



Bioenergy and Food Security Projects
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LESOTHO

BEFS COUNTRY BRIEF



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1. BEFS

1.1 BIOENERGY AND FOOD SECURITY

Increasing costs of fossil fuels, the threat of climate change and the need to increase energy security and access have put alternative renewable energy sources, including bioenergy, high on the development agenda. Compared with other sources of energy, bioenergy potentially offers some developmental advantages. Bioenergy can target and stimulate the agriculture sector, a critical sector for development and poverty reduction, while improving energy access, creating a new market for producers, offering new employment opportunities, and potentially contributing to environmental objectives. Nevertheless, there are concerns regarding the actual viability of the sector and its environmental and socio-economic sustainability, also in terms of potential competition with food security.

1.2 THE BIOENERGY AND FOOD SECURITY APPROACH

To date, the rush to develop bioenergy as an alternative to fossil fuels has tended to occur in the absence of an understanding of the associated risks and benefits. In order to assist governments in gaining a proper understanding of the issues at stake, FAO has developed the Bioenergy and Food Security (BEFS) Approach.

FAO's **Bioenergy and Food Security (BEFS) Approach** aims to assist policy-makers in assessing the interplay between natural resource availability, bioenergy production potential, rural development and food security, and in strengthening their capacity to manage the trade-offs associated with bioenergy development.



1.3 THE BEFS COUNTRY BRIEF

Part of the first stage of the implementation of the BEFS Approach in a country, is to undertake a review of the agriculture, energy and food security situation at domestic level. This review provides the basis for the identification of potential bioenergy sources, and for a preliminary assessment of potential risks associated with the development of the sector.



The BEFS Approach consists of a multidisciplinary and integrated set of tools and guidance that can support countries throughout the following key steps of the bioenergy policy development and implementation process:

- **Identification of the key issues** surrounding **bioenergy and food security**, based on the conceptual foundation provided by the BEFS Analytical Framework, and through an **institutionalized dialogue** among relevant national stakeholders;
- **Assessment of the sustainable bioenergy potential**, based on an assessment of **land suitability** and **production costs**, and through an **analysis** of the **environmental** and **socio-economic** dimensions and implications of different bioenergy development pathways, with particular emphasis on food security;
- **Risk prevention and management**, through good environmental and socio-economic practices and related policy instruments;
- **Investment screening and appraisal** through an assessment of the viability and sustainability of proposed bioenergy investments/projects;
- **Impact monitoring, evaluation and response** at both national and project levels; and
- **Capacity building** both at **technical** and **policy** level through training on the above technical tools and guidance.

The BEFS Approach helps countries design and implement sustainable bioenergy policies and strategies, by ensuring that bioenergy development fosters both food and energy security, and that it contributes to both agricultural and rural development in a climate-smart way.

2. COUNTRY OVERVIEW

2.1 QUICK FACTS

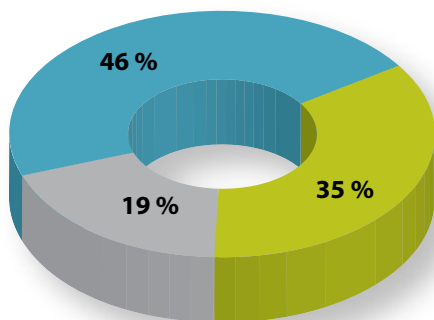
Lesotho is a small landlocked country bordered on all sides by South Africa and has a total area of 30,360 square kilometers¹. Lesotho, which lies entirely above 1,000 metres elevation¹, has a subtropical to semi-arid climate with four topographical zones, and an average annual rainfall of 788 mm². The population in 2010 was 2,171,318 and increasing by an average of one percent per annum³. Of this, 73 percent was classified as rural in 2010, compared to over 80 percent in 1999³.



2.2 ECONOMY

In 2009, Lesotho's GDP grew by 0.9 percent. Between 1999 and 2009, GDP per capita increased from \$ 365 to \$ 471 dollars (in constant US dollars)³. In 2010, the inflation rate was 3.5 percent³. In the same year, trade equaled 157.7 percent of Lesotho's GDP, and foreign direct investments equaled 5.4 percent of the latter³. In 2009, services were the most important sector, with a share of GDP amounting to 58 percent, up from 35 percent in 1999. During the same period, the share of the industrial sector decreased from 46 percent to 34 percent and the share of agriculture from 19 percent to 8 percent (**Figures 1,2**).

FIGURE 1: LESOTHO GDP BY SECTOR (1999)



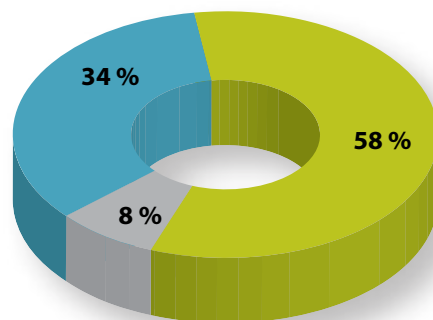
Source: WDI (2010)

Agriculture

Industry

Services

FIGURE 2: LESOTHO GDP BY SECTOR (2009)



Source: WDI (2010)

