9

# Understanding landscape dynamics

## A case study from Kalomo District

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## 9.1 Introduction and background

The dictum "Our Wealth is Maize and Cattle" is a literal translation of the ChiTonga adage "*Buvwubi Bwesu Buli Mu Ng'ombe a Mapopwe"*(KTC 2018; SZI 2019), and aptly describes the identity of those who live in the Kalomo District. Viewed also as the *Farmers' Nest,* these statements summarize the heterogeneity and dynamics of the Kalomo District landscape and resonate with the social-economic profile of the district. The long-term strategic direction of the district is to realize economic diversification, underpinned by export-oriented agriculture, tourism and improved natural resource development and management. These sectors have the potential to spur growth and poverty reduction for the district. However, there are a number of challenges in key sectors, centered on water scarcity, unplanned settlement, land degradation and a general uncoordinated approach to addressing local problems. Climate change, planning and a lack of coordination among stakeholders have also contributed to the severity of the problems.

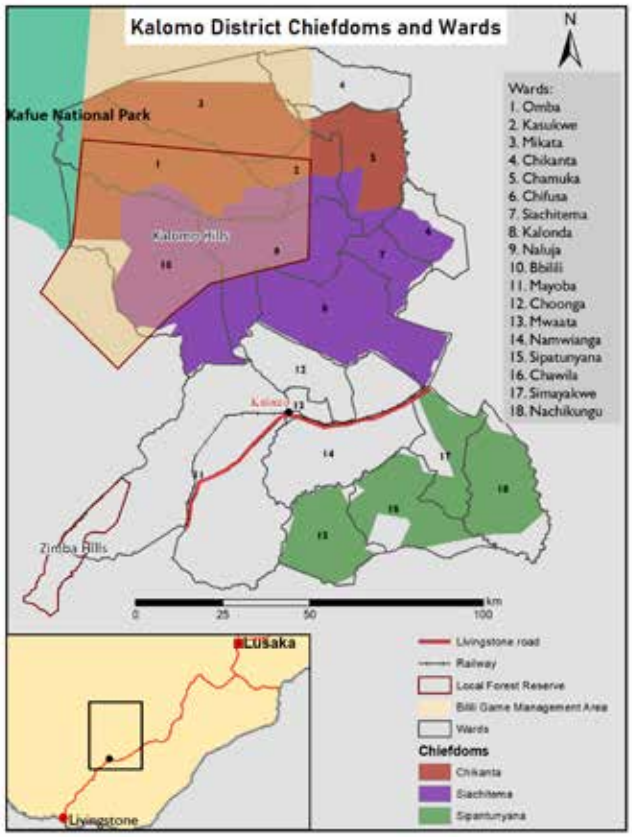


**Figure 9.1 Location and administrative map of Kalomo District.**

### 9.1.1 Kalomo District in brief

The total area of the district is 8074.84[1] km², which is located in one of Zambia's tourism corridors[2] along the T1 road. Kalomo District lies about 340 km from Lusaka and 120 km from Livingstone and is the third-largest district in the Southern Province (Figure 9.1). The administrative units for Kalomo are comprised of two political constituencies (Dundumwezi and Kalomo Central, 18 wards, and three chiefdoms, namely Chikanta, Siachitema and Sipatunyana (Chinene 2006; CSO 2011; KTC 2018).

The focus of this chapter is on characterizing the Farmers' Nest by highlighting its historical, socio-economic, and biophysical contexts (Section 9.2). The state and customary organizational and institutional setup of the district is presented and briefly analyzed, covering resource tenure, and governance structures and systems (Section 9.3). Section 9.4 covers the challenges, opportunities and options for landscape approaches and reflects on further research aspirations for the COLANDS initiative.

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1 Cf. CSO (2011, 45): 15,000 km² before Zimba became a district.

2 Attractions include the associated Old Administrator's house, wildlife in the Game Management Area and Game Ranches, camping sites (e.g. the Dundumwezi camp), Bbilili hot springs, Kalundu Mound, Isamu Pati and different traditional ceremonies. The cultural or heritage-associated ceremonies include Musamu Muyumu, Chuungu Manzi Abila (associated with the hot springs).

## The Farmers' Nest as the focus landscape

The exploration for a suitable landscape where the COLANDS initiative could be implemented began with a comparison and review of information (written and oral) on the biophysical and social elements of landscapes in North-Western and Southern provinces of Zambia. Notwithstanding similarities, the preliminary review of the two provinces pointed to the Southern Province, where four candidate districts were eventually considered and scrutinized further. These are Choma, Kazungula, Zimba and Kalomo Districts (Figure 9.2).

The search processes included a combination of stakeholder engagement and consultations in the form of workshops, meetings, and field visits conducted within and outside candidate landscapes[3] (districts). Such engagements spanned several social, economic and political factors found at district and village levels within the three districts, which determined the district and villages selected for the COLANDS Initiative. The factors that guided the choice of the district while bearing in mind the salient principles of landscape approaches upon which the COLANDS initiative is based are as follows:

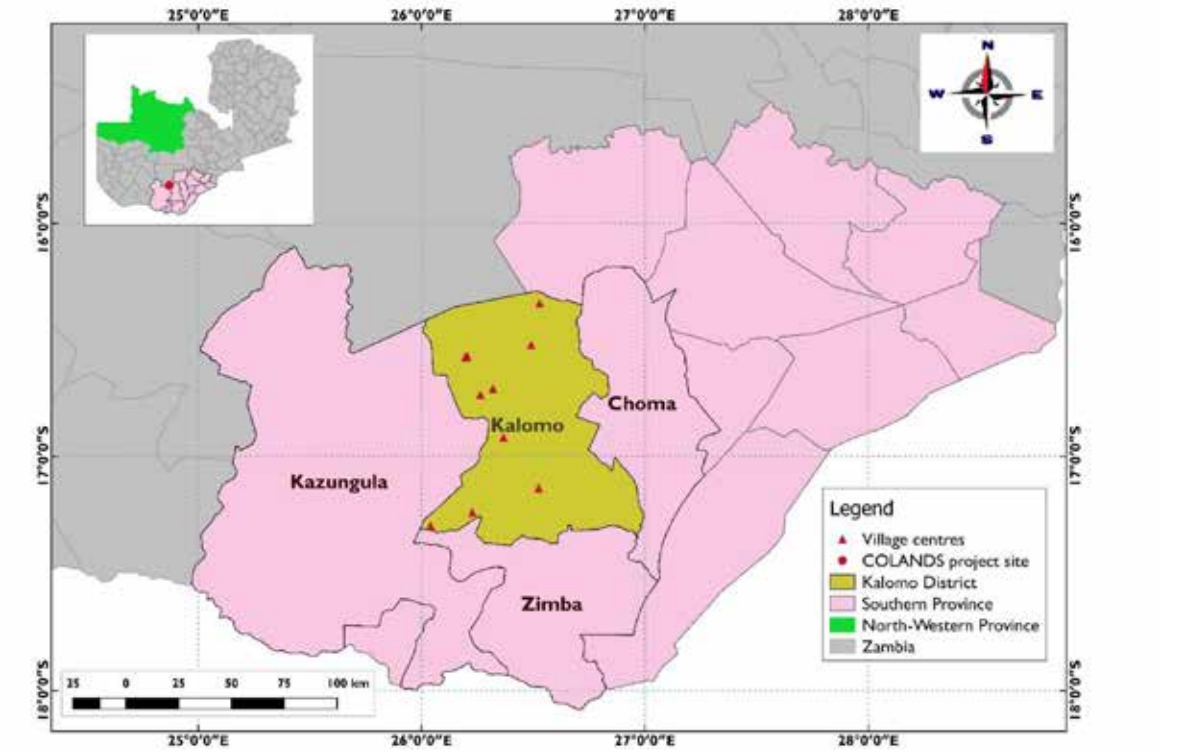


**Figure 9.2 Initial candidate districts for the COLANDS initiative.**

3 Inception Workshop (18-22 June 2018), CIFOR, Bogor Campus, Indonesia (for Kalomo District); Generative Interviews Training Programme (10-12 July 2019) for Village-Based Research Assistants, Zuus Lodge, Kalomo District (for nine study villages).

