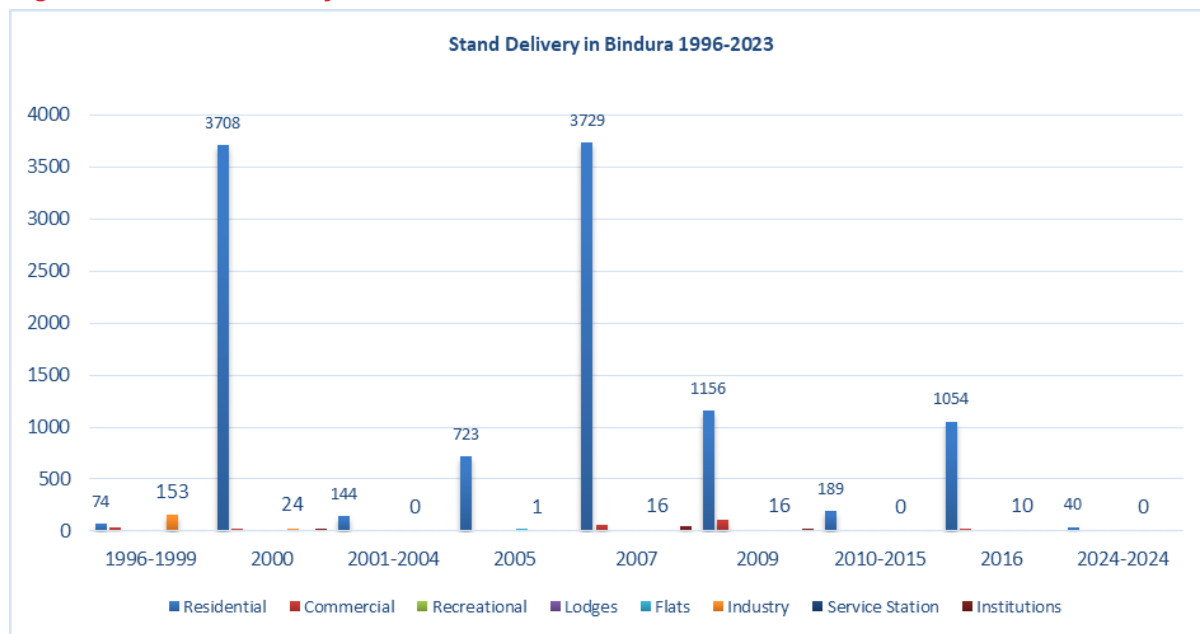
Table 8-6: Stand Delivery in Bindura Town: 1996-2023

Year	Residential	Commercial	Recreational	Lodges	Flats	Industry	Service Station	Institutions
1996-1999	74	37	0	0	0	153	2	5
2000	3708	22	0	1	0	24	0	18
2001-2004	144	0	0	0	1	0	0	5
2005	723	13	1	1	23	1	1	14
2007	3729	61	0	0	0	16	0	48

2009	1156	111	1	1	1	16	2	19
2010-2015	189	6	0	0	0	0	0	3
2016	1054	19	0	0	0	10	1	6
2024-2024	40	0	0	0	0	0	0	1
Total	10817	269	2	3	25	220	6	119

Source: Bindura Municipality Data 2024

Figure 8-2: Stand Delivery in Bindura Town 1996-2023



In the context of the fore-going discussion, the supply side for housing stands has not matched the demand side. This is not surprising because as discussed in Chapter 1 and elsewhere in this Report, most of the land zoned for residential development under the 1996 Master Plan was land under mining claims. In the end, the affected land became unavailable for housing development. In the year 2024, there is the privately owned Artherstone Layout Plan under preparation, which seeks to deliver about 751 residential stands (Table 8.6 refers).

Table 8-7: Layouts Under Preparation: Artherstone

Schedule of Stands for Artherstone Layout Plan	
Land Use	Stand Numbers
Flats	1
Medium Density	743
High Density	8
Commercial	38
Total Residential Stands	751
Service Industrial	1
Primary Schools	1
PFS	2
Churches	1
Crèches	1

Clinics	1
Local Authority	2
Parking	
Open Space & Recreational	2

Source: Bindura Municipality 2024

8.6 Key Planning Issues in the Housing Sector

- **Need for increased delivery of land for housing development.** Bindura Town has run out of land available for development. The acquisition of new land for various land uses is a key priority.
- **Upgrading of Old Chipadze Houses.** As discussed in various sections of the Report, the physical condition of houses in the Old Chipadze location needs urgent upgrading, together with improved delivery of sanitation services. As argued in the 1996 Master Plan, the reconstructed houses will require individual water supply and reticulated sewer services.
- **Improved service delivery.** There are areas that lack water and sewer services. A case in point is the Garikayi Housing Scheme.
- **Development of appropriate data bases for sound decision making.** In general; management of housing information needs significant improvement. As an illustration, the current Valuation Roll was put in place in the year 2015, and contains information that is not readily useable to aid decision making. Urgently required is a more refined data base, with adequately framed variables that include; among other issues; housing stock by residential area; residential stands by area, stage of construction and Layout Details. The data from the Valuation Roll that was presented in Chapter does not show how houses are considered complete in Bindura Town. Neither does the data show how many stands remain vacant and since when.

A new trend towards the development of Boarding Houses has emerged. In response to increased accommodation requirements of University Students, the market has responded through the establishment of Boarding Houses. Yet, not much is known about this trend and how it is taking shaping. The issue of servicing and the carrying capacity of such Boarding Houses are yet to be established.

Chapter 9 : Infrastructure

9.1 Background

This section outlines the findings observed from the assessment of the existing infrastructure and analysis of already published WATSAN reports for Bindura in April 2024. The infrastructure assessment team completed targeted stakeholder interviews, toured the water, sanitation, and transport infrastructure, and analysed the existing physical conditions.

The synthesis and analysis of these various data sources outlined in this report, informed the infrastructure development proposals delineated in the written statement.

9.1.1 Limitations

Limiting factors encountered during the infrastructure data analysis and review include the following:

- There were no digital records of the as-built infrastructure layouts.
- No traffic data was available.

9.2 Hydrological Catchments and Zones

Table 9.1 summarises the catchment areas and the extent of the catchment boundary. Refer to catchment layout under Appendix A1. The altitude of the planning area varies from 1020 metres to 1140 metres. Majority of the streams flow towards the Mazowe River north of the study boundary while the other rivers flow southeast of the study boundary. The area is mostly flat and open, with some rocky hills (kopjes) and dwalas scattered throughout.

