Kingdom of Lesotho

Bureau of Statistics

Statistical Report
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2020 Environment Report

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CHAPTER 1: WATER AND SANITATION

1.0 Introduction

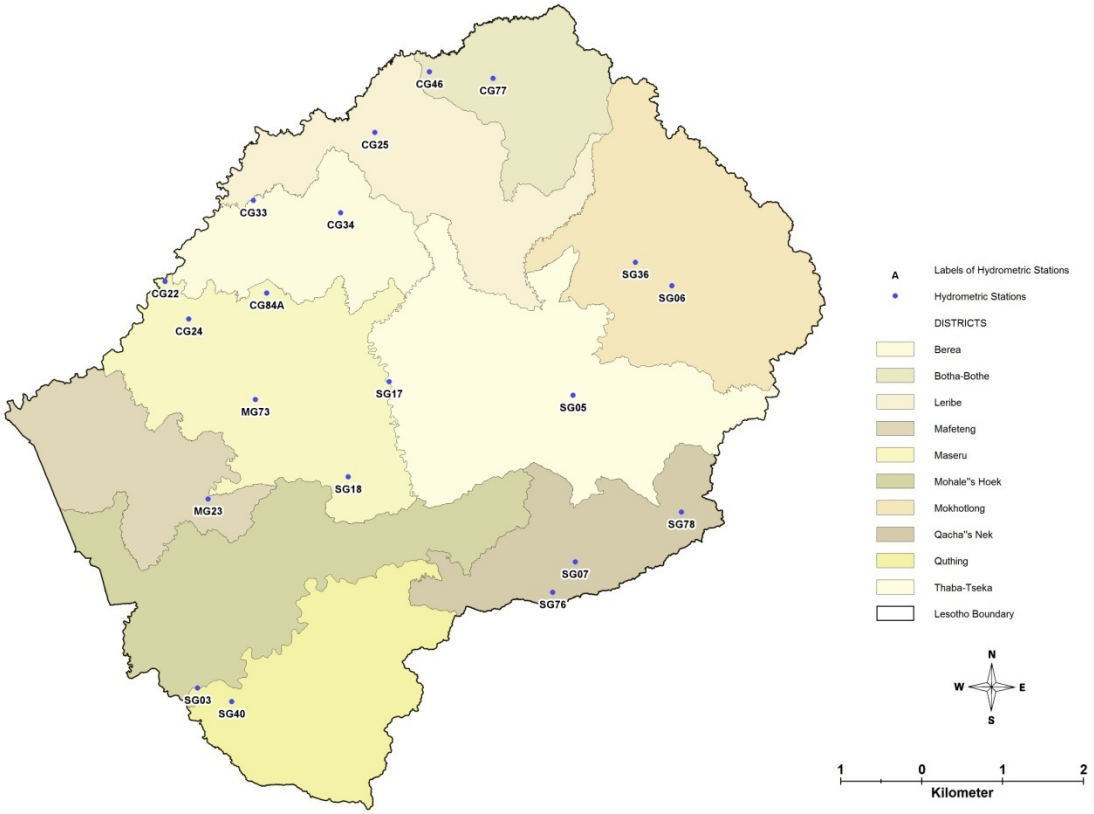
Water management and preservation is paramount in Lesotho. Water is a commodity that brings significant revenue in the country. Fish farming has directly benefited from proper water conservation practices. To monitor the flow of water in rivers, the Department of Water Affairs has built 20 hydrometric stations across the country. A hydrometric station is a data collection tool on a river, lake, estuary, or reservoir where water quality data (and other parameters) is collected and recorded (www.obwb.ca/hydrometrics/, 8/03/2022).

Table 1.1: List of names and codes of Hydrometric Stations in Lesotho

Station Name	River name	Location	Elevation (meters)
CG22	Mohokare	Maseru	1500
CG24	S. Phuthitsana	Masianokeng	1525
CG25	Hlotse	Ha Setene	1575
CG33	N. Phuthiatsana	Kolonyama	1525
CG34	N. Phuthiatsana	Mapoteng	1575
CG46	Moroeoroe	Botha-Bothe	1675
CG77	Nqoe	Muela	1705
CG84A	S. Phuthitsana	Metolong Upstream	1643
MG23	Makhaleng	Ha Qaba	1525
MG73	Makhalaneng	Makhalaneng bridge	1775
SG03	Senqu	Seaka Bridge	1425
SG05	Senqu	Koma-koma	1775
SG06	Senqu	Mokhotlong	2000
SG07	Tsoelike	Tsoelike bridge	1725
SG17	Senqunyane	Marakabei	1825
SG18	Maletsoinyane	Semonkong	2225
SG36	Kubelu	Tlokoeng	1575
SG40	Qomoqomomg	Quthing	1475
SG76	Sejabatho	Ha Manteko	1775
SG78	Leqooa	Leqooa Bridge	2200

Source: Department of Water Affairs

The codes reflected in the map represents the names of Hydrometric stations



Sanitation is important for human health, dignity and development. The characteristics of good sanitation include properly built and well-ventilated pit latrine structures, and protected wells. The correct disposal of human and animal waste ensures that the contamination of water is significantly reduced. Proper human development is directly influenced by good sanitation and hygiene. Hence the risk of water borne diseases is greatly reduced by both good sanitation and hygiene. Through its yearly projects, Rural Water Supply carries out sanitation improvement projects.

1.1 Scope and coverage

Information relating to water from 2016 to 2020 has been collected from government Ministries, Departments and Agencies (MDAs). Water data pertaining to urban water quality was obtained from the Water and Sewerage Company (WASCO).

1.2 Results

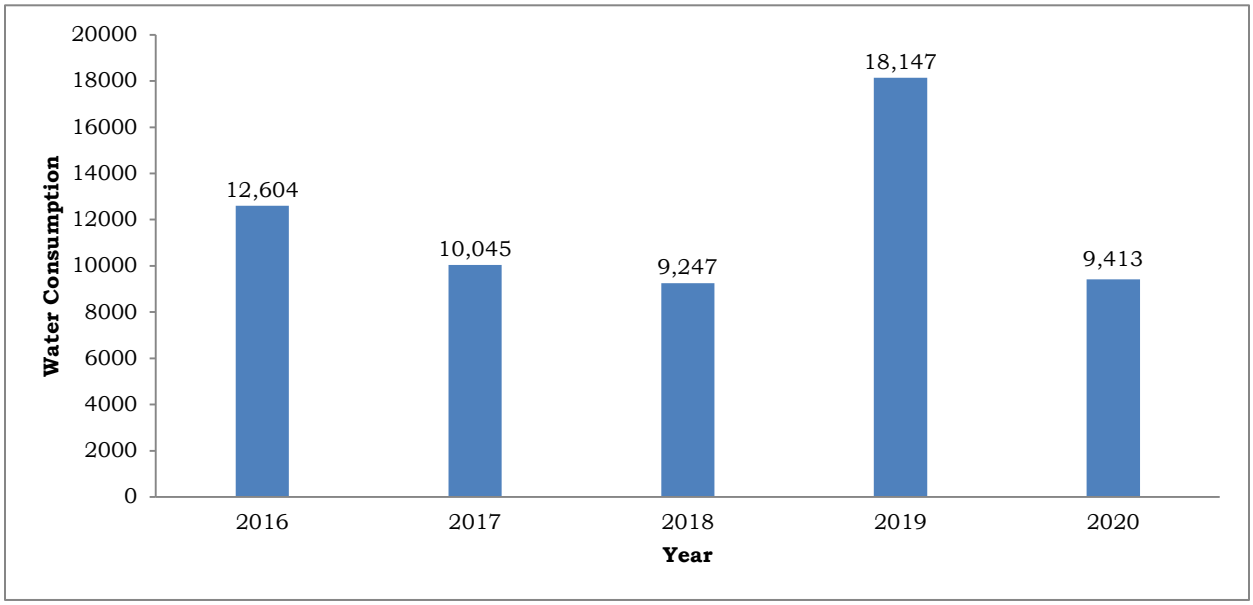
Tables, graphs and maps are used in the chapter to comprehensively present the data on water. The data presented includes water production, water consumption, wastewater generated, water exports and imports.