- *Landscape heterogeneity and dynamics*
  The social and biophysical diversity of a landscape is shaped by the history, migration and ethnic composition, and by physical and cultural attributes. The Kafue and Zambezi watersheds as well as Miombo and Mopane vegetation types dominate the biophysical components of the three candidate districts. The cultural land facets such as villages and shrines, which are some of the oldest symbols of political and social significance (Colson 1948) and landscape governance, characterize the areas. These landscape elements influence social practices, and, in some cases, they form the basis for an assortment of claims and counter claims by different livelihood sectors.
- *Multiple stakeholders and platforms*
  It is important for the study district to have a mix of state and non-state actors dealing with social, economic and biophysical elements of the landscape. The private sector entities should be involved in wildlife, game ranches, livestock and agro-input supply, value chains and markets. The traditional state actors on both state land (forest reserves, national parks, etc.) and customary land (game management areas (GMAs), sacred groves, etc.) should include active local governance of resources. This may be in the form of a district council working hand in hand with the district administration (in the ministry of Local Government), line ministries and traditional leaders (chiefs and village headmen and headwomen). Bridging institutions, such as non-governmental and research organizations can be added to give diversity and to offer complementarity to avenues for engagement at various governance levels.
- *History of engagement with landscape approaches*
  The district chosen ought to have a well-documented and oral history of the implementation of past and current policy interventions. Such district features would proffer useful lessons for the COLANDS initiative as a way of presenting landscape change or an evolution trajectory. Furthermore, it could present opportunities for the examination of the ten landscape principles as articulated by Sayer et al. (2013) and the associated theory-practice gaps.
- *Internal and external drivers of change*
  Current environmental, socioeconomic and institutional contexts drive landscape evolution and dynamics in Kalomo, Zimba, Kazungula and Choma. The drivers of landscape change in these districts are many and varied. The most prominent are population growth, agricultural expansion, declining land quality, widespread deforestation and climate change. It is difficult to separate one challenge from the other, especially since anthropogenic activities have heavily degraded protected areas (PAs) (e.g. forests reserves, GMAs and cultural shrines) and have reduced the availability of and access to safe water sources through the siltation of surface water bodies such as dams and rivers/streams. Currently, organizational and institutional coordination at district level is limited, and has been further worsened by limited extension and law enforcement services. Heritage resources and sites are not being maintained, let alone managed (Chinene 2006; Mbanga et al. 2019; Umar 2019; Moombe 2020[4]).

4 Discussions during the Twin Cave Theory of Change Workshop (16 February-20 February 2020) at Twin Cave Lodge organized by CIFOR confirmed that these landscape matters are still of concern (Moombe (2020).

- *Accessibility/security/logistics*
  All four candidate districts (for example, Kalomo) are accessible throughout the year despite the low coverage and poor condition of roads and transport networks (Tembo 2016), especially in rural areas. There have been no notable nor ongoing incidences of armed conflicts, either political or religious.
- *Expected constraints, enabling conditions and applicability for scaling up*
  The expected key constraint in executing the COLANDS initiative hinges on weak institutional coordination within and among the actors. Therefore, of immense value to the intervention would be a vibrant hub of commercial and subsistence agriculture practitioners that could offer significant levels of stakeholder interactions. Unfortunately, as with most district councils in Zambia, suitable platforms in the four candidate districts have not been identified, especially against a background of weak coordination. Thus, the current application of a suite of requisite institutional frameworks and guidelines (ROZ, 2002; GRZ, 2014; GRZ, 2015; GRZ, n.d.; URPA 2015; GRZ, 2016; GRZ, 2018) on decentralization, climate change, chiefs, urban and regional planning, REDD+[5], forestry (including community forestry) and those relating to wood fuel has not taken hold. There is a whole list of projects whose lessons could be included in the interrogation of the applicability of the landscape approach (LA) principles (Box 9.1) and these can be added to the first generation of social forestry programs of the late 1980s in the province or country. Integrating lessons from these and the COLANDS initiative could provide a robust framework for assessing scaling-up options.

The above considerations for suitability of the COLANDS initiative, especially the multiple stakeholders and platforms and the history of engagement with landscape approaches, favored Kalomo District. For example, some of the interventions such as soil conservation (Haggblade and Tembo 2003[6]), the improved farmers' programs of

**Box 9.1 Some key projects/initiatives (see also Chapter 3).**

For Zambia, critical programs with relevant hallmark experiences and lessons to be hybridized with the COLANDS initiative include: the Decentralized Forest and other Natural Resources Management Project (DFRNMP), Strengthening Management Effectiveness and Generating Multiple Environmental Benefits within and around the Greater Kafue National Park and West Lunga National Park (GEF V), the Promoting Climate Resilient Community Based Regeneration of Indigenous Forests in Zambia Project, and the Zambia Integrated Forest Landscape Project (ZIFLP).

5 Reducing Emissions from Deforestation and forest Degradation.

6 A Swedish-funded Soil Conservation and Fertility Enhancement (SCAFE) project began in 1985 to promote a wide range of erosion control measures such as bunding, contour tillage, and vetiver grasses; and soil fertility enhancement techniques. The latter included crop residue management, green manures, cover crops, mulching, improved fallows, and conservation tillage. It later changed its name to the Land Management and Conservation Farming (LMCF) project.

1936, Community-Based Natural Resource Management and Sustainable Agriculture (CONASA) (Manning 2011[7]) and SCRIKA[8] that have been implemented in Kalomo District are important in informing the COLANDS initiative.

### Selection criteria for study sites

In all the three chiefdoms in Kalomo District, consideration was given for the selection of villages for the COLANDS initiative research activities along what is perceived as the state-chiefdom power continuum, i.e. following a gradient from customary to state land (Kalomo Hills Local Forest Reserve No. P.13 or KFR). As for the district, a qualitative aggregation of the considerations or factors outlined here resulted in choosing 10 study villages[9] (see Appendix 9A: Selected characteristics of the selected villages). Three villages were selected in each of the Siachitema and Sipatunyana chiefdoms and four in Chikanta chiefdom: one around the chiefdom palace (perceived as the center of traditional power), another village somewhere in-between (buffer zone) the palace village and the KFR, and the third one in the KFR. The fourth village in Chikanta is in a cultural landscape in a sacred grove locally referred to as malende. The villages participating in the COLANDS initiative represent a demographic mix of cultural practices, powers and leadership capacities. This diversity is due to various social-biophysical historical backgrounds and development-induced displacements. Tracing the evolutionary dynamics from earlier landscape events could reveal valuable lessons for LAs.

## 9.2 Characterizing the "Land of Maize and Cattle"

### 9.2.1 Historical context of Kalomo

Kalomo town is a pre-Independence railway settlement with a strong colonial footprint, as its early development is associated with railway line construction that reached the present site in 1905 and was the first administrative capital for North-Western Rhodesia (NWR) from 1902 to 1907. Kalomo town was a subdistrict of Batoka District, established in 1900/1901. It was selected and opened in 1899 because of its pleasant weather (NAZ, KSB 3/1). Later, Livingstone proved to be a healthier location than Kalomo (whose

7 CONASA was funded by the United States Agency for International Development USAID and implemented in the district from early 2001 until 2005 by a consortium of organizations that included CARE, the Wildlife Conservation Society (WCS) and the African Wildlife Foundation (AWF). The aim of the project was to improve the livelihood security of people living within the project area, and to increase the sustainable production of natural resources (Manning 2011).

8 Strengthening Climate Resilience in the Kafue Subbasin project was funded by the World Bank and implemented from 2015 until 2019 using mostly a livelihoods and integrated conservation and development approach.

9 This took place during the Generative Interviews Training Programme (10-12 July 2019) for Village-Based Research Assistants, Zuus Lodge, Kalomo District (for nine study villages). The training focused on how to conduct a social survey on the multifunctional uses of the Kalomo, associated changes, institutions and visions about the landscapes.

residents suffered from malaria and fever attacks) for the settler government and so assumed the capital status of NWR in September 1907 (NAZ, KSP 3/1; Nchito 2010; Nchito 2013).