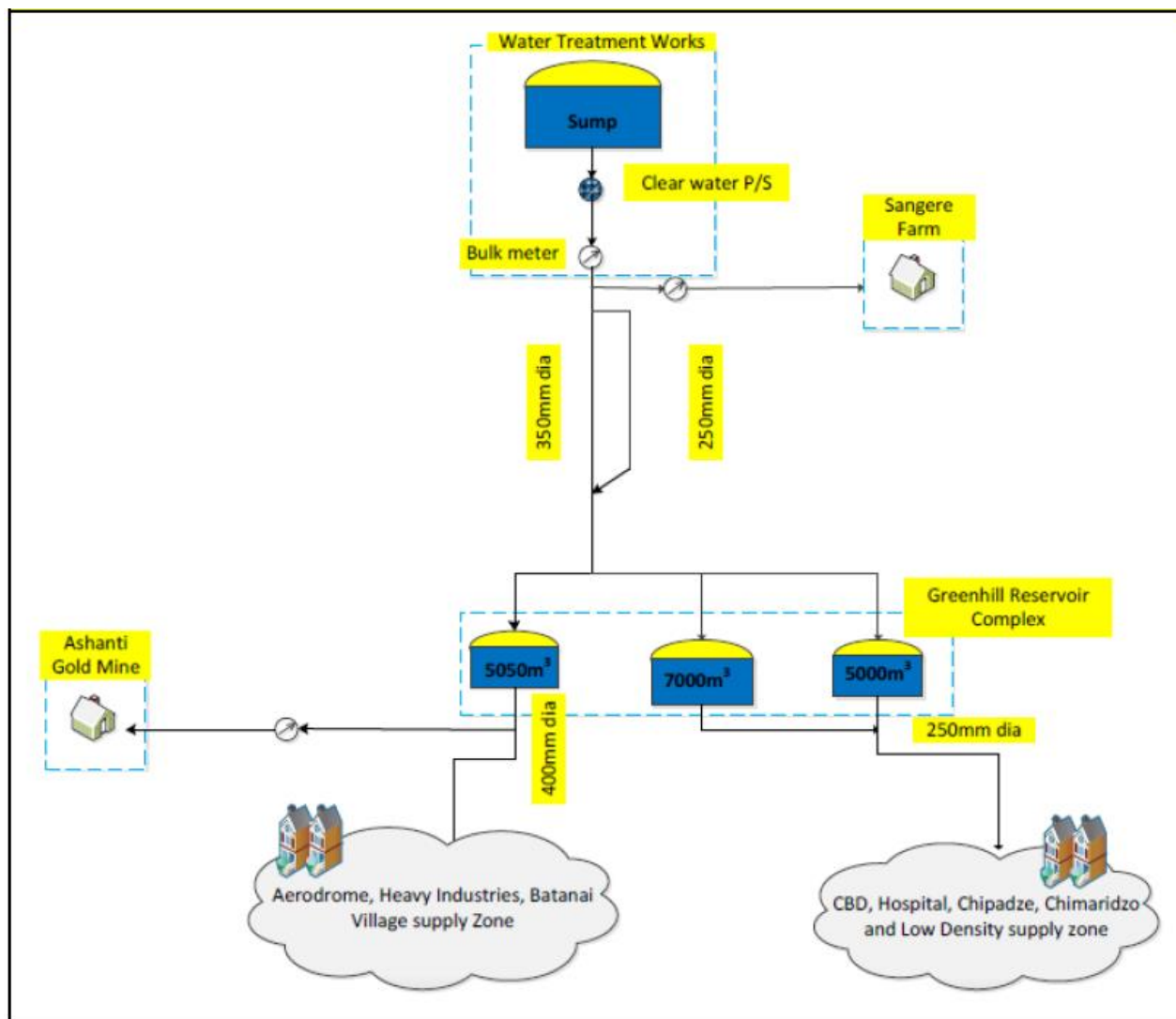
Table 9-1: Catchment Areas

Catchment IDs	Area (Ha)
C1	3051
C2	2837
C3	1451
C4	888
C5	956
C6	414
C7	606
C8	451

9.3 Existing Water Infrastructure

Bindura has one raw water abstraction point, one water treatment plant and reservoir site housing three reservoirs. Figure 9.1 shows a schematic layout of the existing water supply infrastructure.

Figure 9-1: Schematic of Bindura Water Supply System



9.3.1 Water Sources

The Municipality of Bindura sources its water entirely from a diversion weir constructed on the Mazowe River, a tributary of the perennial Zambezi River system. This weir diverts water from the Mazowe River to meet the municipal water needs, ensuring a reliable supply. The system supports the town's domestic, industrial, and agricultural water requirements. Regular maintenance of the weir is crucial to sustain the water flow, particularly during dry seasons when river levels may drop. Additionally, the reliance on this single source highlights the need for efficient water management practices to prevent shortages and ensure long-term water security for Bindura. The municipality is also exploring potential improvements to the water infrastructure to enhance capacity and resilience against climatic variations.

9.3.2 Abstraction

Bindura draws its water from the Mazowe River via a weir. The Zimbabwe National Water Authority (ZINWA) manages the raw water supply and maintains the intake infrastructure. Pumps housed in

pumphouse located from the river abstract water to the water treatment plant located 500 m from the abstraction point through a 400mm steel pipe which branches into two pipelines i.e. a 350 mm steel pipeline and 250 mm AC pipeline 10 m from the pumphouse. The pumps are operated for 5-6 hours daily.

While the raw water pump station itself is in good condition, there are some maintenance concerns. These include inadequate lifting equipment for the pump sets and leaking Non-Return Valves (NRVs) on the pump delivery lines. Additionally, leaks have been identified in the scour valves on the raw water pipelines supplying the treatment plant.

There are no flow measurement meters at the abstraction point. Volume abstracted is estimated from pump rates and duration of pumping. In addition, a bulk flow meter at the inlet of the WTW is used to measure raw water inflow into the WTW. The meter is in fairly good condition. The current water demand for Bindura is between 8.4 – 12 ML/d whereas the current supply is estimated to be 9ML//d indicating the inadequacy or inefficiency of the water supply system to meet the current demand.

Table 9.2 highlights the various effluent parameters as per the EMA regulations of 2007.of the raw water from the Mazowe River. These show that the quality of raw water abstracted from the Mazowe River is within the acceptable category of the EMA.

Table 9-2: EMA (Effluent and Solid Waste Disposal) Regulations 2007

Parameter	Units	Method	Blue (Sensitive)	Blue (Normal)	Green	Yellow	Red
Biological Oxygen Demand (BOD)	mg/l	Electrode SOP/CM03	≤15	≤30	≤50	≤100	≤120
Dissolved Oxygen	Saturation %	Electrode SOP/CM10	≥75	≥60	≥50	≥30	≥15
E. Conductivity	uS/cm	Electrode SOP/CM12	≤200	≤1000	≤2000	≤3000	≤3500
Iron	mg/l Fe	AAS Flame SOP/CM22	≤0.3	≤1	≤2	≤5	≤8
Manganese	mg/l Mn	AAS Flame SOP/CM22	≤0.1	≤0.1	≤0.3	≤0.4	≤0.5
Nitrate	mg/l N	Spectrophotometric SOP/CM23	≤10	≤10	≤20	≤30	≤50
pH		Electrode SOP/CM27	6.0-7.5	6.0-9.0	5-6 9-10	4-5 10-12	0-4 12-14
Phosphate	mg/l P	Spectrophotometric SOP/CM23	≤0.5	≤0.5	≤1.5	≤3	≤5

The raw water abstracted from Mazowe River is generally in the within the acceptable category.