1.2.1 Maseru Water Consumption

Clean drinking water is consumed by humans and animals. Most sectors of the economy also utilized water during their production processes.

Figure 1.1 depicts Water Consumption (kiloliters) of Maseru – 2016 to 2020. In 2019, the water consumption of Maseru town was 18,146,615 kiloliters. This is the highest water consumption between 2016 and 2020. The lowest water consumption was recorded in 2018, at 9,246,721 kiloliters.

Figure 1.1: Water Consumption (kiloliters '000) of Maseru - 2016 to 2020



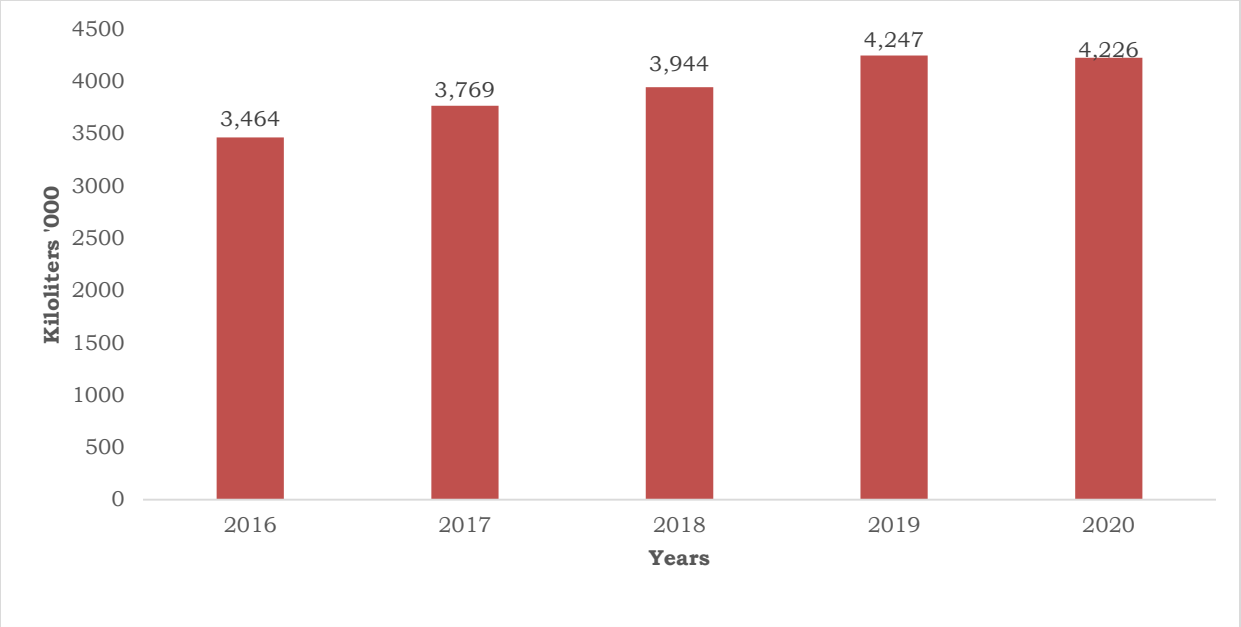
Source: Water and Sewerage Authority

1.2.2 Wastewater

Wastewater includes all the water that has been used by all sectors. Wastewater is channeled to water treatment plants by sewerage systems and also delivered these plants by sewerage trucks.

Figure 1.2 exhibits Urban Wastewater generated in kiloliters from 2016 to 2020. The most wastewater was generated in 2019 with 4,246,692.7 liters. In 2016, the least wastewater was generated at 3,463,959.7 liters. The graph also shows there has been a constant increase in wastewater generated from 2016 to 2019. There was a slight decrease, from 2019 to 2020, of 0.48 percent.

Figure 1.2 Urban Wastewater (liters) generated - 2016 to 2020



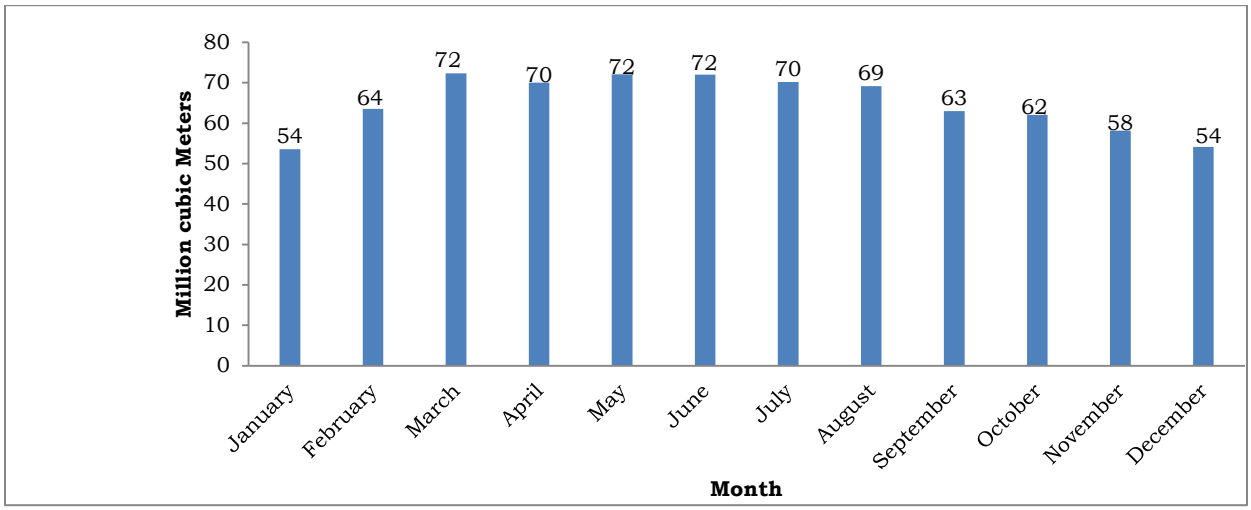
Source: Water and Sewerage Company

1.3 Water Exports

Lesotho exports water to the Republic of South Africa. The quantity of water exported is measured yearly in million cubic meters (mm^3).

Figure 1.3 depicts Water Exports in Million Cubic Meters (mm^3) in 2020. During 2020, the most water exports were in the months of March, May and June at 72 mm^3 (in each of these months). The least water exports in Million Cubic Meters (mm^3) were in the months of January (54 mm^3) and December (54 mm^3).