Before colonial rule, the primary land use in the Plateau Tonga (where Kalomo lies) was shifting cultivation using primarily hand tools. Once raids by the Lozi, Kololo and Ndebele peoples began (circa 1800), activities such as cropping and cattle production were dislocated and reduced (Dixon-Fyle 1976; Murphy 2003; Thomson and Bennet 2005). Under colonial rule, as with many of the countries of southern Africa, land was alienated from the indigenous Plateau Tonga for occupation by European settlers (Commonwealth Secretariat 1979; Anderson and Grove 1987) and these farmers competed with indigenous maize farmers. The change in African farming in the late 1920s, aided by the adoption and increasing use of the plough and draft oxen, and increasing crop yields and competition in the market caused such settlers to demand the imposition of marketing controls (Vickery 1985). The widespread use of the animal-drawn plow heralded the beginning of a new threat in the form of soil erosion and land degradation, especially in areas where soil and water conservation measures were disregarded (Beinart 1984). The plow spurred agricultural expansion into even fragile ecosystems such as stream banks and wetlands. This context created tension between African peoples and settler immigrants. In response, the government introduced agrarian and land-use policy measures (Table 9.1).

**Table 9.1 Prominent policies to manage the African-immigrant settler production systems**

| Year | Policy, actions, measures | Purpose |
|---|---|---|
| 1906 | Movement of local people from ancestral areas to less fertile ones | Accommodate the construction of the railway, and provide land for the settler immigrants producing maize and cattle for the Congo market |
| 1928 | Native Reserve Policy (NRP) | Make it easier for the immigrant farmers to produce for the market |
| 1935 | Maize Control Board (MCB) | Control to increase African production and protect the immigrant farmer from competition[a] |
| 1936 | Maize Control Policy (MCP), Land (soil) Conservation Extension Schemes | Protect settler farmers, control and rehabilitate deteriorating land (also applied to native farming lands) |
| 1945 | Land Usage Survey (LUS) | Introduce differential pricing to motivate farmers to practice conservation agriculture with bonuses to those who met satisfactory levels |
| 1946 | Improved Farming Scheme (IFS) | Check overcultivation among the Plateau Tonga |
| 1949 | Natural Resources Board (NRB) | Engage farmers in conservation schemes management through conservation committees |

Note:
a Maize Control Acts of 1935 to 1955.

Source: Dixon-Fyle (1976, 1977).

In addition to these measures, the colonial administration established schemes such as the Improved Farming Scheme (IFS) aimed at creating a new cadre of African farmers. This was regarded with suspicion because it developed a small group of farmers, who were seen as privileged. However, they also resisted the scheme because of the hard work needed to improve the plots and inadequate compensation. Most farmers did not see the need for contour ridges and grass strips on their lands, and hefty fines were imposed on those who failed to observe the rules (Dixon-Fyle 1977; Stocking 1985). To most people, the conservation measures became symbols of oppression and were one of the many reasons for contestation. In response to these policies, African farmers created farmer associations and resisted some of the policies, which became strong bedrocks for entities fighting for independence, such as the 1948 Northern Rhodesia African Congress (NRAC). The extent to which the optimum parts of such policies continued into the post-Independence period is unclear, but we note that riverine gardens have been opened and human-wildlife conflicts around water points have increased, while the destruction of the crops of people who have moved into the interior of the bush have intensified. Soil erosion and deforestation have continued unabated; aspects that may be beyond the power of local-level institutions such as village headmen and headwomen. Over time, the ChiTonga culture and practices were affected and eroded, as were the taboos that helped with conservation work such as rainmaking. The cutting and removal of spiritual trees such as *Parinari curatellifolia,* have opened up the natural resources to disrespect and loss (Thomson and Bennet 2005).

### 9.2.2 Biophysical context of Kalomo

#### Climate

Falling in agro-ecological zone II of the country's climate classification, the Plateau Tonga on which the Kalomo District sits, experiences cool and dry (May-August), hot and dry (September-November) and warm and wet (December-April) seasons (Dixon-Fyle 1976; GRZ 2004). Kalomo is one of the coolest districts in Zambia. The mean annual temperature is 20 °C. The temperature ranges from as low as 2 °C to as high as 40 °C in the warm wet season. The rainfall is highly variable, ranging between 800 and 1200 mm in the higher altitude areas and < 800 mm in some lower parts (GRZ 2004; Kalinda et al. 2010; Somanje et al. 2017; KTC 2018). The rainfall days and amounts from 2004 to 2010 show a general decline (Figure 9.3). The average amount is 616.7 mm (range: 141.2- 946.5 mm) over an average number of 50 rainfall days (range: 27-69 days). Previously, November-March/April was the main period for rains (Roberts 1976). However, dry periods over the period December-March/April is now commonplace.

The extent to which these climatic changes have affected livelihoods and food production has been severe, but the changes have not affected maize production in the district as the government and non-government organizations (NGOs) have stepped up agricultural input support.

#### Vegetation

Kalomo is covered by vegetation associated with dry forests and woodlands. The most prominent vegetation type is Miombo forest which is dominated by trees from the

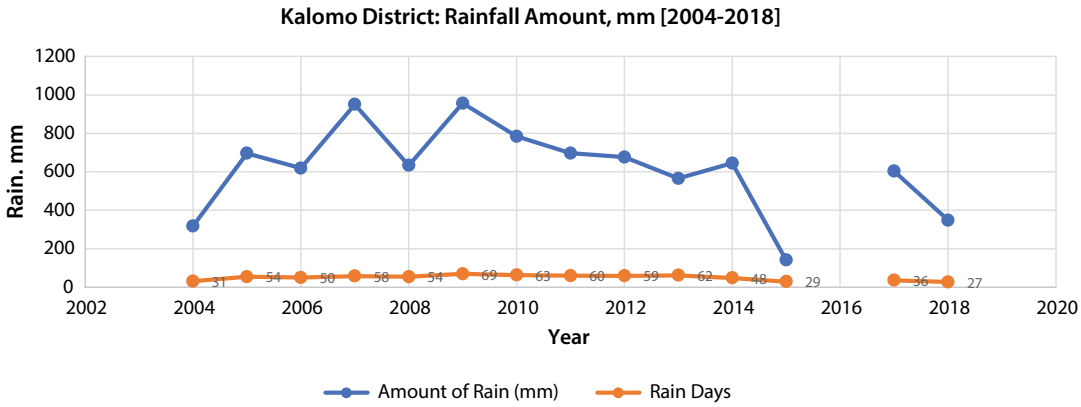


**Figure 9.3 Rainfall amounts in Kalomo District (15-year period).**
Source: Based on Kalomo Town Council data (KTC 2018)