9.3.3 Raw Water Mains

The raw water main is a 400 mm diameter steel rising main which branches into two pipelines a 350 mm steel pipeline and a 250 mm AC pipeline. These pipelines are currently not being used to their

full capacity to supply the water treatment plant because of the leaks on the valves and sections of the pipelines.

9.4 Water Treatment Plant

The flowchart below outlines the treatment process at Bindura's water treatment plant (WTP), which includes sequential stages of flocculation, coagulation, clarification, filtration, and disinfection. Currently, chlorine gas is employed for disinfection, though safety concerns arise due to inadequate equipment in the chlorine gas room, necessitating upgrades or improvements.

Despite its design capacity of 14.4 mega litres per day (ML/d), the WTP's current output varies between 7.5 and 8.4 ML/d. Operational hours extend to 15 hours daily, with downtime ranging from 4 to 6 hours to accommodate maintenance and operational adjustments

While the inlet works components and clarifiers are generally in good condition, faulty clarke valves have been identified as a problem during backwash cycles, leading to significant water loss. Additionally, one of the 5 rapid gravity sand filters, measuring 3.2m x 6.4m, has collapsed and requires immediate repair. The absence of backwash flow meters further complicates efforts to monitor and optimize the filter cleaning process.

Bindura's WTP features a clear water well with a capacity of 10 ML cubic meters, serving as a storage reservoir before treated water is pumped to storage tanks via four high-lift pumps. Although the well and pumps are operational, leaks have been detected in VJ couplings and malfunctioning valves along the pumping mains exiting the WTP, necessitating prompt repairs to minimize treated water loss and ensure the efficient operation of the pumping system.

These technical challenges underscore the critical need for infrastructure upgrades and maintenance to enhance the reliability, efficiency, and safety of Bindura's water treatment and distribution system.

9.5 Existing Bindura Water Demand Analysis

Table 9.3 shows the Water Demand and the Average Dry Weather Flow for the various land uses in Bindura. The WATSAN analysis was done to determine adequacy of existing bulk water infrastructure and adequacy of existing storage reservoirs.

Location	Land Use	Area	Quantity	No. of (stands/ employees /travellers /beds /Area)	Units	Unit Water Demand Per Land-Use	Units	Annual Average Daily Water Demand (AADD)	Distribution Losses (15%)	Water Treatment Losses (10%)	GAADD	Potable Water	Raw Water
		Ha						l/d	l/d	l/d	l/d	l/d	l/d
Bindura Area	Open Spaces	167.17962	23	167.1796	Hectares	10,000	l/Ha/d	1,671,796	250,769	222,906	2,229,062	2,006,155.44	2,229,062
	Industrial	104.0694	220	104.0694	Hectares	10,000	l/Ha/d	1,040,694	156,104	138,759	1,387,592	1,248,832.80	1,387,592
	Recreational	101.8895	2	101.8895	Hectares	10,000	l/Ha/d	1,018,895	152,834	135,853	1,358,527	1,222,674.00	1,358,527
	University		2	5,000	members	30	l/member/d	300,000	45,000	40,000	400,000	360,000.00	400,000
	Secondary School		7	10	students	30	l/student/d	2,100	315	280	2,800	2,520.00	2,800
	Primary School		11	2	students	30	l/student/d	660	99	88	880	792.00	880
	Private School		2	2	students	30	l/student/d	120	18	16	160	144.00	160
	Hospital		1	4	patients	15	l/patient/d	60	9	8	80	72.00	80
Greenhill T/S	Low density		712	712	Stands	1,200	l/stand/d	854,400	128,160	113,920	1,139,200	1,025,280.00	1,139,200
	Commercial		13	13	Employees	30	l/member/d	5,070	761	676	6,760	6,084.00	6,760
	Lodges		1	0	beds	800	l/bed/d	14	2	2	19	16.80	19
	Flats		16	16	units	900	l/unit/d	14,400	2,160	1,920	19,200	17,280.00	19,200
	Service Station		1	40	Employees	30	l/employee/d	1,200	180	160	1,600	1,440.00	1,600
	Institution		14	14	Stands	10,000	l/stand/d	140,000	21,000	18,667	186,667	168,000.00	186,667
Claverhill	Low density		1050	1,050	Stands	1,200	l/stand/d	1,260,000	189,000	168,000	1,680,000	1,512,000.00	1,680,000
	Commercial		41	13	Employees	30	l/member/d	15,990	2,399	2,132	21,320	19,188.00	21,320
	Lodges		1	0	beds	800	l/bed/d	14	2	2	19	16.80	19
	Flats		1	16	units	900	l/unit/d	14,400	2,160	1,920	19,200	17,280.00	19,200
	Service Station		1	40	Employees	30	l/employee/d	1,200	180	160	1,600	1,440.00	1,600
	Institution		19	19	Stands	10,000	l/stand/d	190,000	28,500	25,333	253,333	228,000.00	253,333
Chipindura Infills	Medium density		15	15	Stands	900	l/stand/d	13,500	2,025	1,800	18,000	16,200.00	18,000
Matepa tepa RD Low density	Low density		11	11	Stands	1,200	l/stand/d	13,200	1,980	1,760	17,600	15,840.00	17,600