Figure 1.3: Water Exports in Million Cubic Meters (mm^3) – 2020



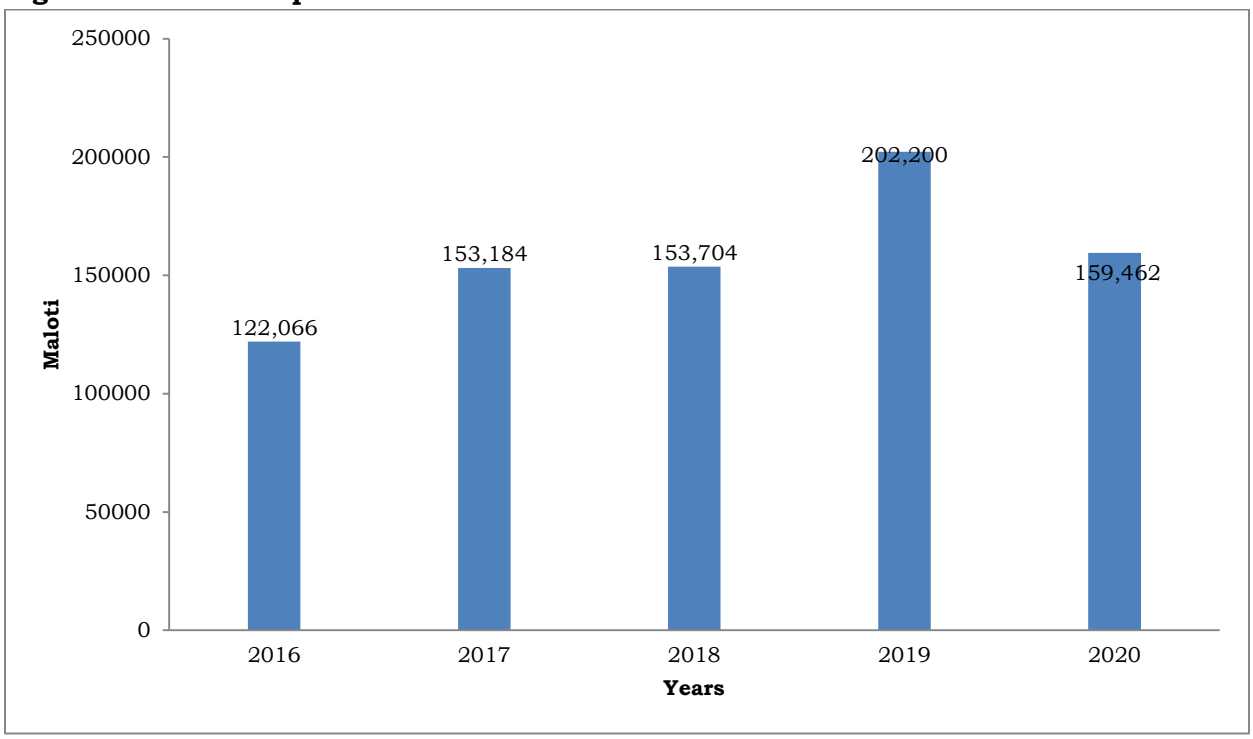
Source: Lesotho Highlands Development Authority

1.4 Water Imports

'Lesotho imports bottled water. These water imports are recorded by the Lesotho Revenue Authority in monetary values.

Figure 1.4 illustrates Water Imports in Maloti '000 from 2016 to 2020. In 2019, water imports were highest at 202,199,734.69 Maloti. From 2016 to 2020, the least water imports were recorded in 2016 at 122,066,237.42 Maloti.

Figure 1.4: Water Imports in Maloti '000 – 2016 to 2020



Source: Lesotho Revenue Authority

1.5 Urban Water Quality

Turbidity is the cloudiness of a fluid caused by suspended particles. It is measured in Nephelometric Turbidity Units (NTU), which should always be less than 5. Chlorine (Cl) is chemical substance that is used to disinfect drinking water. Chlorine levels of up to 4 milligrams per liter are considered safe in drinking water (www.cdc.gov/healthywater/drinking/public/water_disinfection.html, 3/09/2022). Coliforms are bacteria found in plant material, water and soil. Coliforms are measured in Colony Forming Units (CFU).

Table 1.1 exhibits the Urban Water Quality from 2016 to 2020. In 2017, 96 percent of all samples tested had a NTU of less than 5. In 2017, 83 percent of all samples tested had chlorine levels of less than 0.1 milligrams per liter. In 2018, 96 percent of all samples tested had less than 10 CFU per 100 milliliter.

Table 1.2: Urban Water Quality - 2016 to 2020

Parameter (with standards)	2016	2017	2018	2019	2020
Microbiology (Total coliforms <10 CFU/100mL)	94%	94%	96%	94%	95%
Microbiology (e. coli ≤0 CFU/100mL)	98%	98%	99%	97%	99%
Free Chlorine (>0.1mg/L)	88%	83%	96%	96%	92%
Free Chlorine (<1.5mg/L)	97%	96%	94%	96%	95%
Turbidity (<5NTU)	97%	96%	98%	98%	98%

Source: Water and Sewerage Authority

1.6 Summary

Water quality standard for drinking water have to be conformed to always. These standards ensure that drinking water is free of water borne diseases. The highest water consumption in Maseru was in 2019 amounting to 18,146,615 kiloliters. The lowest water consumption was recorded in 2018, at 9,246,721 kiloliters. The most wastewater was generated in 2019 with 4,246,692.7 liters. In 2016, the least wastewater was generated at 3,463,959.7 liters. In 2019, water imports were highest at 202,199,734.69 Maloti. The most water exports were in the months of March, May and June at 72 mm^3 (in each of these months) in 2020.

CHAPTER 2: LAND USE AND COVER

2.0 Introduction

Lesotho is a tiny locked southern African country of 30 355km squared with an average altitude of over 1000m above the sea level. Approximately 9% of the national surface area is arable, and 1.1% is water (Ministry of Health). The topography of Lesotho has led to agro-ecological classification that consists of four regions, namely, the Mountains, the Foothills, the Senqu River Valley and Lowlands. The Mountains occupy approximately 59% of the country and communities in the mountains are predominantly rural and utilize the vast amount of land for livestock farming. The Highland areas consist of rugged terrain, which makes accessibility difficult.

The Senqu River valley is the area along the river from Quthing up the Thaba-Tseka district. It occupies 9% of the total land area of the Lesotho. It has been designated as a lone standing topographic area because it displays unique characteristics of very rich and fertile soil that is intensively used for crop agriculture, mainly sorghum and maize, as well as livestock. Fishing is also a commercial activity of note in areas covered by the Lesotho Highlands Water Project (LHWP). (LHDA report,2016)

Land use involves the management and modification of natural environment or wilderness into built environment such as settlements and semi-natural habitats such as arable fields, pastures and managed woods.

2.1 Scope and Coverage

The coverage in this chapter has been compiled using secondary data comprised of number of shade-nets houses and Hay-grove Tunnels provided by Smallholder Agriculture Development Project (SADP). Area covered by trees provided by the Department of Forestry and Area of leased residential sites around the country by Land Administration Authority (LAA).

2.2 Results

The results have been derived from number of shade-net houses and Hay-grove tunnels from 2016 to 2017, area covered by trees between the periods 2015/2016 to 2019/2020 and land covered by allocated, registered and leased sites for human settlements and other uses from 2016 to 2020.