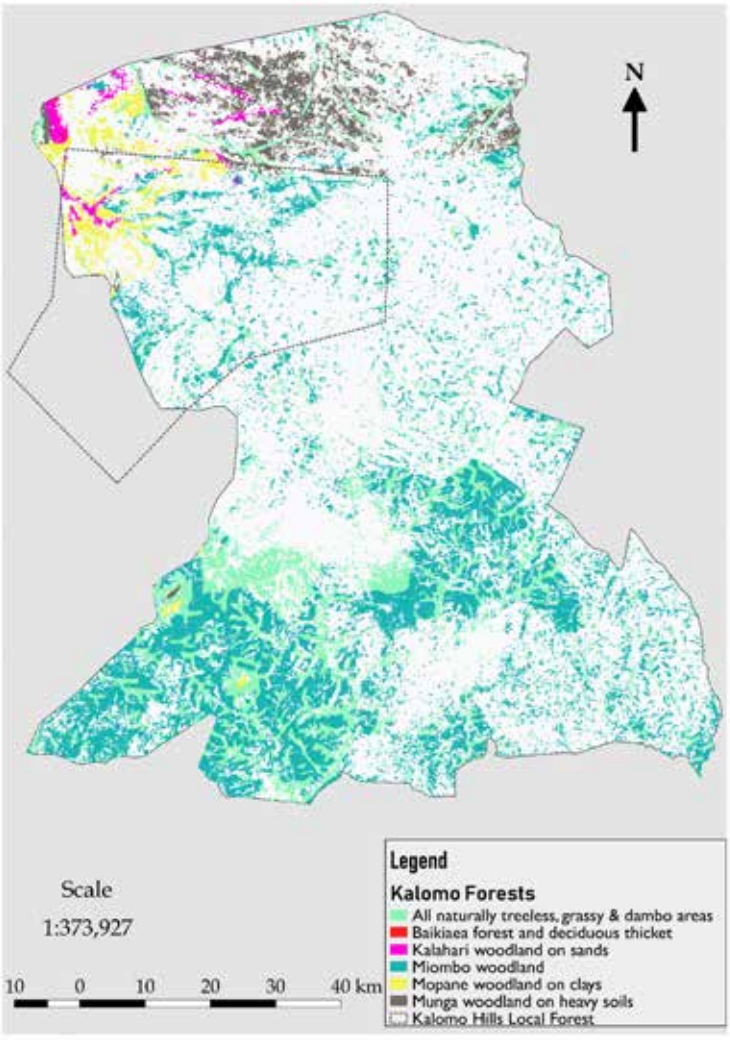


**Figure 9.4 Kalomo vegetation.**

genera *Brachystegia, Julbernardia, Isoberlinia* and other leguminous trees with a well-developed grass layer. The woodland has undergone significant transformation in the last three decades. Most Miombo forest is secondary regrowth because of extensive cultivation in the past. In the west, Miombo woodlands have invaded into the Kalahari, forming Miombo/Kalahari woodlands (Dixon-Fyle 1976; Forestry Department 1976; Roberts 1976; Bäumle et al. 2007; Mbanga et al. 2019).

### Topography, soils and hydrology

The district lies on a high plateau, referred to as the Batoka or Tonga[10] Plateau at an altitude of between 1220 and 1830 meters above sea level (Fagan 1963[11]; Roberts 1988), consisting of a soft undulating plain with a peak at its center. In terms of topography, Kalomo District can be divided into the plateau, the eastern escarpment, the southern Zambezi Basin and the Western Plains. In general, the district has sandy loam soils with scattered Kalahari sands and clay loam (ESDAC n.d.; Roberts 1976; KTC 2018) (Table 9.2).

The general drainage pattern in Kalomo District is toward the south to the Zambezi River. There are a few perennial rivers in the district. Kalomo River is the most noticeable (length of ca. 250 km) with a drainage catchment of 6636 km$^2$ which forms part of the Zambezi Basin. Other major rivers are the Sichikwenkwe, Mweemba, Kanyameza, Nanzhila and Luezi (Walsh 1950; Roberts 1976; Chinene 2006; KTC 2018). Although rarely used for water supply purposes because they are considered sacred places, groups of perennial hot springs, e.g. the Bbilili hot springs also exist (Bäumle et al. 2007).

**Table 9.2 Soil features of Kalomo topographical zones.**

| Part | Soil Features |
|---|---|
| Plateau | Sandvelt soils overlaying a complex granite batholith |
| Eastern escarpment | Ferric Luvisol with Orthic/Xanthic Ferrasol, moderately leached reddish to brownish clayey to loamy soils, derived from acid rocks on Miombo vegetation |
| Southern Zambezi Basin | Brown sandy loams which mix progressively with the Kalahari sands |
| Western Plains | Dystric Gleysol with Humic Gleysol, hydromorphic sand soils, very poorly drained in large dambos, nutritionally deficient grassy in carbonate-rich geology and poorly sorted sandy silts, seasonally waterlogged depressions |
| Northern parts | Low and flat areas making them susceptible to summer floods, some limestone-derived soils overlaying dolomitic limestone at the edge of the Kafue Basin |

Source: Bäumle et al. (2007); Chinene (2006); von der Heyden and New (2003); KTC (2018)

10 Linguistically, the term 'Tonga' has been used to describe a group within the Central Bantu Zone which includes the Tonga, Lenje, We, Ila, Totela and other groups (Dixon-Fyle 1976).

11 This is 4000 ft (1219.2 m) above sea level.

### 9.2.3 Socio-economic context

#### Demography

The population of the Southern Province has been on the increase with growth rates of 2.7% per annum between 2011 and 2013 due to, among other factors, improved access to health facilities, immigration and an increase in economic activities (CSO 2012). As of 2013, Kalomo District has a population of 395,471 which is projected to be 697,023 people by 2035 (CSO 2012). At present there are close to 44,728 households holding 258,570 people (female: 51.4%, male: 48.6%) at a density of 17.2 persons per $km^2$. Comparatively, in 1963, a year before Independence, the population was 75,884 people. The total human population in the nine villages in the area where the COLANDS initiative is being implemented is approximately 6707, ranging from 152 to 1785 people per village. The average number of households per village is 160.3 (CSO, 2012; Moombe and Gumbo 2019).

#### Migration and settlement patterns

Kalomo exhibits a mix of people, including early white farmer settlers and local livestock herders. Migration in the district dates to pre-colonial times. Ethnically, the early migrants were Batonga, a Bantu ethnic group of southern Zambia, neighboring northern Zimbabwe, and to a lesser extent, Mozambique. The Batonga people settled in the area in the early 17$^{th}$ century (Cliggett 2000). The history of the settlement patterns of the Tonga people of Kalomo is similar to the rest of Southern Province. They started as a society preyed on by powerful African neighbors such as the Lozi and Ndebele tribes who coveted their cattle during the mid-1800s. In response, they developed a highly dispersed pattern of settlement, which was easier to defend (Roberts 1976). At that time, the Tonga villages were a collection of huts spread over many kilometers and very few significantly large clusters developed. Tonga people also contended with early colonialism. The arrival of European foreign influence further disrupted the spatial organization of settlements on the Tonga Plateau, disturbing the indigenous economy and introducing urbanization (Nchito 2013).

There has been more recent migration in the Kalomo landscape. In a sample of nine villages, there is an average of 15 (range 3-54) migrants per village (Moombe and Gumbo 2019). For instance, Siankwembo, one of the oldest known villages in KFR, migrated from west of northern Rhodesia (Namwala areas) due to wars and, over time, were relegated to infertile land margins and eventually forced to settle in the forest reserve areas.[12] Similarly, people in Nkandazovu, one of the villages in KFR, migrated from the Gwembe area during the construction of the Kariba dam (1955-1959). This is referred to in the Zambian development literature as Gwembe-Tonga Development Project, a compensation scheme. This project was funded by the government and World Bank and is a typical example of a conservation-development conflict, as it legitimatized settlements in a protected area.

12 Verbal communication with village headwoman, 2020.

Generally, there are now more than 50 villages in KFR, compared with only five (i.e. Siankwembo, Siantambo, Sinyolo, Simapungula and Sande) in 1951 (Wadhams 1951). Currently, there are around 57,000 people, including about 12,000 farmers, accessing goods and services from the KFR. About 34,000 of these people reside in the reserve itself, compared with only about 300 adults from the five widely scattered villages at the time of its declaration (Wadhams 1951; ROZ, 1982; Mwansa 2018; Mbanga et al. 2019). Occupation in the KFR (both legal and illegal) is about 47.2-70% of the area.[13] Agriculture, especially the expansion of crop fields (77.5%), has contributed most significantly to forest degradation in the reserve. Fifty percent of the 220,000 (i.e. 111,000) tonnes of maize produced by Kalomo District comes from the KFR and its periphery. Settlements develop as a result of urban-rural migration and demand for services such as biomass energy, education, health facilities, communication, infrastructure and dams (Cooma 2018; Mwansa 2018). These activities have led to forest- cover change by 2% per annum from 1984 to 2018, which is equivalent to 2836 ha per annum. Consequently, shrubs and grassland have replaced forests in some places (Mbanga et al. 2019).

### 9.2.4 Landscape mosaics

#### Watershed and forest landscapes

Kalomo landscape is part of the Kafue and the Zambezi Basin river systems. The former is approximately 42% of the total land area. The latter system drains the remaining 58% of Kalomo (MIGA 2013). The Nanzhila sub catchment is the largest of the lower Kafue and is approximately 7134 $km^2$, with an estimated discharge of 308 $m^3/s$. All the other tributaries in the district are seasonal, transporting sporadic runoff during the rainy season (Bäumle et al. 2007; Chanda et al. 2019).