	Flats		7	7	Units	900	l/unit/d	6,300	945	840	8,400	7,560.00	8,400
Chipadze high density infills	High density		56	56	Stands	850	l/stand/d	47,600	7,140	6,347	63,467	57,120.00	63,467
Chipindura Medium Infill	Medium density		56	56	Stands	900	l/stand/d	50,400	7,560	6,720	67,200	60,480.00	67,200
	Institution		1	1	Stands	10,000	l/stand/d	10,000	1,500	1,333	13,333	12,000.00	13,333
Morningside Low Density	Low density		65	65	Stands	1,200	l/stand/d	78,000	11,700	10,400	104,000	93,600.00	104,000
Woodbrook Council Area	High density		764	764	Stands	850	l/stand/d	649,400	97,410	86,587	865,867	779,280.00	865,867
	Commercial		11	13	Employees	30	l/member/d	4,290	644	572	5,720	5,148.00	5,720
	Service Station		1	40	Employees	30	l/employee/d	1,200	180	160	1,600	1,440.00	1,600
	Institution		3	3	Stands	10,000	l/stand/d	30,000	4,500	4,000	40,000	36,000.00	40,000
Woodbrook Density area	High density		3861	3,861	Stands	850	l/stand/d	3,281,850	492,278	437,580	4,375,800	3,938,220.00	4,375,800
	Commercial		61	13	Employees	30	l/member/d	23,790	3,569	3,172	31,720	28,548.00	31,720
	Institution		40	40	Stands	10,000	l/stand/d	400,000	60,000	53,333	533,333	480,000.00	533,333
Woodbrook Civil Servants Area	Medium density		290	290	Stands	900	l/stand/d	261,000	39,150	34,800	348,000	313,200.00	348,000
	Commercial		8	13	Employees	30	l/member/d	3,120	468	416	4,160	3,744.00	4,160
	Institution		4	4	Stands	10,000	l/stand/d	40,000	6,000	5,333	53,333	48,000.00	53,333
Aerodrome Medium Density infills	Medium density		33	33	Stands	900	l/stand/d	29,700	4,455	3,960	39,600	35,640.00	39,600
	Institution		2	2	Stands	10,000	l/stand/d	20,000	3,000	2,667	26,667	24,000.00	26,667
Low density residential infill (Hay Road East)	Low density		14	14	Stands	1,200	l/stand/d	16,800	2,520	2,240	22,400	20,160.00	22,400
	Flats		1	1	Units	900	l/unit/d	900	135	120	1,200	1,080.00	1,200
	Institution		4	4	Stands	10,000	l/stand/d	40,000	6,000	5,333	53,333	48,000.00	53,333
Low density residential infill (Hugh Gundry)	Low density		13	13	Stands	1,200	l/stand/d	15,600	2,340	2,080	20,800	18,720.00	20,800
Amendment of Claverhill Layout	Low density		38	38	Stands	1,200	l/stand/d	45,600	6,840	6,080	60,800	54,720.00	60,800
	Institution		1	1	Stands	10,000	l/stand/d	10,000	1,500	1,333	13,333	12,000.00	13,333
Low density (Shashi Infill)	Low density		34	34	Stands	1,200	l/stand/d	40,800	6,120	5,440	54,400	48,960.00	54,400

Commercial Infill bus terminus (food court)	Commercial		2	13	Employees	30	l/member/d	780	117	104	1,040	936.00	1,040
Low density area infills (Hugh Gundry)	Low density		32	32	Stands	1,200	l/stand/d	38,400	5,760	5,120	51,200	46,080.00	51,200
Low Density Infills (Near BUSE residence)	Low density		18	18	Stands	1,200	l/stand/d	21,600	3,240	2,880	28,800	25,920.00	28,800
Remainder of Claverhill	Low density		72	72	Stands	1,200	l/stand/d	86,400	12,960	11,520	115,200	103,680.00	115,200
	Institution		3	3	Stands	10,000	l/stand/d	30,000	4,500	4,000	40,000	36,000.00	40,000
Chipadze Musika Commercial Infills	Commercial		6	13	Employees	30	l/member/d	2,340	351	312	3,120	2,808.00	3,120
Shashi Infill	Low density		44	44	Stands	1,200	l/stand/d	52,800	7,920	7,040	70,400	63,360.00	70,400
Shashi view south infill	Low density		27	27	Stands	1,200	l/stand/d	32,400	4,860	4,320	43,200	38,880.00	43,200
Low density subdivision of 1017	Low density		15	15	Stands	1,200	l/stand/d	18,000	2,700	2,400	24,000	21,600.00	24,000
Chiwaridzo 2 Commercial	Commercial		12	13	Employees	30	l/member/d	4,680	702	624	6,240	5,616.00	6,240
Chipadze Bus terminus layout	High density		46	46	Stands	850	l/stand/d	39,100	5,865	5,213	52,133	46,920.00	52,133
	Commercial		18	13	Employees	30	l/member/d	7,020	1,053	936	9,360	8,424.00	9,360
	Lodges		1	1	Units	800	l/bed/d	800	120	107	1,067	960.00	1,067
	Institution		4	4	Stands	10,000	l/stand/d	40,000	6,000	5,333	53,333	48,000.00	53,333
Showground area Commercial layout	Commercial		30	13	Employees	30	l/member/d	11,700	1,755	1,560	15,600	14,040.00	15,600
	Service Station		1	40	Employees	30	l/employee/d	1,200	180	160	1,600	1,440.00	1,600
	Institution		5	5	Stands	10,000	l/stand/d	50,000	7,500	6,667	66,667	60,000.00	66,667
NSSA Area commercial layout	Commercial		58	13	Employees	30	l/member/d	22,620	3,393	3,016	30,160	27,144.00	30,160
	Service Station		1	40	Employees	30	l/employee/d	1,200	180	160	1,600	1,440.00	1,600
Brookdale (Private Developer)	High density		3630	3,630	Stands	850	l/stand/d	3,085,500	462,825	411,400	4,114,000	3,702,600.00	4,114,000

	Commercial		4	13	Employees	30	l/member/d	1,560	234	208	2,080	1,872.00	2,080
	Institution		9	9	Stands	10,000	l/stand/d	90,000	13,500	12,000	120,000	108,000.00	120,000
Chiwaridzo 1 Marimbira Area infill	High density		57	57	Stands	850	l/stand/d	48,450	7,268	6,460	64,600	58,140.00	64,600
	Commercial		3	13	Employees	30	l/member/d	1,170	176	156	1,560	1,404.00	1,560
Heavy Industrial extension	Commercial		4	13	Employees	30	l/member/d	1,560	234	208	2,080	1,872.00	2,080
	Service Station		1	40	Employees	30	l/employee/d	1,200	180	160	1,600	1,440.00	1,600
Clusters Area	Low density		17	17	Stands	1,200	l/stand/d	20,400	3,060	2,720	27,200	24,480.00	27,200
Other infills (Chiwaridzo, Chipadze and Aerodrome)	Medium density		25	25	Stands	900	l/stand/d	22,500	3,375	3,000	30,000	27,000.00	30,000
TOTAL								15,397,443	2,309,616	2,052,992	20,529,924	18,476,932	20,529,924