2.3 Land use under Shade nets-Houses and Haygrove Tunnels

A Shade-net house is a framed structure made of materials such as GI pipes, angle iron, wood or bamboo. It is covered with plastic nets (Nets are made 100 percent Polyethylene thread with specialized UV treatment) having different shade percentages. It provides partially controlled atmosphere and environment by reducing light intensity and effective heat during daytime to crops grown under it. Hence, the year seasonal and off-season cultivation is possible.

Shade-nets are available in different shade percentages or shade factor which are 15 percent, 35percent 40percent 50percent 75percent and 90percent. The 35percent shade factor means – the net cut 35percent of light intensity and would allow only 65 percent of light intensity to pass through the net. http://www.ncpahindia.com/shate-net

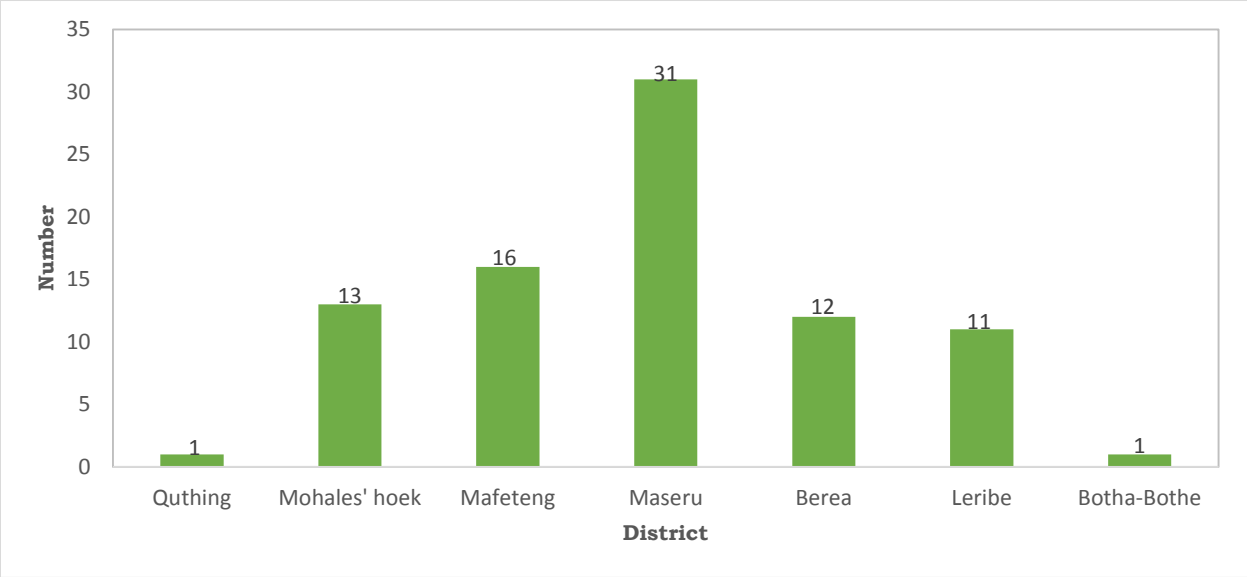
The hay-grove tunnels are a field-scale solution to covering crops, which are semi-permanent and follow the natural contours of the ground. They can be built to any length and there are options for single bay (both bay-types- gothic and Quonset allow for vertical trellising e.g. indeterminate tomatoes and cucumbers) or multi bay tunnels are said to be better suited for crops that can be horizontally trellised e.g. determinate tomatoes, peppers or crops that need no trellis such as strawberries.

2.3.1 Land use under Shade-nets-Houses

The data was collected between the years 2016 and 2017 as the pilot study of cultivation by allocating 85 shade-nets to selected Basotho farmers. It was conducted by SADP in 7 districts across the country.

Figure 2.1 depicts the total number of shade-nets installed by district. It indicates that Maseru farmers obtained 31 shade-nets, which is the highest record amongst all 7 districts while Botha-Bothe and Quthing had the lowest with a record of 1 shade-net each.

Figure 2.1: Number of Shade-nets allocated by District



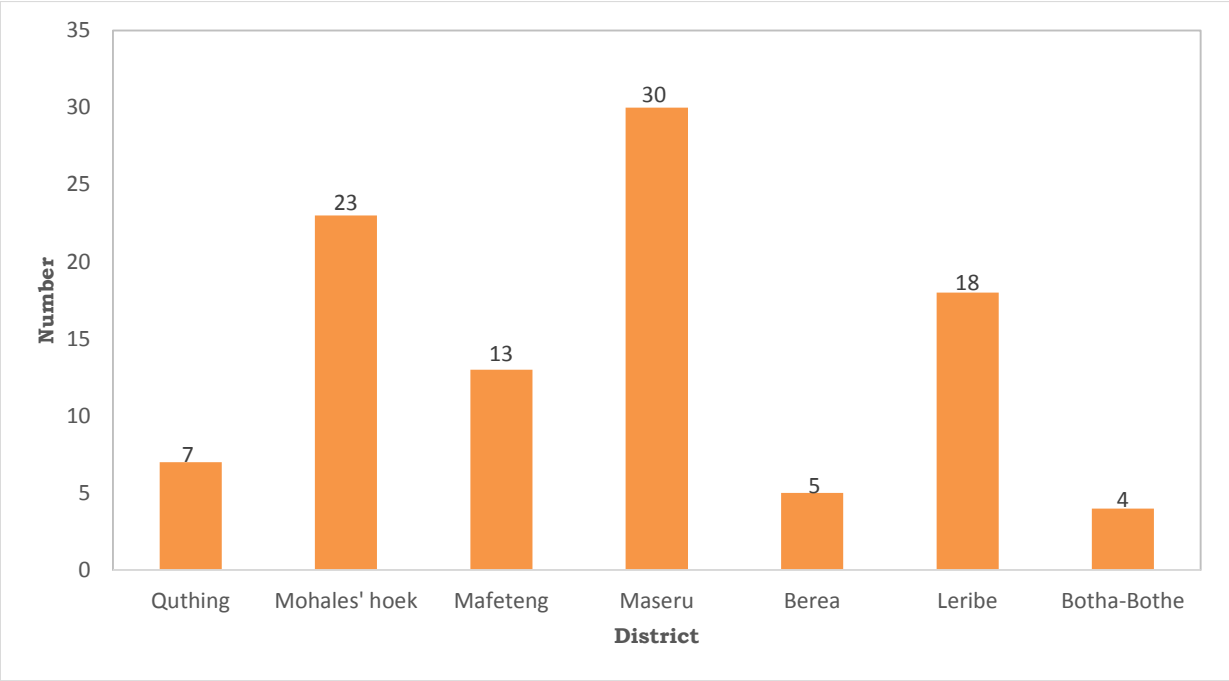
Source: Smallholder Agriculture Development Project (SADP)

2.3.2 Land use under Hay-grove Tunnels

The data was collected between the years 2016 and 2017 as the pilot study of cultivation by allocating 100 Hay-grove Tunnels to selected Basotho farmers and it was conducted by SADP in 7 districts across the country.