Dambos (shallow seasonal wetlands) account for 36.4% of total district land cover and serve as animal grazing and small-scale agriculture areas due to their ability to retain moisture during most of the dry season (Roberts 1988; Kadohira and Samui 2002). Croplands that include seasonal and abandoned fallow areas cover about 35.8% of the district land. The forest mosaics cover 23.2% (Forestry Department 2016), equivalent to 181,000 ha. The mosaics result from the widespread practice of farming and animal grazing. More than 50% of the forest area is under private tenure through commercial farms.

Bare ground is about 4.0% of total land cover in the district (which includes rural and urban settlements, infrastructure and agricultural lands). Water bodies (dam reservoirs, rivers, dambos and other water pools) constitute the smallest part of land cover in Kalomo (0.2%). Figures 9.5 A and B show the distribution of land cover, use and forest distribution.

Kalomo District has two forest reserves: Kalomo Hills Local Forest Reserve No. P.13 (KFR) and Zimba Hills Local Forest Reserve No. P.10 (ZFR). Administratively, Zimba Hills Local Forest has been left to be managed by Zimba District because of its proximity. It is not discussed further here.

13 Verbal communication with the Forestry Department, 2020.

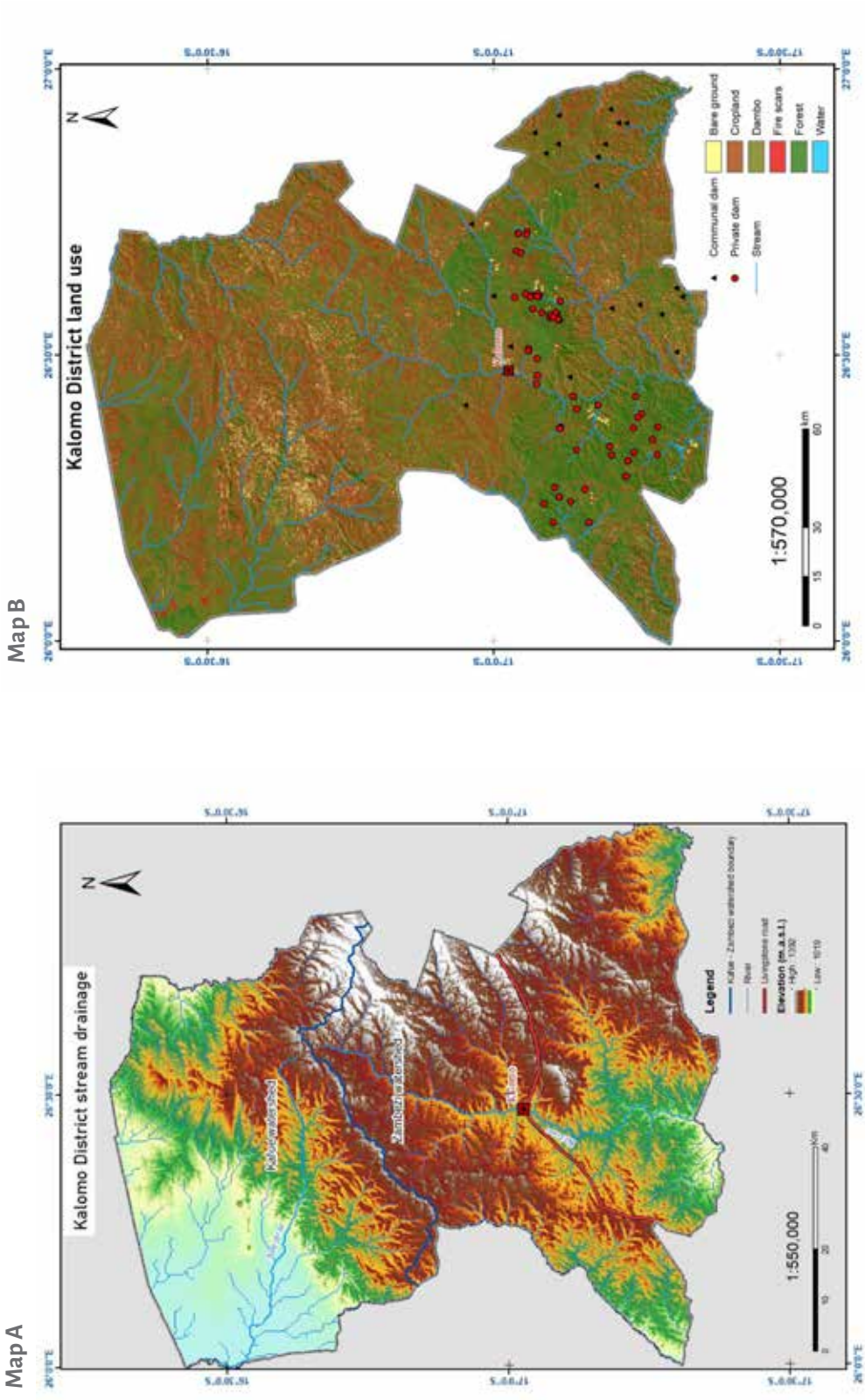


Figure 9.5 Kalomo land cover/land use (Map A) and distribution of forests (Map B)

**Table 9.3 Kalomo Hills Local Forest Reserve land cover**

| | Cropland | Dambo | Forest | Water | Bare ground | Total |
|---|---|---|---|---|---|---|
| Ha | 84,377.61 | 52,464.80 | 40,255.28 | 22.11 | 6,330.99 | 183,450.79 |
| % Cover | 45.99 | 28.60 | 21.94 | 0.01 | 3.45 | |

Source: Authors

**Table 9.4 Livestock distribution in Kalomo District**

| Livestock | % of Total |
|---|---|
| Poultry | 55.2 |
| Cattle | 27.6 |
| Goats | 13.8 |
| Sheep | 1.9 |
| Pigs | 1.3 |
| Donkeys | 0.2 |
| Total | 100.0 |

Source: KTC (2018)

Kalomo Hills Local Forest Reserve No. P.13 (KFR), declared as such in 1952, is one of the state reserves in Kalomo. Since its declaration, its boundary has been altered legally three times, in 1970, 1975 and 1987. The reserve is partly in theChikanta and partly in the Siachitema chiefdoms in Dundumwezi Constituency, covering Bbilili, Naluja, Omba and Kasukwe Wards.

Its land cover and vegetation are like those in the rest of the district but differently configured (Table 9.3). Riparian, Miombo, Mopane and Kalahari woodlands/forests compose and predominate vegetation in the reserve. Munga and Savanna woodlands also occur in patches.

The reserve is a water and soil conservation area, being a headwater of significant rivers in the district (Wadhams 1951[14]). As of 2020, the reserve covers approximately 162,200 ha and encroachments are on-going.

### Agricultural landscapes: Livelihoods and land use pressure

Kalomo is referred to as the 'Farmer's Nest' because of the commercial, medium- to small-scale livestock and crop farming enterprises that exist there. Sales of crops, livestock and fisheries products, as well as fruits and vegetables, contribute about 50% of local household incomes, with contributions of 34.4%, 9% and 7.8% from crops, livestock and fisheries, and fruits and vegetables, respectively. Alternative incomes include

14 Wadhams (1951) Reservation proposal No. S-4 Kalomo Hills to form the KPFA. Minute No. 829/R/12 by the Provincial Forestry Officer, Southern Province, Livingstone to the Chief Conservator of Forests, Ndola.

the collection of natural products (wild fruits, mushrooms and honey) and the sale of fuelwood, charcoal and handicrafts (Kalinda et al. 2010).

Livestock production consists of traditional (indigenous) (50%) and commercial (50%) methods, with a total population of 411,765 animals. This population gives a cattle/capita of 0.44. Besides cattle, people rear goats, sheep, poultry and pigs too (KTC 2018). Table 9.4 shows that poultry leads in number.

In the nine villages within the project working area, an average of 730 cattle per village were noted. These stock numbers create grazing conflicts in some villages, such as Mubombo Ulilanyama, which has local bylaws that restrict the number of cattle per household. It is not clear how much the range has improved due to these new arrangements. The poultry numbers range from 102 to 2801 per village, with an average of 1760. The average number of chickens is 906 per village (Moombe and Gumbo 2019; pers. comm. with headmen during Validation Workshop 2029) for the nine villages within this study.