9.6 Bulk Sanitation Infrastructure

9.6.1 Collector, trunk and outfall sewers

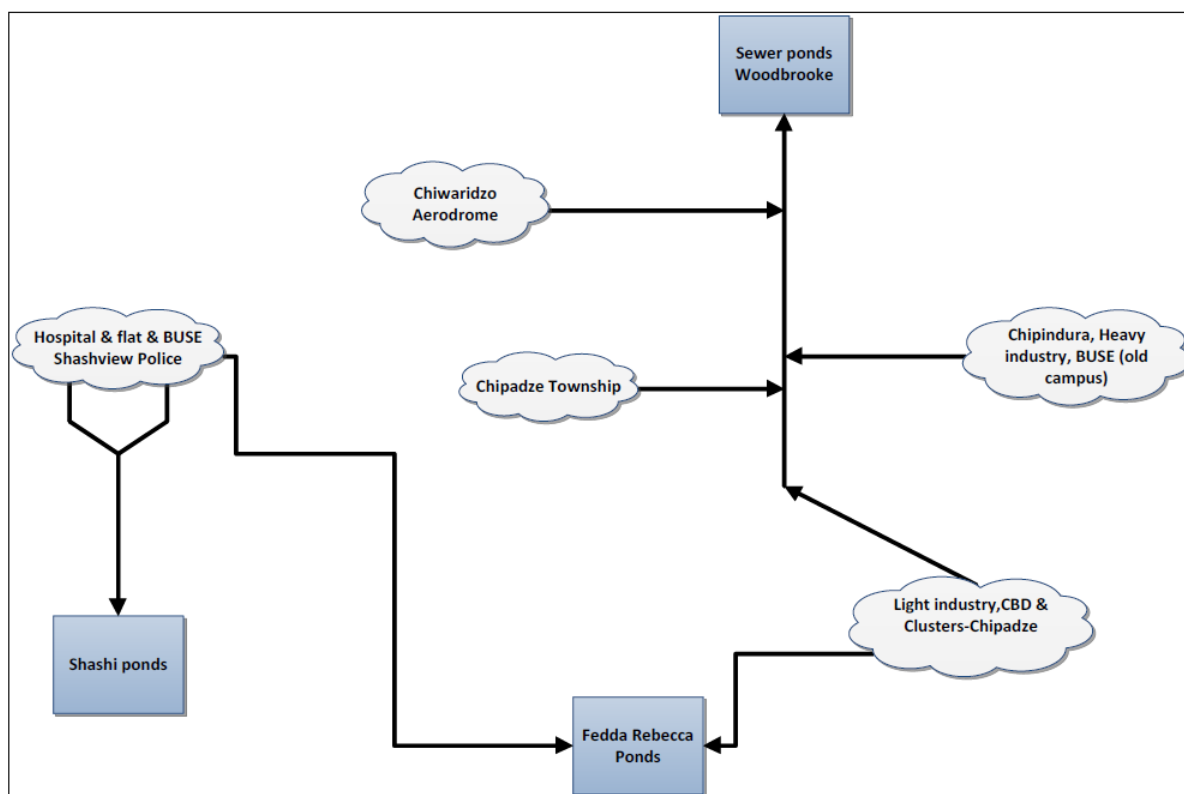
Parts of the existing collector and trunk sewer lines are experiencing blockages due to excessive flow. These blockages require urgent attention. While new collector sewers have been built in Chipadze, some houses in the area remain unconnected to these new lines. This negates the benefit of the new infrastructure. There are no operation and maintenance manual at the WSPs.

9.6.2 Existing wastewater treatment works.

Bindura has three sets of Waste Stabilisation Ponds (WSP), two are operational and the third one has been decommissioned. These are Woodbrooke WSPs, Freda Rebecca Mine WSPs and Shashi WSP respectively. Bindura Municipality is responsible for operation and maintenance of the Woodbrooke WSP, and the Freda Rebecca Mine ponds are operated and maintained by the mine. The sludge from the Woodbrooke ponds is used for irrigation and there is also a bypass for discharge directly into the river.

Despite having sufficient capacity for incoming wastewater, the Woodbrooke WSPs lack a formal water quality monitoring program. Recent independent testing, however, revealed concerning high levels of COD (Chemical Oxygen Demand) and TDS (Total Dissolved Solids) in the ponds.

Figure 9-2: Schematic of wastewater reticulation



9.6.3 Woodbrooke Effluent pump station

The pump station building is well-maintained; however, the pumps and motor are not operational. This non-functionality impacts water supply efficiency and reliability, potentially causing disruptions in service. Additionally, it may lead to increased maintenance costs and require immediate attention to restore full functionality and ensure uninterrupted service.

9.6.4 Woodbrooke Holding Dam

The holding dam receives treated effluent water from the ponds for irrigation use. It is a well-constructed earth embankment measuring 120 meters long, 100 meters wide, and 4.5 meters deep, capable of storing a significant volume of water. Water enters the dam through a large manhole, 1050 millimetres in diameter, and is gravity-fed out through a 225 mm asbestos cement (AC) pipe, which is currently in good working order. The system ensures a steady flow of water for irrigation, supporting local agricultural activities. Additionally, negotiations for irrigation to farmland are already in progress with farm owners, aiming to enhance agricultural productivity and sustainability, reduce reliance on conventional water sources, and promote the use of recycled water in farming practices. This initiative also aligns with environmental conservation efforts and sustainable water management strategies.

9.7 Public facilities and vulnerable members of the community

Table 9-3: Public Facilities Components

System Component	2012 Observations
Bindura Bazaar Public Toilets	Fairly busy area near a small commuter omnibus rank but the public toilet is closed and has no operational flushing cisterns
	Waste chambers blocked and pipe to sewer main blocked
	No overhead water storage tank and no hand washing facilities
Flea Market Public Toilets	No water storage tank for periods when reticulated water supply is unavailable.
	No flushing facilities, cisterns not operational. Bucket system now being used.
Main Bus Terminus Public Toilets	Most waste chambers blocked and there is a bad blockage on the line from the toilets to the sewer main.
	Toilets have squat pans of which, most are blocked, all cisterns have been vandalised and are no longer operational
	There is no standby overhead water storage at these toilets for periods when the reticulated water is not available.
	No hand washing facilities
Chipadze Clinic	Toilets meant for the public at this clinic have been closed. They are currently full of waste.
	The toilets are squat pans which are not good for sick people and pregnant women
	This set of toilets has no standby water for periods when the reticulated supply is unavailable.

System Component	2012 Observations
	No hand washing facilities for the external toilets
Chipadze /Chiwaridzo Sewer Reticulation	Streams of raw sewage flowing in the streets, in-between housing stands and, in some cases, right outside residents' backdoors

9.8 Solid waste management

Bindura Municipality is responsible for managing solid waste in Bindura. Their current disposal site dating back to 1994 is a disused mine dump operated by Freda Rebecca Mine Bindura Municipality has identified a location for a new landfill and is currently working to secure the land.

9.9 Transportation Infrastructure

9.9.1 Roads Network

Most roads in Bindura Municipality, managed jointly by the Department of Roads and Bindura Municipality, vary in condition from well-maintained to requiring rehabilitation. The total road network spans approximately 150.21 km, comprising over 69 trafficable roads that include regional and tertiary feeder routes.

Key road networks, such as the Harare - Mt Darwin, Bindura - Shamva, Bindura - Mt Darwin, Athestone, and Masembura - Bindura roads, play pivotal roles in local transportation and regional connectivity. However, some sections are experiencing challenges like potholes, uneven surfaces, and erosion, particularly during the rainy season. Efforts to improve road infrastructure are ongoing to enhance safety, reliability, and overall road conditions throughout Bindura Municipality. Refer to **Appendix A4**

9.9.2 Major Transport Routes

Table 9-4: Major Transport Routes

Road ID	Road Name	Road Category	Surfaced Length (km)	Unsurfaced Length (km)	Condition
R1	Harare -Mt Darwin	Regional	13		Rehabilitation required
R2	Bindura - Shamva	Secondary	9		Rehabilitation required
R3	Athestone Road	Tertiary	1.3	8.5	Rehabilitation required
R4	To Ashanti Mine	Tertiary	5	0.5	Rehabilitation required
R5	Masembura- Bindura	Tertiary	3		Minimum Rehabilitation required
R21	To Mapunga/Insingizi Farm	Tertiary	1.5	6	Rehabilitation required

9.9.3 Visual Condition Assessment of Road Junction and Intersection

The road network covers most of the boundary, with the majority of the roads being surfaced and gravel. Most of the gravel roads are trafficable, but the major regional roads require rehabilitation and maintenance

Table 9-5: Existing Junctions and Intersections Upgrades

ID	Roads	Comment
R1	Harare - Bindura	The junction adequately accommodates the traffic.
R1	Bindura - Mt Darwin	The junction adequately accommodates the traffic.
R2	Bindura - Shamva	The junction adequately accommodates the traffic.