Figure 2.2 illustrates the total number of Hay-grove Tunnels installed by district. It indicates that Maseru farmers recorded the highest number (30) of Hay-groove as compared to other districts, followed by Mohale's Hoek with 23. Berea and Botha-Bothe districts had the lowest number amounting to 5 and 4 respectively.

Figure 2.2: Number of Hay-grove Tunnels allocated by District



Source: Smallholder Agriculture Development Project (SADP)

2.4 Land covered by trees

A forest is complex ecosystem consisting of trees buffer the earth and support a myriad of life forms. The trees help create a special environment which, in turn, affects the kinds of animals and plants that can exist in the forest. Lesotho forest cover is 34,404 ha. http://edugreen,teri.res.in

Forests are vital providers of biological resources such as wood for fuel and other domestic uses. They also play a role in the conservation of water resources and in the absorption of carbon (National Environment Secretariat 2000).

Table 2.1 shows the number of forest trees planted and area in hectares from 2015/2016 to 2019/2020. Majority of the forests planted were recorded in 2017/2018 (1,079,857) over an area of 972 hectares, followed by 2016/2017 with

980,763 forests planted on an area of 883 hectares. The least number of forests was in 2018/2019 (479,024) with an area of 431 hectares.

Table 2.1: Number of forest trees planted and area in hectares for 2015/2016-2019/2020

Year	Number	Area
2015/2016	941,202	847
2016/2017	980,763	883
2017/2018	1,079,857	972
2018/2019	479,024	431
2019/2020	523,355	471
Total	**4,004,201**	**3,604**

Source: Department of Forestry

2.5 Fruit Trees

A fruit tree is a tree , which bears fruit that is consumed or used by animals and humans.

Table 2.2 demonstrates the number of fruit trees planted and area in hectares for the period 2015/2016 to 2019/2020. Number of fruit trees planted was highest in 2017/2018 (487,471) on an area of 780 hectares, followed by 2018/2019 with 465,230 fruit trees. The least number of fruit trees planted was 188,425 occupying an area of 301 hectares in 2019/2020

Table 2.2: Number of fruit trees planted and area in hectares for 2015/2016-2019/2020

Year	Number	Area
2015/2016	401,601	643
2016/2017	446,414	714
2017/2018	487,471	780
2018/2019	465,230	744
2019/2020	188,425	301
Total	**1,989,141**	**3182**

Source: Department of Forestry

2.6 Grape Trees

A grape is a fruit, botanically a berry, of the deciduous woody vines of the flowering plant genus Vitis. https://en.wikipedia.org/wiki/Grape.

Table 2.3 presents the number of grape trees planted and area in hectares for the period 2015/2016 to 2019/2020. In 2015/2016, the number of grape trees planted was higher ((58,337) over an area of 44.2 hectares followed by 25,535 grape trees in 2018/2019.The least number of grape trees planted was in 2017/2018 on a smaller area of 1.5 hectares.

Table 2.3: Number of grape trees planted and area in hectares for 2015/2016-2019/2020

Year	Number	Area
2015/2016	58,337	44.2
2016/2017	21,821	16.5
2017/2018	1,976	1.5
2018/2019	25,535	19.3
2019/2020	2,876	2.2
Total	**110,545**	**83.7**

Source: Department of Forestry

2.7 Leased residential sites

Residential area means any real property, which contains a structure or building in which one or more persons reside, provided that the structure or building is properly zoned, or is legally nonconforming, for residential use in accordance with the terms and maps of the village zoning regulations.

A land lease, also called a ground lease, is a lease agreement that permits the buyer to use and possess a piece of land previously owned by the seller. Land leases work very similarly to the way traditional property leases operate, and tenants can enter into both residential and commercial agreements.

Table 2.4 represents area of leased residential sites around the country from 2016 to 2020. The table shows that, there was a drop of 3.38 percent from 2016 to 2017. The highest area of leased sites with area of 974,235 hectares was in 2019.

Table 2.4: Area of Leased Residential Sites from 2016 to 2020

Years	Hectares
2016	537,911
2017	432,778

2018	404,398.1
2019	974,235.6
2020	758,754.5
Total	**3,108,077.2**

Source: Land Administration Authority (LAA)

2.8 Summary

In 2016 and 2017 Maseru farmers obtained 31 shade-nets, which gave it the highest record amongst all 7 Districts while Botha-Bothe and Quthing had the lowest with a record of 1 shade net each. In the same period Maseru, farmers obtained 30 of the total Hay-grove tunnels. It was the highest record amongst all 7 Districts, followed by Mohale's Hoek with 23 while Berea and Botha-Bothe were the lowest with a record of 5 and 4 respectively.

In the period 2017/2018 the highest planted number of forest trees was (1,079,857) over an area of 972 hectares while the least number recorded was in 2018/2019 with (479,024trees) with an area of 431 hectares. The highest number of fruit trees planted was in 2017/2018 at (487,471) on an area of 780 hectares and the least number of fruit trees planted was 188,425 occupying an area of 301 hectares in 2019/2020.The number of leased residential sites records show that highest area of leased sites with area was in 2019 with 974,235 hectares and the lowest was in 2018 with 404,398.1 hectares.

CHAPTER 3: BIODIVERSITY

3.0 Introduction

Biodiversity is the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.

Biodiversity is crucial to a planet's survival because as a result of it people have food, construction material, raw material for industry, medicine as well as the basis for all improvements to domesticated plants and animals. Biodiversity helps maintain ecosystem functions and evolutionary processes and stores and cycles nutrients essential for life, such as carbon, nitrogen and oxygen. It also recharges ground water, protects catchments, and buffers extreme water conditions (Stork, 2009).

3.1 Scope and coverage

The results for this chapter are for the entire country and the data used is secondary collected from different ministries from 2000 to 2020. The data is also collected from privately owned nurseries in the country.

3.2 Results

The analysis on Biodiversity statistics by charts and tables are presented. The results indicate the number of different animal species, plant species, planted trees and protected areas.

3.3 Flora and Fauna

Lesotho has high level of plant endemism which is more confined to Drakensberg Alpine Centre biodiversity hot spot area. It is estimated that Lesotho has at least 54 endemic species such as Aloe polyphylla (kharetsa), Aponogeton ranunculiflorus (Sehlabathebe water lily, lijo tsa lihohoana) and Gnidia singularis (Moomang). Aloe polyphylla is the country's best known and largest endemic. Aloe polyphylla and other species such as Aloe ferox (lekhala la Quthing), Perlagonim sidoides (khoara) Merxmuellera Macowanii (moseha) and Hypoxis hemerocallidea (moli) are plants of socio-economic value to Lesotho (Lesotho Environment Outlook Report 2014).

Table 3.1 shows endemism of plant species in Lesotho for the year 2000. The number of plant species confirmed near-endemic was higher (30) followed by confirmed endemic (13) plant species. Plant species suspected endemic had the least number 4.

Table 3.1 Endemism of Plant Species in Lesotho-2000

Endemism	Number
Confirmed endemic	13
Suspected endemic	4
Confirmed near-endemic	30
Suspected near-endemic	7
Total	**54**

Source: National Environment Secretariat

Fauna in Lesotho consists of birds, mammals, herpotofauna and fish. Major conservation efforts have focused specifically on birds such as Geronticus calvus (Mokhotlo, Southern Bald Ibis) and Gypaetus barbatus (Ntsu kobokobo, Bearded vulture). Lesotho has only 14 recorded fish species such as Pseudobarbus quathlambae (Maloti Minnow) and Rock Catfish. Maloti minnow is the only endemic fish in Lesotho. Species richness of fish in Lesotho is very low compared to other countries in Southern Africa (Lesotho Environment Outlook Report 2014).