Kalomo produces approximately 14 tonnes of fish per year and aquaculture is expanding in the district. As of 2020, there were 102 fish farmers, owning at least 174 fishponds (Fisheries Department[15]) with a total water surface area of 5820 $m^2$. The expansion and contribution to food and nutrition security could be attributed to an enabling policy environment and the provision of inputs (KTC 2018).

Crop production in the district is carried out at subsistence level, complemented by limited semi-commercial and commercial farming. Major crops grown are maize (*Zea mays*), groundnuts (*Arachis hypogeae*), cotton (*Gossypium hirsutum*), tobacco (*Nicotiana tabacum*), sunflowers (*Helianthus annuus*), cowpeas (*Vigna unguiculata)*, sweet potatoes (*Ipomoea batatas*), wheat (*Triticum aestivum)*, soybeans (*Glycine max*) and various vegetables (Kalinda et al. 2010; KTC 2018). Maize is the primary staple crop and occupies 61% of the cultivated area. Both landraces and hybrid maize varieties are cultivated. The distribution of land area among crops in the district is indigenous maize varieties (25%), groundnuts (26%) and hybrid maize (30%). Due to climate change, erratic rainfall and issues pertaining to the procurement of inputs, a general decline in maize production has been noted in the district from 2009 to 2018. The average cropped area is about 3 ha per household. Figure 9.6 shows the general decline in maize production quantity in the district from 2009 to 2018.

Gender plays a critical role in food production in the Kalomo landscape. In general, 1 ha of land supports on average two individuals, with female-headed households having smaller farm sizes of 3-5 ha of land. About 66% of men have access to land that is more than 5 ha (Kalinda et al. 2010). This social order has implications for the implementation of LAs in terms of participation and decision-making.

15 Kalomo Fish Farmers Information (Accessed in March 2020).

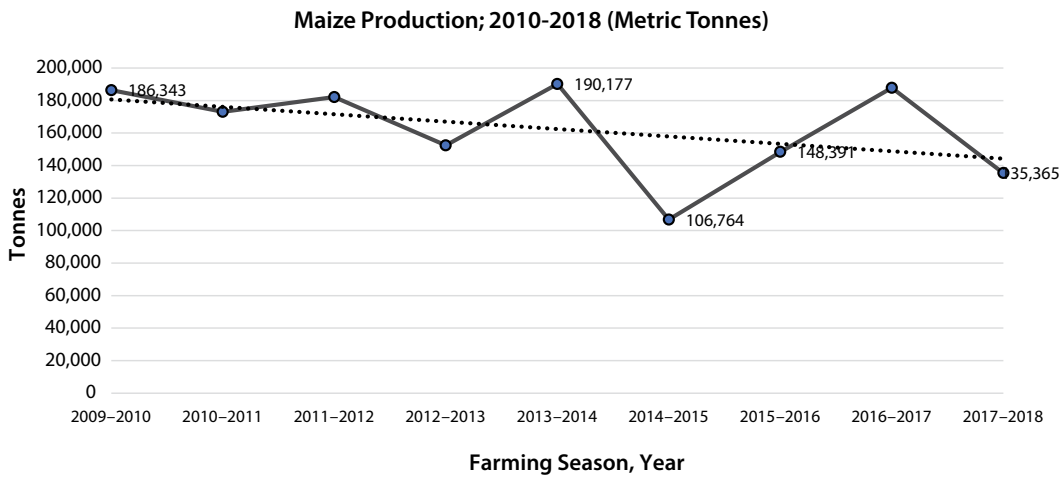


**Figure 9.6 Maize production in Kalomo District in metric tonnes (2010-2018).**
Source: Based on KTC (2018)

## Infrastructure development

Physical capital includes the basic infrastructure and producer goods needed to support livelihoods. Among the essentials for sustainable livelihoods are: affordable transport; secure shelter and buildings; adequate water supply and sanitation; clean, affordable energy; and access to information and means of communication). For Kalomo, the common and valuable physical assets comprise bicycles (73.3%), radios (67.1%), cattle (63%) and farming tools. For housing or dwellings, the predominant type (73%) is a brick house with grass thatched roof (Kalinda et al. 2010). There has been a gradual movement away from pole and thatch, which may signal an increased cutting down of trees for brick burning, which is contributing to tree loss.

Water is a scarce commodity in the Kalomo District, but with 178 dams, and an estimated average of 201,689 $m^3$ dam capacity at full supply level (Water Resources Department, Kalomo, 2012 [16]), some attempts to address the issue are in place. For example, between 1950 and 2019, an average of two dams were constructed every year. Available data[17] shows that 112 are privately owned, 55 are communal and one is owned by a church.[18] The construction of the dams was funded by entities comprising private (121), government (45), NGOs (6) and community (3). Three dams are in Chikanta, 137 in Sipatunyana and 38 in Siachitema chiefdom. The water in the dam reservoirs is used for animal watering, fish farming, irrigation and township supply.

Further infrastructure in the district comprises the railway and all-weather urban and rural roads that connect the district to the regional transportation networks; the

16 Based on data for 143 (of the 180) dams. Source: Excel sheet of Kalomo dams, and ward statistics was obtained from the Water Resources Department, Kalomo. Dated 2012.

17 Data are missing for nine dams.

18 Data on classification for the other dams is not available.

electricity grid (Zambia Electricity Supply Corporation, Rural Electrification Authority) including in the Dimbwe, Kalomo Rural Resettlement and Chikanta areas; state and private mobile, internet, television and radio telecommunication networks and services; and solar, biogas fuel and efficient energy-saving stoves. Although inadequate, this infrastructure is essential for economic and social development. For example, more investment is needed in alternative energy sources to reduce the use of wood fuel (KTC 2018). The telecommunications industry has improved information dissemination to the population in the district (KTC 2018), and could be valuable for COLANDS's engagement and outreach activities. Infrastructure development could also provide thematic and spatial areas for entry into piloting LA through dialogue, as these are centers of social struggles. Energy consumption places considerable pressure on the environment, e.g. wood fuel and charcoal demand contributes directly to forest degradation (KTC 2018).

## 9.3 Governance system at national, district and lower levels

### 9.3.1 State governance system

Zambia is pursuing a decentralized governance system that devolves decision-making responsibilities to district and subdistrict governance organs. Statutory and customary components are the two overlapping decision-making organs in Kalomo District, which the Constitution and other relevant legislations support. The statutory system consists of the political and administrative systems through formal government institutions administered by entities at national and district levels. The customary

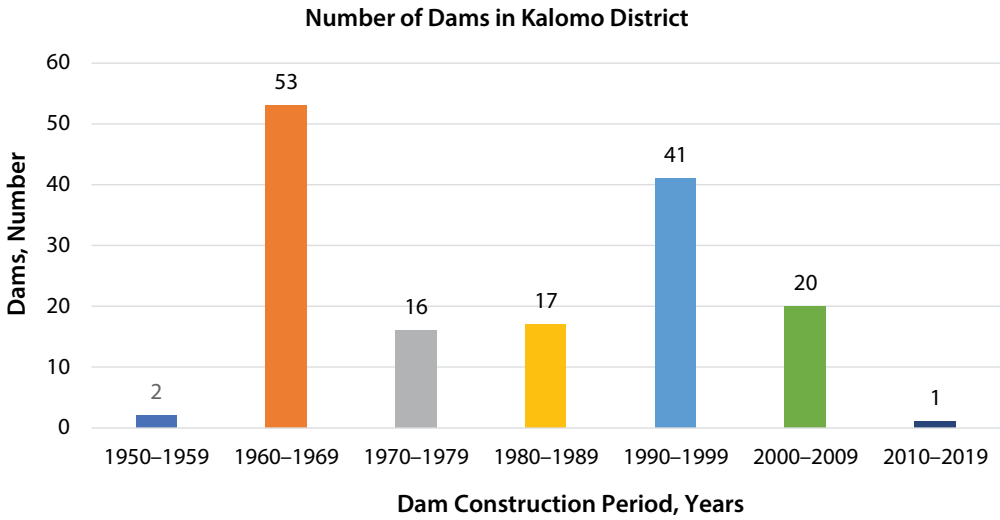


**Figure 9.7 Dam distribution by the period of construction.**

Source: based on data for the Department of Water Resource management Managem District (see Chapter 7); Kalomo_Dams_Kalomo District Wards_Water_Statistics_08 February 2012

governance systems exist at subdistrict level, i.e. chiefdom level. The customary system involves interpretations of bylaws, indigenous local rules and regulations. Both statutory and customary components of governance have often demonstrated overlaps in the responsibilities in the management of natural resources and decision-making. The overlapping jurisdictional responsibilities of these components of governance have implications for the implementation of integrated landscape approaches (ILAs) in Kalomo.