9.9.4 Bus/Omnibus Terminus

There is one main operational terminus in Bindura located at coordinates 323459.35 m E and 8084837.57 m S. Additional operating bus termini include:

- a) Tm bus terminus
- b) Bindura Showground
- c) Ok Supermarket
- d) Gain Wholesales

These termini serve as crucial nodes for public transportation within Bindura. However, there is a pressing need to improve these bus termini to enhance efficiency and comfort for commuters. Currently, facilities such as shelters, seating areas, and information displays are limited or outdated, impacting passenger experience. Improved infrastructure would not only provide better amenities but also contribute to a more organized and safe transport environment. Furthermore, enhancing these termini

9.10 Other Modes of Transport

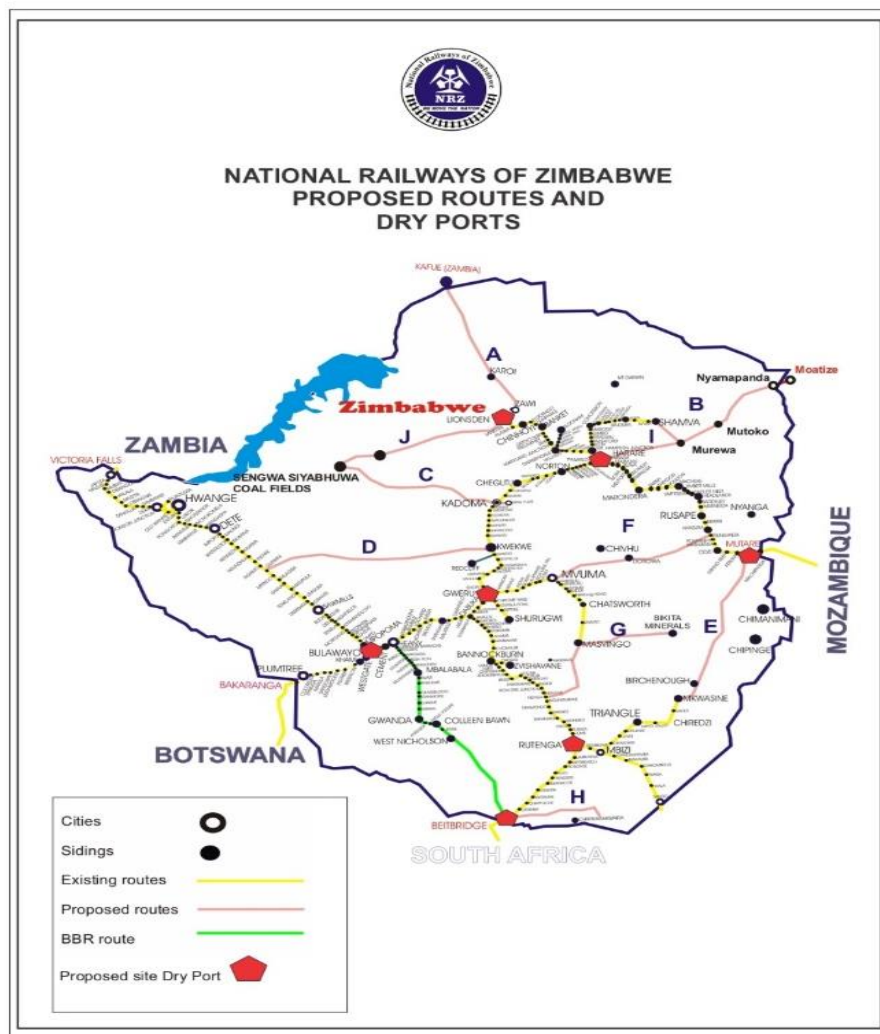
9.10.1 Railway

There is an existing railway line passing through the district from Harare to Shamva. This railway is vital for transporting agricultural inputs such as grain and cotton, as well as mining materials including sulphur, granite, coal, and chrome. The railway branches off at 322564.69 m E and 8085300.72 m S to Trojan Nickel and Bindura Nickel Mine along Masembura – Bindura Road.

However, it's important to note that some sections of the railway have been damaged by underground artisanal mining activities. These informal mining operations can undermine the integrity of the

railway infrastructure, posing safety risks and affecting the efficiency of freight transport. Efforts to secure and rehabilitate these sections are crucial to maintain the railway's functionality and ensure safe and reliable transportation of goods in the region.

Figure 9-3: NRZ Existing and Proposed Routes



9.10.2 Aerodrome

There is no active aerodrome within the study boundary, which limits air transport options and may impact emergency response times, accessibility for certain logistics and business operations, and overall connectivity to other regions. The absence of an aerodrome also affects potential for economic development and tourism, as air travel remains a crucial component for attracting investment and visitors

9.11 Telecommunications

All mobile telecommunication service providers are available in Bindura, providing comprehensive coverage across the town and its surrounding areas. This accessibility ensures residents and businesses have a choice of network providers, supporting reliable voice and data communication services. The presence of multiple providers fosters healthy competition, potentially leading to improved service quality, network expansion, and affordability of telecommunications services in Bindura

9.12 Electricity

The existing substation for Bindura is located at coordinates 327456.29 m E and 8085445.14 m S (WGS 84 UTM). This substation has a specified capacity and currently serves various areas within Bindura and its vicinity. It plays a critical role in distributing electrical power to residential, commercial, and industrial sectors, ensuring reliable electricity supply to meet local demand areas.

Chapter 10 : Poverty Situation and the State of Social Service Provision

This Chapter elaborates on the poverty situation in Bindura Town. It further discusses social services provision, focusing on education and health services.

10.1 Poverty Situation in Bindura Town

Based on the 2015 Poverty Atlas⁹; the average poverty prevalence for Bindura Urban was 63.2%; with Ward 02 having the highest poverty prevalence of 51% while Ward 01 had the lowest poverty prevalence of 29%. This compares with an average provincial poverty prevalence of 75.5%. Table 10.1 shows poverty statistics of Bindura Town based on the 2015 Poverty Atlas; with Figure 10.1 showing the graphic representation of poverty prevalence at ward level.