Table 3.2 presents the number of fish species in Lesotho in 2000. The Cyprinidae constitutes the largest number (7) of fish species followed by Centrarchidae with three species. Bagridae and Clariidae had the least number (1) of species.

Table 3.2: Number of Fish Species -2000

Fish Family	Number of species
Salmonidae	2
Cyprinidae	7
Bagridae	1
Clariidae	1
Centrarchidae	3
Total	**14**

Source: National Environment Secretariat

3.4 Botanical Gardens

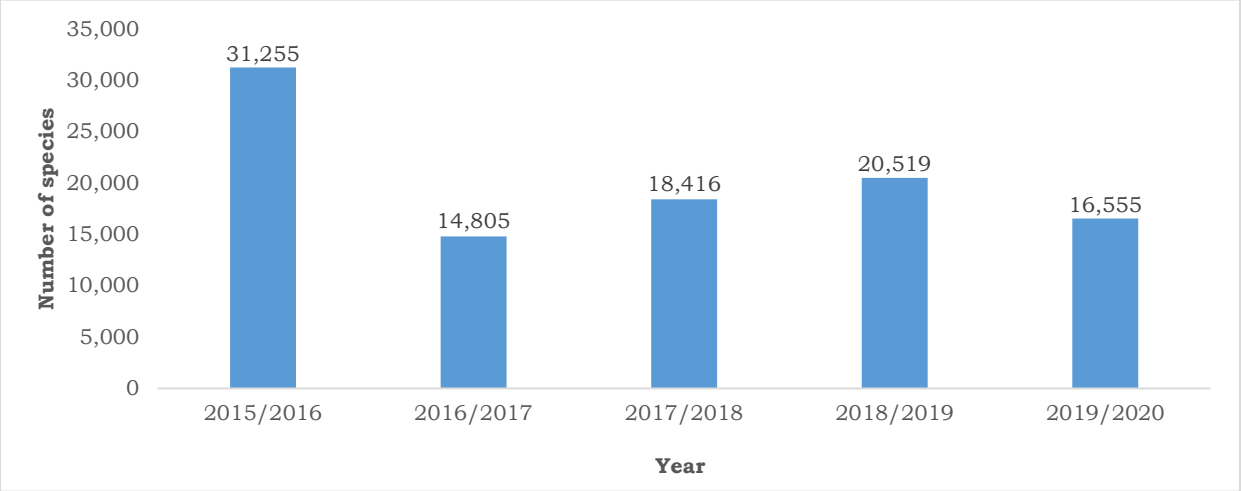
Botanical gardens are institutions that maintain the living plant collections of different varieties of plants, including the ornamental and the cultivated ones, wild, medicinal, of economic importance, of various geographical regions and of special interest. Botanical gardens supply wide range of plant species, seeds, flowers, fruits for botanical research. Botanical gardens conserve and propagate rare species and genetic diversity (Trisha, 2020).

3.4.1 Plants Propagation

Plant propagation is the process of producing a new *plant* from an existing one.

Figure 3.1 illustrates the total number of propagated plant species at Katse Botanical Garden for the periods 2015/2016 to 2019/2020. The total number of propagated seedlings decreased from 31,255 in 2015/2016 to 14,805 seedlings in 2016/2017. An increase by 24.0 percent was observed between 2016/2017 and 2017/2018. The lowest number (14,805) of propagated seedlings was in 2016/2017

Figure 3.1: Number of Propagated Plant Species at Katse Botanical Garden for 2015/2016 - 2019/2020



Source: Katse Botanical Garden (KBG)

Table 3.3 demonstrates the Propagation of rare and threatened plant species at Katse Botanical Garden (KBG) in 2016/2017. Leucosedia serecia (cheche) was the most propagated with 2,637 species followed by Tulbaghia alliacea (sefothafotha) with 1,558. Kniphofia caulescence was the least propagated with 15 species.

Table 3.3: Propagation of Rare and Threatened Plant Species at KBG - 2016/2017

Plant Species	Family	Number of seedlings
Aloe polyphylla	Asphodelaceae	693
Sutherlandia montana	Fabaceae	898
Galtonia viriodiflora	Asparagaceae	1,309
Kniphofia caulescence	Asphodelaceae	15
Cotyledon orbiculata	Crassulaceae	1,025
Kniphofia ensfolia	Asphodelaceae	756
Leucosedia sericea	Rosaceae	2,637
Agapanthus campanalatus	Amaryllidaceae	1,295
Delosperma obtusume	Aizoaceae	934
Hesperantha coccinea	Iridaceae	953
Heteromorpha trifoliate	Apiaceae	358
Scilla natalensis	Hyacinthaceae	1,239
Tulbaghia allicea	Alliaceae	1,558

Eucomis autumnalis	Asparagaceae	516
Aloe broomii	Asphodelaceae	619
Total		**14,805**

Source: Katse Botanical Garden (KBG)

Table 3.4 shows the number of the propagated plant species at Katse Botanical Garden (KBG) for the period 2015/2016 to 2019/2020. The highest number (136,98) of Leucosidea sericea was recorded in 2018/2019. Leucosedia sericea increased from 1,202 in 2017/2018 to 13,698 in 2018/2019. There has been a continuous decline in the number of Cotyledon orbiculata (sereleli) from 2015/2016 to 2019/2020. Kniphofia caulescence (14) was the least propagated in 2015/2016.

Table 3.4: Number of the Propagated Plant Species at KBG for 2015/2016 - 2019/2020

Scientific Name	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Aloe polyphylla	1,106	693	4,046	863	733
Leucosidea sericea	1,837	2,637	1,202	13,698	8,809
Cotyledon orbiculata	3,786	1,025	289	140	90
Heteromorpha trifoliata	3,457	358	38	164	639
Delosperma obtusum	3,806	934	9	0	0
Agapanthus campanalatus	2,396	1,295	19	0	0
Hesperantha coccinea	719	953	0	419	53
Galtonia viridiflora	2,773	1,309	1,631	0	0
Tulbaghia Aliacea	2,396	1,558	1,347	0	0
Eucomis autumnalis	78	516	767	342	120
Boophane disticha	164	0	10	13	0
Olea africana	138	0	13	205	363
Kniphofia caulescence	14	15	128	0	0
Kniphofia ensfolia	0	756	18	101	0
Sutherlandia montana	0	898	146	0	17
Aloe broomi	0	619	322	197	0
Elephantina elephantoriza	0	0	68	98	40
Diospyros austro-africana	0	0	177	1,349	488
Aloe ferox	0	0	56	615	55
Total	**22,670**	**13,566**	**10,286**	**18,204**	**11,407**

Source: Katse Botanical Garden (KBG)