Members of Parliament (MPs) represent political-spatial constituencies at the national level in legal and policy formulations in the National Assembly. At the sub-district level, elected councillors who link with the MP represent the local communities in lobbying development programs. Councillors are key persons in the governance chain as they are linked to all centers of decision-making, such as village development committees and district council chambers. Ideally, councillors are members of the more politicized Community Development Fund (CDF) committee, a platform that decides on the allocation of resources to local-level development initiatives. In 2019, Kalomo had 18 wards councillors and three chiefs. The former do not attend any District Development Coordinating Committee (DDCC) meetings, but only the CDF committee and council meetings.

The administrative functions of the district are superintended by the District Administration (DA) office. The DA's office coordinates all activities of government departments, planning units and other line ministries through the DDCC. It is mandatory for NGOs, as members of the cluster sub-committees of the DDCC, to report to the DDCC on activities in which they are involved. In the recent restructured DDCC, chiefs are members of these district platforms and represent the interests of the chief's councils and Village Development Committees (VDCs). One of the chiefs, with the support of the Chiefs and Traditional Affairs Officer, represents the chiefs in the DDCC. These two sub-governance systems (political and statutory) are linked through procedures outlined in government functions.

### 9.3.2 Customary governance system

The Chiefs Act (GRZ, 1965) and Registration and Development of Villages Act (GRZ, 1971) provide for the engagement of customary institutions in the country's governance systems The Chiefs Act makes provision for the recognition, appointment and functions of chiefs by the President on condition that the person is entitled to hold the office under customary law. Tonga communities found in the three chiefdoms in the COLANDS area are matrilineal, where inheritance follows the female lineage of the previous chief's clan. Thus, through an inheritance system, chiefs are selected to rule for a lifetime unless there are certain extenuating circumstances. Customary land is controlled by the chiefs and their headmen, but act with the consent of their people (van Loenen 1999). Customary communities are organized based on villages in a chiefdom and under the jurisdiction of chiefs, e.g. Siachitema, Sipatunyana and Chikanta for Kalomo in the case of the working areas of COLANDS. In the royal lineage governance structure and system, the Chiefs' Royal Establishment or Governance Councils, Development Trust, and several committees (Executive, Land, Traditional, Zonal) at various levels support the

**Table 9.5 Chiefdom hierarchical governance structure and key functions: The case of Kalomo District.**

| Level | Chiefdom | | | | |
|---|---|---|---|---|---|
| | Sipatunyana | Siachitema | | Chikanta | |
| 1 | HRH Chief Sipatunyana | HRH Senior Chief Siachitema | | HRH Chief Chikanta (+ The Chikanta Royal Governance Council, CRGC) | |
| 2 | Royal Establishment Council (RECO) | Executive Committee (Royal Council) | | Chikanta Royal Governance Council (CRGC) | |
| 3 | Lands Committee | | | | Chikanta Development Trust (CDT) (registered with Registrar of Societies) |
| 4 | Senior Headmen and Chairpersons of Settlements | Senior Headmen | | Senior Headmen (Zonal Level) | |
| 5 | Headmen | Headmen | | Village Headperson | |
| 6 | | Chitumbi Traditional Court | (Maanzi Abila Traditional Committee) | Zone Committee (23 Zones) | |
| 6 | Village Committees | Village Committees | | Village Committee | |
| 7 | Subjects | Subjects | | Subjects | |
| | **Roles, Responsibilities** | | | | |
| | The Royal Establishment: Chooses a chief, provides counsel, resolves disputes, composed of 3 people.<br><br>The Lands Committee: Responsible for allocating land in settlements and verifying vacant plots, composed of 10 members, there are 12 chairpersons (not village head persons); in the settlements, there are 130 headmen. | The Executive Committee: Chooses a chief, provides counsel to his royal highness, composed of 11 persons (10 are head persons).<br><br>Chitumbi Traditional Court: Resolves disputes, composed of 10 persons (of whom 9 are headmen).<br><br>Maanzi Abila Committee: Organizes the Maanzi Abila Traditional Ceremony, composed of 12 members. The chiefdom has 215 village (27 are senior) headmen. | | CRGC: Chooses, provides counsel and makes recommendations to the chief. Examines policies/proposals; 25 members in this committee (21 headmen, 4 village committee members).<br>CDT: Oversees development activities and programs, managed by a 10-person committee, all villages have village committees that work with and assist the headman. Chiefdom has 330 villages and head persons (of which 30 are senior headmen). | |

Source: Moombe (2019); CCDSP 2012–2016

chiefs (Table 9.5). Trusts serve as links with the external partners such as government, NGOs and others. Chiefdoms are subdivided into zones that are led by senior headmen[19] in charge of several other headmen. Each village headman is supported by an elected village committee that also functions as a local-level platform for decision-making. In some villages, the Council of Elders supports the village headmen and traditional courts that help in resolving conflicts.

Chiefs provide overall leadership for the chiefdom and discharge the traditional functions of their office under customary law but within the confines of the Constitution or any written law. Every chief is required to preserve the public peace in his/her area (GRZ 1965). Besides, a chief ensures that all headmen duly perform their duties in his/her chiefdom. Chiefs also ensure that the village productivity committees (VPCs) are established and are functioning effectively, and that they report to the VPCs and ward development committees (WDCs) the decisions reached in the House of Chiefs affecting or concerning their people. Generally, each VPC is to do all such things as may be necessary or desirable for the establishment, promotion and development of facilities for the betterment and happiness of the villagers socially, culturally, economically and politically and to create awareness among the villagers toward those ends. Since 1964, the role and authority of the traditional institutions have been gradually diluted, although these institutions continue to have a significant role in resource mobilization for development (KTC 2018).

Although all headmen in Kalomo District appear to have equal power and responsibilities, the reality is different. Those selected based on clans and who have been in the area much longer, wield more influence and enjoy more privileges of choice of better and more productive land for settlement, agriculture and grazing than those not based on clans. The clan-based headmen may have some connections with the traditional royal clans or 'ruling class' and are very influential. 'Governance convenience,' where the chief aims to improve management efficiency at the local level and reduce the size of villages, is the basis for the selection of the non-clan headmen. Observations in the study area indicate that most headmen who have settled in marginal areas and forest reserves are either 'immigrants' or are not directly related to the 'traditional ruling class'. These headmen may be selected regardless of the origin of an individual vying for leadership. In all cases, the headmen's tenure is similar to that of the chief where one can serve for a lifetime unless the Council of Elders, the chief or the general village members wish to remove such a headman for gross misconduct. Village committees are elected every year or after two years, depending on the village, and may be re-elected for several terms.

### 9.3.3 Entry point for landscape governance and preliminary stakeholder analysis

The preliminary stakeholder analysis for the Kalomo District reveals key institutions in the governance of the landscape. The existing executive, legislative, and judiciary government framework and structures serve as the entry points for landscape

19 Headman is a traditional and legal title for the person in charge of a village – either male or female.

**Box 9.2 Organizations represented in the implementation of the COLANDS initiative in Kalomo District**

1) The executive (e.g. DC Office, Forestry, Agriculture, Water, Social Welfare, the Office of the President, Fisheries, Chiefs and Traditional Affairs, Agriculture Information Services, District Council, Chiefs and Headmen. In partnership with NGOs such as World Vision International, Care International, Community Based Natural Resources Management Forum (CBNRMF), Community Resources Boards (CRB) Association); 2) the legislature (e.g. National Assembly Office in Kalomo is a member of the COLANDS Consultative Working Group, chiefs/headmen); and 3) the judiciary (chiefs and headmen through the local courts).

governance under the COLANDS initiative. The coordination and actual implementation include the public and private sectors, NGOs as well as customary/rural community organizations and institutions across sectors of development. For example, participation in the COLANDS initiative so far has included organizations representing the entities listed in Box 9.2.