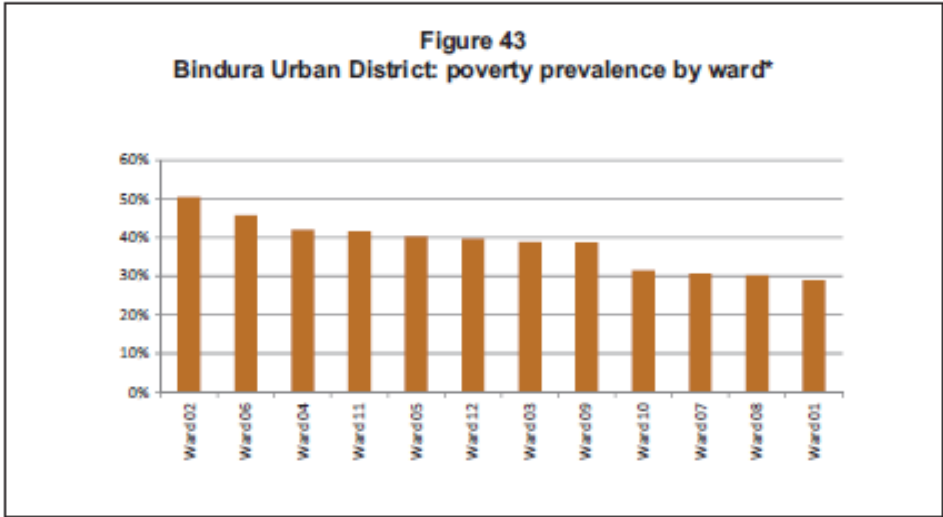
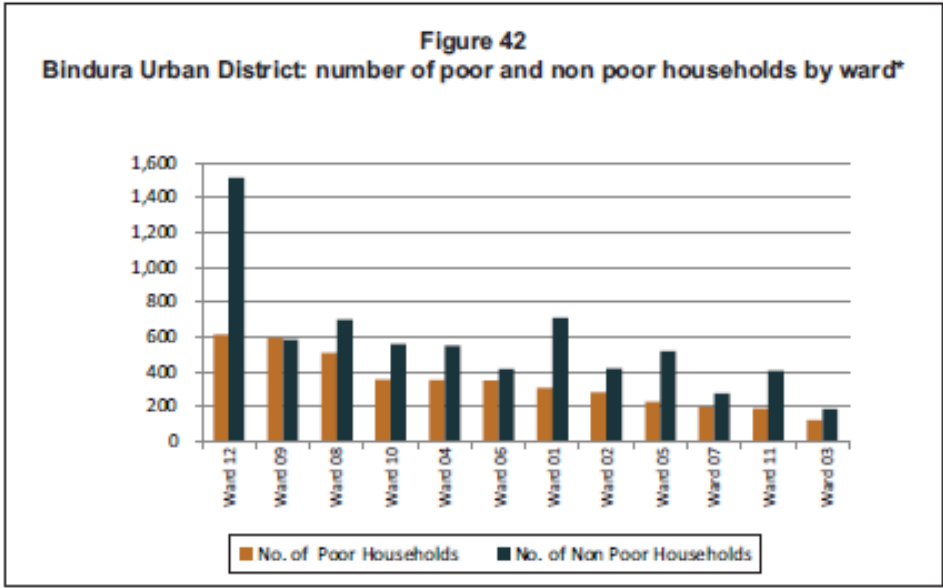
Table 10-1: Poverty Prevalence in Bindura Town

Ward No	Population	No. of HHs	No. of Poor HHS	No. non-poor HHs	Average HH Size	% Poverty Prevalence
1	4 099	1 015	293	722	4.0	28.9
2	2 711	699	353	346	3.9	50.5
3	1 070	306	119	187	3.5	38.9
4	3 413	901	379	522	3.8	42.0
5	2 950	746	301	445	4.0	40.3
6	3 227	764	349	415	4.2	45.7
7	1 812	467	143	324	3.9	30.6
8	4 757	1 207	364	843	3.9	30.2
9	4 601	1 178	456	722	3.9	38.7
10	3 608	915	288	627	3.9	31.5
11	2 359	594	246	348	4.0	41.5
12	8 426	2 129	846	1 283	4.0	39.7
Total	43 033	10 921	4 137	6 784	4.0	

Source: 2015 Poverty Atlas for Zimbabwe

⁹ ZIMSTATS 2015; Zimbabwe Poverty Atlas; Small Area Poverty Estimation; Statistics for Poverty Eradication; Government of Zimbabwe; Harare.

Figure 10-1: Poverty Prevalence in Bindura Town in 2015



10.2 Social Services Provision

10.2.1 Education

In 1996, Bindura Town had 8 primary schools and 3 secondary schools. Of these; Government owned 1 secondary school and 1 Primary school, while council owned 3 primary schools and 2 secondary school. This means that 1 secondary school and 4 primary schools were privately owned. Currently; the town has a total of 11 primary schools and 4 secondary schools. In a space of 27 years; 3 primary schools and 1 secondary school were built in Bindura Town. In addition, it has 11 ECD facilities.¹⁰ Tables 10.2-10.4 shows the current status on the provision of schools.

¹⁰ Bindura District Food and Nutrition Security Profile 2022.

Table 10-2: Pupil Enrolment and Teacher Employment in Bindura Municipality Schools

No	Name of School	Enrolment by Year					Teacher Employment by Year				
		2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
1	Chipadze Primary	2725	2614	2361	2385	2176	75	76	77	77	90
2	Chipindura Primary	1533	1602	1762	1747	1688	44	44	45	45	44
3	Shashi View Primary	662	703	796	857	936	17	19	31	31	35
4	Ran Mine Primary	1198	1172	1058	1044	1092	30	31	30	30	31
5	Trojan Nickel Mine	1489	1537	1562	1514	1423	-	51	55	60	61
6	Brookdale Primary	-	-	671	827	940	-	-	17	17	25
7	Chipadze High School	2085	2019	2033	2033	1900	87	86	87	87	92

Source: Bindura Municipality Records; June 2024

Table 10-3: Teacher Pupil Ratio in Bindura Municipality Schools

No	Name of School	Teacher /Pupil Ratio by year				
		2020	2021	2022	2023	2024
1	Chipadze Primary	36.3	34.4	30.7	31.0	24.2
2	Chipindura Primary	34.8	36.4	39.2	38.8	38.4
3	Shashi View Primary	38.9	37.0	25.7	27.6	26.7
4	Ran Mine Primary	39.9	37.8	35.3	34.8	35.2
5	Trojan Nickel Mine		30.1	28.4	25.2	23.3
6	Brookdale Primary	-	-	39.5	48.6	37.6
7	Chipadze High School	24	23.5	23.4	23.4	20.7

Source: Bindura Municipality Records; June 2024

Table 10-4: Current Enrolment of Pupils in other Schools in Bindura Town

No	Name of School	2024 Employment	Teacher Employment	Teacher/Pupil Ratio
1	Chipindura High School	-	-	-
2	Chiwaridzo Primary School	-	-	-
3	Chiwaridzo Secondary	785	38	20.7
4	Marian Primary	727	35	20.8

5	Dawnridge Primary	106	8	13.3
6	Delmonds Academy	250	7	35.7
7	Herentals College	296	7	42.3
8.	Bindura Junior	1052	35	J30.1
9	G.H High School	-	51	-
10	H G. Primary School	-	38	-
11	Bindura Salvation Army	2129	80	26.6
12	Little Lily	290	14	20.7
13	NSII	100	7	14.3
14	Cornerstone	128	7	18.3
15	Eagle House	83	4	20.8

Source: Bindura Municipality Records, June 2024.