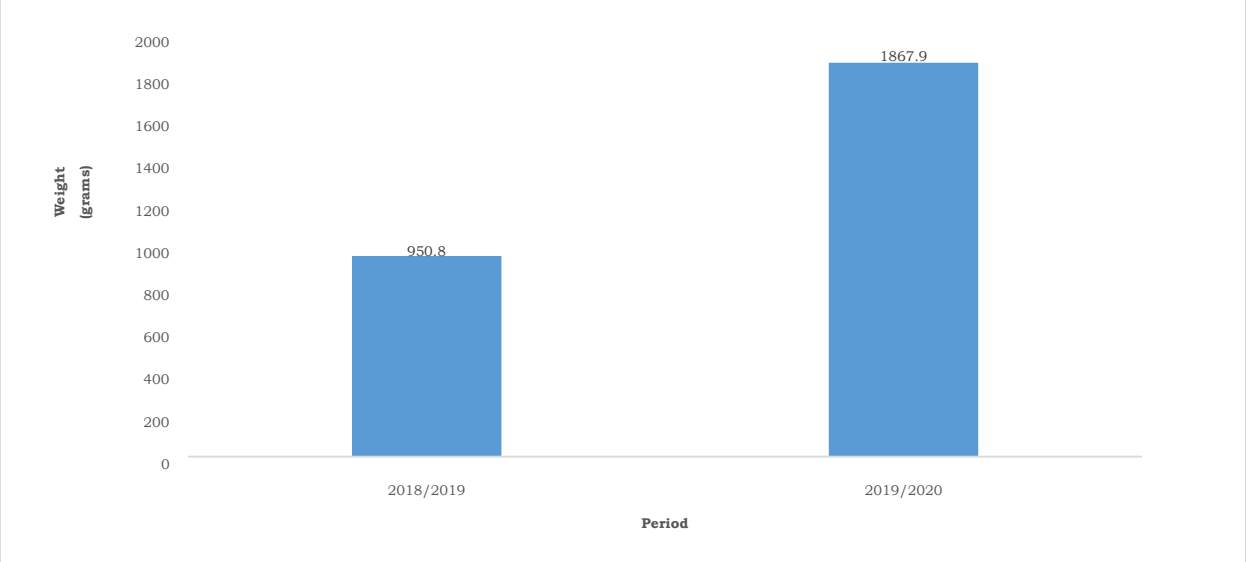
3.4.2 Seeds collection

Seeds collection is performed using mechanical seed stripers, vacuums or by hand. Collectors travel to locations near the target reclamation site. Large known populations of targeted species are monitored for seed ripeness.

https://www.twinsistersnursery.com/about/our-seed-collection-and-germination-process

Figure 3.2 illustrates the weight (grams) of seeds collected at Katse Botanical Garden for the period 2018/2019 to 2019/2020. The highest seeds collection was obtained in 2019/2020 (1867.9 grams). In 2018/2019, weight of collected seeds was low (950.8grams).

Figure 3.2: Weight (grams) of Seeds collected at Katse Botanical Garden-2018/2019 - 2019/2020



Source: Katse Botanical Garden

Table 3.5 presents the weight (grams) of seeds collected at Katse Botanical Garden in 2019/2020. Boophane disticha seeds had the largest weight (1,650 grams) followed Zantedeschia albomaculata with 147.9grams. Xysmabolium undulata seeds had the least collection with weight of 0.1 grams.

Table 3.5: Weight (grams) of Seeds collected at Katse Botanical Garden -2019/2020

Species Name	Weight (g)
Zantedeschia albomaculata	147.9
Aloe ferox	47.5
Sutherlandia montana	7.5
Boophane disticha	1,650
Lobelia sp	0.4
Gladiolus permeabilis	3
Xysmalobium undulata	0.1
Albuca setosa	2.8

Bulbine narcissifolia	8.4
Total	**1867.6**

Source: Katse Botanical Garden

3.4.3 Flowering plants

Flowering plants bear flowers; angiosperms.

Table 3.6 presents family and genera of the flowering plants at the National University of Lesotho (NUL) Botanical Garden in 2019/2020. The Fabaceae dominates other families with 253 species followed by Poaceae with 232 species. The Santalacea have the smallest number of species (21).

Table 3.6: Family and Genera of Flowering Plants at NUL Botanical Garden 2019/2020

Plant family	Genera	Species
Poaceae	87	232
Fabaceae	78	253
Solanaceae	6	30
Thymelaceae	7	28
Orchidceae	17	30
Rosaceae	19	60
Rubeaceae	23	49
Scrophularcaceae	23	123
Santalaceae	2	21
Brasscicaceae	18	38
Caryophylaceae	16	45
Crassulaceae	4	37
Gentianaceae	3	26
Geraneaceae	4	37
Lamiaceae	23	53
Onagraceae	7	31
Ericaceae	5	30
Total	**342**	**1,123**

Source: National University of Lesotho (NUL)

3.4.4 Plants uses

Basotho use plants for different purposes: firewood, medicine, food, making crafts, building and ornamentals. Plants are mostly used by traditional doctors for healing purposes.

Table 3.7 shows uses of plant species found at the National University of Lesotho Botanical Garden in 2019/2020. Most plants are medicinal with the largest number

of 34 followed by plants which are used for food (12). Majority of the plant species have more than one use. Plant species which are used as medicinal or ornamental have the highest number of 5.

Table 3.7: Uses of plant species at National University of Lesotho Botanical Garden in 2019/2020

Uses	Number
Firewood	6
Ornamental	14
Food	12
Medicinal	34
More than one use	
Food/ornamental	1
Food/firewood	1
Food/medicinal	1
Firewood/ornamental	4
Medicinal/firewood	1
Medicinal/food	2
Medicinal/ornamental	5
Ornamental/industrial	1
Ornamental/medicinal	1
Total	**83**

Source: National University of Lesotho (NUL)

3.5 Flowers

Flowers are very important in nature. Flowers play a crucial role in our lives; they have been used for generations to express the thoughts and feelings words cannot explain Besides adding colour, texture and biodiversity to gardens and ecosystems, flowers are botanically important structures and essential sources of food for many organisms (Williams, 2019).

Table 3.8 shows the imported flowers at Felleng Blooming Place in 2016, 2017 and 2020. There were no records provided pertaining to 2018 and 2019. The number of Petunia flowers imported was highest (1,232) in 2020. A decrease of 67.0 percent was observed between 2016 and 2017 with regard to Petunia flowers. It was also observed that Lobelia blue flowers were the least imported throughout the years.

Table 3.8: Imported Flowers at Felleng Blooming Place for 2016, 2017 and 2020

Flowers	2016	2017	2020
Dianthus	224	84	517
Lobelia Blue	6	0	12
Petunia	1,124	410	1,232
Alyssum	94	12	92
Gazania	42	0	128
Salvia red	78	12	0
Salvia mix	30	18	24
Marigold	138	6	54
Verbena	93	42	60
Anthirrhinium	48	12	33
Begonia	234	36	38
Coleus Mix	18	12	18
Dahlia mix	36	24	0
Celosia mix	72	12	35
Impatiens	232	42	121
Hypoestes	90	54	18
Total	**4,575**	**2,793**	**4,402**

Source: Felleng Blooming Place

3.6 Fish

Fish fall under vertebrates and are sources of protein. The Maloti Minnow is the only endemic fish in Lesotho. Introduction of rainbow trout in the Katse dam has proven harmful to the survival of Lesotho's endemic fish. It has been found that the exotic Rainbow trout preys on Maloti Minnow (Lesotho Environment Report 2014)

Table 3.9 shows production/Harvest of rainbow trout in metric tonnes from 2016/2017 to 2019/2020 excluding 2018/2018. Records were no available for the latter year. Production/harvest of rainbow trout was higher (14,426 metric tonnes) in 2016/2017 followed by 1,906.60 metric tonnes in 2019/2020. Production was low (342 metric tonnes) in 2017/2018.