The government structures have served as entry channels with the advantage that they form part of the broader governance scheme (outlined in the Seventh National Development Plan (2017-2021) (7NDP). However, modifications to suit project aims may be needed. For example, the consultative working group serves to review, validate and provide information to the COLANDS initiative. This multidisciplinary group draws wisdom from the formal government structures.

## 9.4 Challenges, opportunities and options for landscape approach implementation

Several challenges in implementing a landscape approach exist as tabulated in Table 9.6. The major themes are sector-based priorities, actions and engagement models, policy incoherence, isolation of the private sector in natural resources management programs, cultural barriers and contestation over rights to resources.

### 9.4.1 Legal framework for LA

Over the years, the government has shown its commitment to a landscape approach through the development of several land use policy adjustments as well as in its 7NDP (Central Statistical Office (CSO) n.d.; see also Chapter 7).

### 9.4.2 Reflections from field events

The various stakeholder perspectives captured during field events help reflect ideas on landscapes, especially the centrality of biological diversity and ecosystem integrity, the value of ILAs in Kalomo, sharing roles, change detection and associated impacts as

**Table 9.6 Key challenges to the implementation of landscape approaches in Kalomo.**

| Institutional category | Land tenure category | | |
|---|---|---|---|
| | State | Customary | Private |
| Policy | Weak and segmented linkages and capacity, coordination, networking, and consultations among stakeholders and interest groups (state, customary, private) | | |
| | Enabling policies in one at the expense of another sector. Sector-based planning and management of natural resources, differences in extension models and mandates, institution-based interpretation of roles; mismatch between local-level aspirations and provisions of projects support | 'Preliminary' issues (e.g. boundary conflicts) that may need to be addressed before implementation | |
| Legislation | Incoherence in policy guidance in some cases (refer to 7.4.2); weak recognition of customary land tenure system | Absence of structures provided by the law to manage landscapes (VPC, WDCs) | |
| Technical | Inward-looking or internal capacity development that creates conflicts of interest | | |
| Governance | Land tenure recognition and public provision of land information; inadequate monitoring of landscapes | Contested role of traditional authorities in tenure systems | |
| | Inconsistent management of conflicts in the realm of conservation versus development (e.g. KFR) | | |
| Environmental | Culture of illegal access to resources | | A lack of private sector involvement in natural resources management initiatives |
| Social, cultural, economic | Low budgetary allocation | Cultural barriers to adoption of technologies (e.g. conservation agriculture); conflicts between Western (Christian) and traditional religious and other belief systems and values | |
| | Limited financial capacity of the actors (state, customary, private), differences in priorities and conceptualization of threats, contestations over a bundle of powers over resources | | |

Source: Chilesjhe (2005); Kalinda et al. (2010); Vinya et al. (2011); Mulolwa et al. (2016); Gumbo and Moombe (2018); Mbanga (2019); Umar (2019); Moombe and Gumbo (2020); pers. obs. Freddie Siangulube

well as how to factor these into project management and landscape governance. The stakeholders saw ILAs as a pathway to addressing land-use issues (conflict resolution) in the district. Clarification of stakeholder roles calls for facilitating empowerment and knowledge sharing, making it an all-encompassing consultative facility. The heterogeneity of landscapes result in spatial and temporal overlaps, which is based on a history of access and utilization. This calls for critical matching and valorization of the social and biophysical elements. A critical question in this respect is: What are the landscapes of Kalomo, and what are their values and capabilities? Government departments (including MPs, councillors and other leaders) work together to integrate knowledge systems, management approaches and context and to implement ILA within existing planning and coordination frameworks in the district. There could be issues of resistance to change, power and mandates, and recognition of chiefs. How far do these issues affect willingness and attitudes toward collaboration and cooperation? There is a need to consider the farmer-technocrat, technocrat-technocrat, technocrat-chief and chief-chief interfaces.

### 9.4.3 Methods to engage stakeholders in dialogue processes to envision future landscape trajectories

The organizing principle must be triangulation/validation through the application of multiple methods. The value of mixed methods and methodologies for landscape approaches may be in revealing historical trend analysis, scenario building/forecasting and theory of change (see Chapter 6). A cocktail of established methodologies can be applied here, for example in the multi-stakeholder platforms. Such a mix of methods helps us to understand better how the landscapes have evolved, how different actors or actor groups envision the landscape in the future, as well as how actors think they can get from the baseline situation to the desired future.

### 9.4.4 Further action: outreach, project implementation and research

Among the key actions could be:

- creating more buy-in or socializing the COLANDS initiative (themes, baseline information, sharing/feedback), and social network analyses;
- developing governance systems and processes (i.e. methods, tools, platforms, performance evaluation);
- undertaking research in landscape evolution (including analysis of past policy interventions that have shaped the landscapes), restoration (charcoal or sustainable feedstock supply), governance, local or indigenous adaptive knowledge stock take, co-production and application (access analysis and LA framework for assessing contestation in Kalomo);
- contributing to filling in research-policy-society gaps.

## Conclusion

The Farmers' Nest, i.e. Kalomo District, is under siege from long-term changes in weather, accelerating forest loss and unplanned settlements and villages as well as

declining soil fertility. Grazing is becoming increasingly scarce suggesting that there may be conflicts around cattle and grazing land and the institutions that manage them. Kalomo District represents fertile ground for exploring ILA approaches in the near future.

The district has its own share of history of land use and change – biophysical and social – which has not only shaped the landscape but also may explain the present state of the land. There is an underlying history of struggles and accommodation against a background of powerful chiefs and other institutions, but a rapidly deteriorating state of the land. While the traditional land management systems have remained largely intact, their capacity to address the new challenges of the land can be questioned, as evidenced by the loss of sacred lands to other land uses. The situation has been exacerbated by weak district coordination, which has allowed institutions to work in an unimpressive isolation mode – a perfect recipe for failure in resource management. With the challenges of charcoal production, limited grazing land and more demand for land on which to grow crops to fulfil the "maize and livestock" idiom, the reality is of great concern. But then, we wonder if these concerns are shared. ILAs offer an opportunity for dialogue and for the development of consensus and a shared way forward.

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## Appendix 9A Selected characteristics of the selected villages

| | Sipatunyana Chiefdom (130 villages) | | | Chikanta Chiefdom (330 villages) | | | Siachitema Chiefdom (215 villages) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Village | Siabalumbi | Mantanyani | Sianyama | Habulile (Nachibatula) | Mubombo | Simbayi | Siankwembo | Munakaasha | Mwindilila | Mudenda |
| Year of establishment | 1993 | 1894 | 1936 | 1996 | 1995 | 1938 | 1958 | 1980 | 1981 | 1983 |
| Size of village | 1800 ha (8 km²) | 5728 ha (57 km²) | | 4475 ha (45 km²) | 140 ha (1 km2) | (20 km²) | 905 ha (9 km²) | | 3867 ha (39 km²) | 2000 ha |
| Human population | 99 households, 1049 inhabitants (124 M, 247 F, 678 children) | 330 households, 1224 inhabitants (278 M, 549 F, 397 children) | 848 | 65 households, 400 inhabitants | 192 inhabitants (27 M, 32 F, 133 children) | 72 households, 468 inhabitants (57 M, 70 F, 34 children) | 27 households 201 inhabitants | 200 households, 1985 inhabitants (327 M, 829 F, 629 children) | 144 households, 960 inhabitants (201 M, 369 F, 380 children) | 160 Inhabitants (27 M, 36 F, 89 children) |
| Livestock population | 2077 (587 animals, 1490 birds) | 10,150 (6101 animals, 4049 birds) | 2909 (1507 animals, 1402 birds) | 1303 (573 animals, 730 birds) | 453 (241 animals, 212 birds) | 1529 (935 animals, 594 birds) | | 11,838 (6,151 animals, 5, 687 birds) | 2,780 (1,467 animals, 1,313 birds) | 600 (195 animals, 405 birds) |