Table 10.5 shows the recommended teacher pupil ratio as per Government policy. Yet media reports showed that many of the Municipality Schools had a very high teacher pupil ratio. “Bindura Town has a big problem of schools which are overpopulated with the teacher- pupil ratio now too high at 1:60;” (The Herald, 1 April 2019). The situation had not changed in 2022, with media reports reporting a critical shortage of schools caused mainly by the increase in population and the opening up of new residential areas. Upon the completion of Bindura Municipality’s Brockdale Primary School in 2022 (construction had started in 2018); the Bindura Town Clerk noted that “We have a critical shortage of schools in Bindura and the schools are overcrowded. ... We have learners sheltered in an old beer-hall and our first priority is to move them to a better school;” (Herald; 27 January 2022). However, Tables 10.4 and 10.5 confirm that the teacher/pupil ratio is within the acceptable standards, thereby directly contradicting the media reports.

Table 10-5: Recommended Teacher to Pupil Ratio

School	Class	Ratio
Primary	ECD	1: 20
	Grade 1-7	1: 40
Secondary	Form 1-2	1: 33
	Forms 3 -4	1: 30
	Forms 5-6	1: 20
	Technical/Vocational Subjects	1: 100
Special Allocation	Special Class	1: 19
	Deaf and Hearing Impaired	1: 7
	Severely mentally handicapped	1: 7

	Physically handicapped	1: 10
	Blind and visually handicapped	1: 10

Source: Director's Circular Number 9 of 2012

10.2.2 Health Services

In terms of health facilities, Bindura Town has 2 clinics and 2 hospitals. The two clinics are located in Chiwaridzo and Chipadze residential areas. The two hospitals are Bindura Hospital and the Shashi Private Hospital.

Chapter 1 has alluded to the fact that under the provisions of the 1996 Master Plan; a provincial hospital site measuring 43 ha was provided for on Claverhill South. In addition, two clinic sites were proposed, one in the High Density area on Woodbroke Farm and the other on Claverhill.

10.3 Critical Planning issues

Given the prevalence of poverty in Bindura Town, it remains ideal to provide space and other ancillary services that promote the development of SMEs.

Chapter 11 : Finance and Administration

Bindura Municipality derives its revenue from within and outside the organization. Funds mobilized from within the organization include rates and charges levied by the Municipality for the services rendered to Bindura Town citizens. External funds include funding from central Government, including devolution funds.

Table 11.1 shows major sources of income for internally generated income for the Year... There are two main categories of internally generated revenue: revenue from billing and revenue from non-billable sources. The main source of revenue from billing are the Water Account and the Rates Account. Concerning the non-billable sources, the three main active accounts are Building Inspection Fees, Business License Account and the Plan Approval fees.

Table 11.2 then shows major sources of both internal and external sources income for Bindura Municipality for the years 2021-2023. Table 11.3 shows the corresponding expenditure pattern for the same period

Table 11-1:: Major Sources of Income for Internally Generated Income

Source	Percentage Contribution
Revenue from Billing	
Water Account	42.92
Rates Account	15.57
Others (refuse removal, fire and rescue account, rent, sewerage, education levy)	5.87
Non-Billable	
Building Inspection fees	8.47
Business License Account	4.95
Plan Approval fees	4.11
Stand Sales Income Account	2.89
Bus Entry Income Account	1.74
Whole Market Account	1.92
Others	11.56
Total	100.00

Bindura Municipality Records; June 2024.

Table 11-2: Major Source of Revenue 2021-2023

REVENUE	PERCENTAGE (2021)	PERCENTAGE (2022)	PERCENTAGE (2023)
GRANTS	0.10	0.05	21.99
Rates (TAXES)	1.41	0.26	0.17
WATER	63.98	94.95	9.23
SEWERAGE	1.45	0.66	6.22
REFUSE	3.03	1.26	1.64
FEES	0.17	0.51	7.03
Land Sales (ESTATES)	14.90	0.36	32.78
FINES	1.26	0.56	7.92
PANALTIES	4.37	0.05	3.47
LICENCES	9.33	1.33	9.55
	100	100	100.00

Source: Bindura Municipality Records; June 2024

Table 11-3: Bindura Expenditure 2021 -2023

Budget Item	PERCENTAGE	PERCENTAGE	PERCENTAGE
Employee costs	59	56	38
General Expenses	37	42	53
CAPEX	4	2	9
Totals	100	100	100

Source: Bindura Municipality Records; June 2024

In general, revenue generated internally is used to finance recurrent expenditure that include staff salaries, refuse removals and water supply. On the other hand; finance sourced externally is used for funding capital development projects such as infrastructure and housing development. Central Government in particular supplies loans for capital development projects.

Thus, the major sources of revenue for the Municipality of Bindura are assessment rates, supplementary charges, service charges and rents. Expenditure of the funds cover the broad areas of Employee Expenses; Loan Charges, Repairs and Maintenance, Revenue Contribution to Capital, and other running Expenses.

Over the 2021-2023 period, Bindura Municipality's capital expenditure financed the construction of Brookdale Primary School; Garikai Bridge; Flea Market and the Main Stores. The organization also acquired equipment over the same reporting period. This equipment includes: a Grader; Back-Hoe Loader; 6 small service vehicles; Tipper Truck; Refuse Compactor and Water Treatment Equipment. The proportion of the Budget spent on capital expenditure ranges from 4% in 2021; 2% in 2022 and 9% in 2023. Under such circumstances, Bindura Municipality needs to broaden and intensify revenue collection in order to make impact on implementing key provisions of the Master Plan.

11.1 Institutional Arrangements

At the top of the governance structures of Bindura Municipality is the Council, made up of elected Councillors. Below the Council is the Mayor, with the Town Clerk immediately below the Mayor. In addition to the Mayor, Town Clerk and Chamber Secretary; governance of Bindura Municipality includes 6 sub-structures. These include 4 Committees covering Environmental Management Committee, Health and Housing Committee, Human Resources Committees, Audit Committee and the Finance Committee. The sixth structure is the Procurement Board.

The rest of the employees of Bindura Municipality are employed in 5 key Departments namely Engineering Department, Health and Environmental Services Department; Administration and Secretariat Department, Housing and Community Services Department and the Treasury Department; each headed by a Director.

A major omission from the existing Organogram is the Town Planning Department and its supporting staff. Yet, the Municipality has a Town Planner in place and the support staff. For efficient and effective town planning functions to be discharged; there must be organizational clarity in terms of the placing of Town Planning and its support staff.