Table 3.9: Production/Harvest of RainbowTrout in metric tonnes - 2016/2017 - 2019/2020

Year	Production/Harvest
2016/2017	14,426
2017/2018	342
2019/2020	1,906.60
Total	**16,674.60**

Source: Department of livestock

3.7 Protected Areas

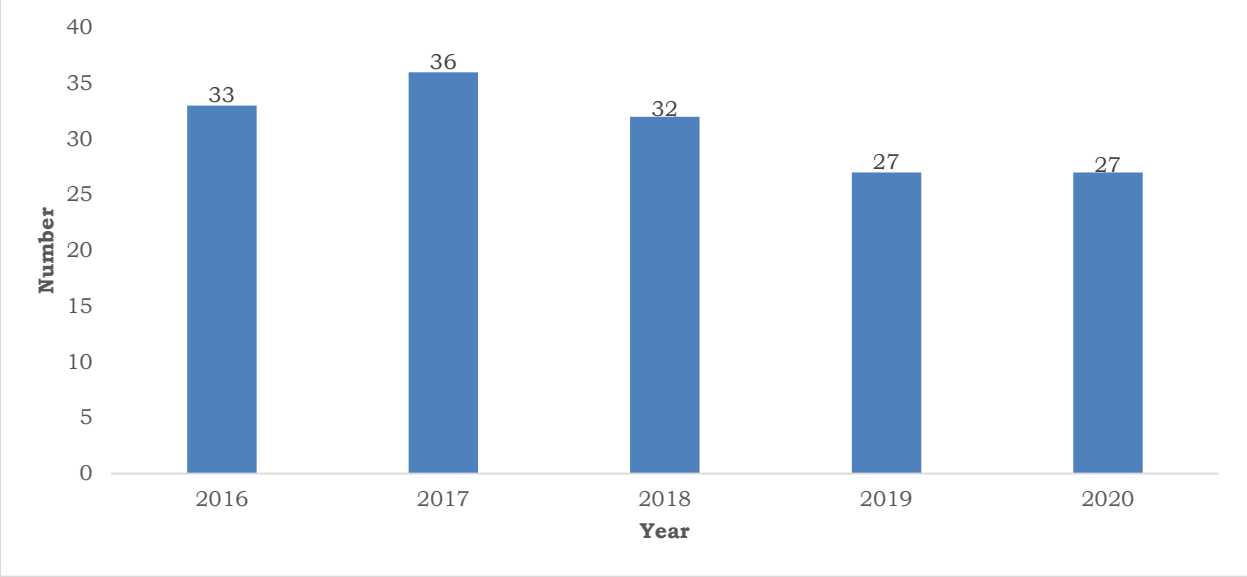
Lesotho has very little area under protection with only 14,299 hectares of it being formally protected. The three formal protected areas: Sehlabathebe National Park, Bokong Nature Reserve and Tsehlanyane National Park are currently the only effective conservation areas in Lesotho (Lesotho Environment Outlook:2014).

3.7.1 Snake Parks

Snake parks are a home to a wide range of snakes such as adders, pythons, vipers, cobras and other snakes.

Figure 3.3 displays the number of snakes at Qacha's Nek Snake Park for the period 2016 to 2020. The number of snakes was highest in 2017 (36), followed by 2016 with 33 snakes. The least number of snakes was observed in 2019 and 2020 with 27 for each year.

Figure 3.3: Number of Snakes at Qacha's Nek Snake Park for 2016-2020



Source: Snake Park

Table 3.10 depicts the type of faunal species around the Snake Park in 2018/2019. Invertebrates make up the largest number (24) of the faunal species followed by Birds with 23 species. Mammals have the smaller number (2).

Table 3.10: Type of Faunal Species around the Snake Park in 2018/2019

Faunal species	Number
Birds	23
Mammals	2
Reptiles	3

Invertebrates	24
Total	**52**

Source: Department of Environment

3.7.2 Invertebrates

More than 90% of the animals are invertebrates among the estimated 15-30 million animal species. Invertebrates exist about anywhere. Terrestrial invertebrates include insects, spiders, millipedes as well as worms https://byjus.com/biology/invertebrates.

Table 3.11 presents the types of invertebrates around the Snake Park in 2018/2019. Insects have the highest number (14) followed by Arachnids with 7 species. Annelids have the least number (1).

Table 3.11: Types of Invertebrates around the Snake Park in 2018/2019

Invertebrates	Number
Insects	14
Arachnids	7
Myriapods	2
Annelids	1
Total	**24**

Source: Department of Environment

Table 3.12 shows the number of flora by type around the Snake Park in 2018/2019. Herbs constitute the largest number with 45 species followed by Shrubs with 14. Sedge and Orchid are the least with 1 each.

Table 3.12: Number of Flora by Type at the Snake Park in 2018/2019

Type of flora	Number
Forb	7
Grass	13
Herb	45
Orchid	1
Sedge	1
Shrub	14
Succulent	3
Tree	8
Total	**92**

Source: Department of Environment

3.8 Summary

The highest number of propagated rare and threatened species at Katse Botanical Garden was 31,255 in 2015/2016, the lowest number was recorded in 2016/2017 (14,805). Seeds collection was high in 2019/2020 with a weight of 1867.9 grams. Most plants at NUL botanical garden are Medicinal (34) and most of the flowering plants belong to a family of Fabacea. Production/Harvesting of rainbow trout was highest in 2016/2017 (14,426 metric tonnes).

The highest number of snakes at Qacha's Nek was 36 in 2017 and remained the same (27) in 2019 and 2020. There were 92 Plant species and 52Aanimal species around the Qacha's Nek Snake Park in 2018/2019.

ANNEX

Table 1: Volume of Water Produced and Billed in Kiloliters - 2021/2022

	Water produced	Water billed	Non-revenue water
Maseru	14 984 000	6 452 250	8 531 750
Leribe	401 039	188 328	212 711
Maputsoe	618 995	190 351	428 644
TY	397 980	269 549	128 431
Mafeteng	701 218	358 610	342 609
Mohales' Hoek	616 261	236 182	380 079
Botha-Bothe	340 060	135 511	204 550
Quthing	263 932	95 081	168 851
Peka	99 974	37 744	62 229
Mapoteng	266 295	87 302	178 992
Morija	84 260	50 778	33 482
Thaba-Tseka	157 819	105 736	52 083
Qacha's Nek	209 020	101 258	107 762
Mokhotlong	279 226	130 285	148 941
Roma	286 210	208 161	78 049
Semonkong	30 771	19 226	11 546
Metolong	15 752 450	-	-

Source: Water and Sewerage Authority

Table 2: Dam levels of Metolong - 2016 to 2020

Period	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
2016	1648.27	1647.48	1650.40	1651.10
2017	1666.10	1664.88	1662.89	1662.10
2018	1669.79	1670.78	1670.16	1668.18
2019	1669.29	1670.46	1668.88	1668.15
2020	1671.00	1670.36	1668.47	1671.01

Source: Department of Water Affairs

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