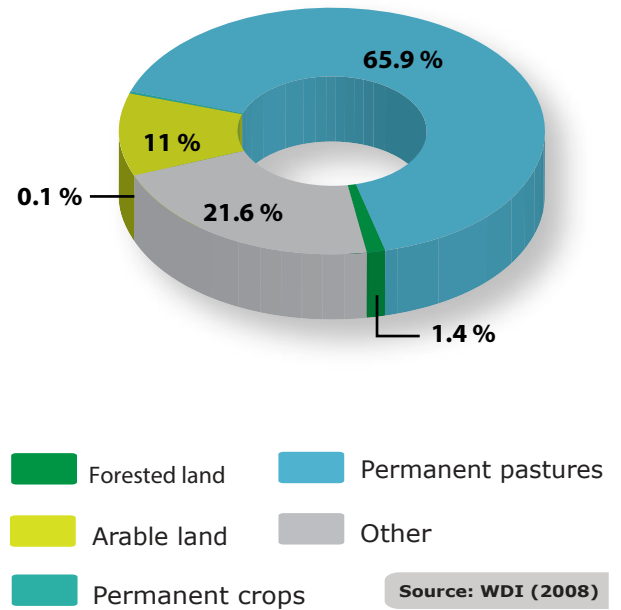
3. AGRICULTURE AND BIOMASS

3.1 LAND AND WATER

Lesotho has a total of 23,373 square kilometers of agricultural land, or 77 percent of total land available² (Figure 3). Of that, 11 percent is classified as arable land³. The country has over 160 billion cubic meters of renewable water resources available, of which 1.6 percent is withdrawn annually⁴. Of the total water withdrawn each year, around 40 percent is used in the industrial and municipal sectors⁴.



FIGURE 3: LESOTHO LAND USE (2008)



3.2 AGRICULTURE AND LIVESTOCK

The agricultural sector employs approximately 60 percent of the labour force and contributes just 0.2 percent of total exports^{2,3}. The main farming system in Lesotho is rain-fed subsistence farming, with low productivity levels.

Potatoes are the main crop produced in Lesotho in terms of volume, followed by maize and vegetables. Maize flour and preserved vegetables are the main export crops in terms of value. Between 1999 and 2009, maize production decreased by 54 percent and potato production by 2 percent, while vegetable production increased 50 percent (Figure 4).

FIGURE 4: LESOTHO CROP PRODUCTION - TONNES (2009)

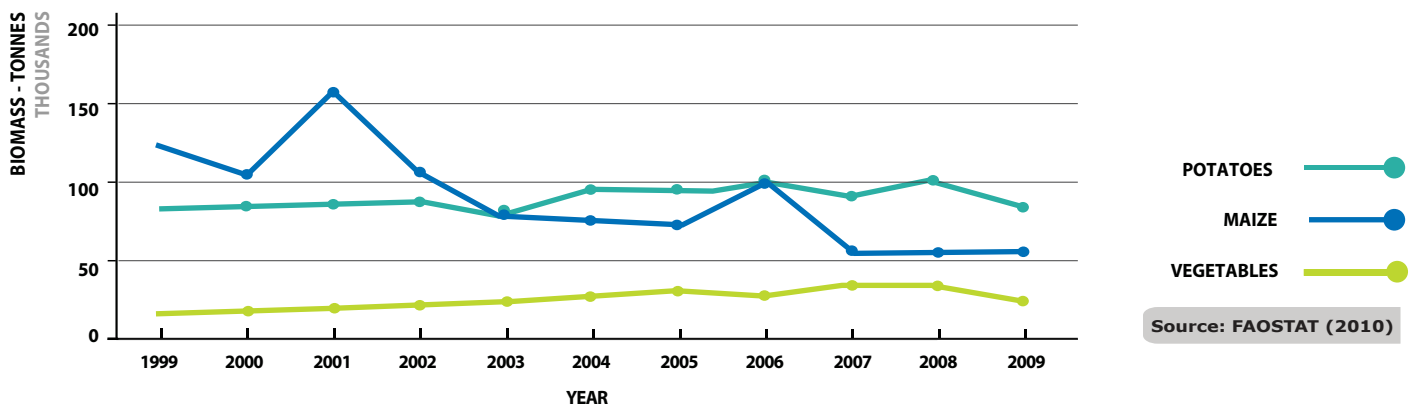
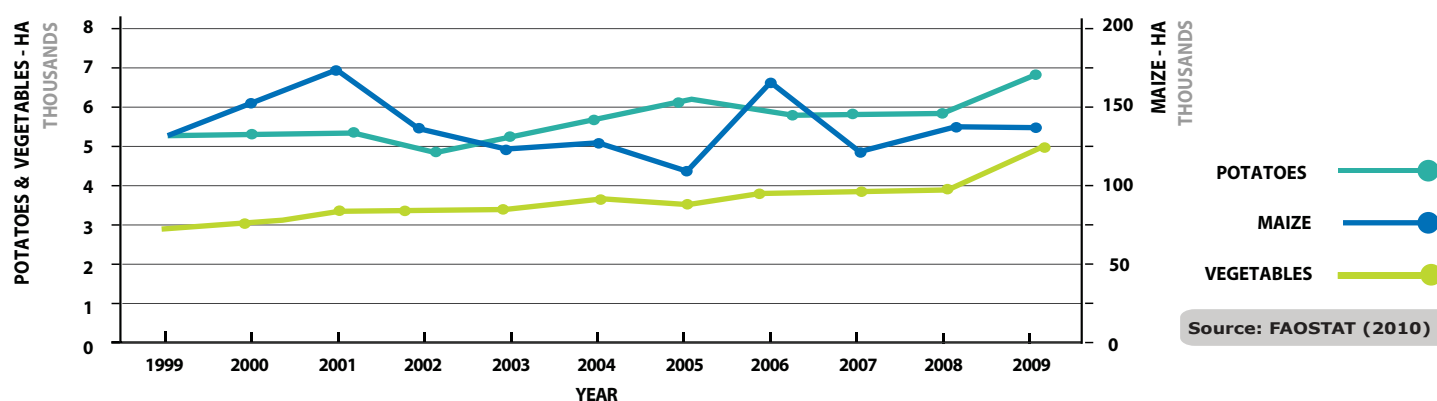
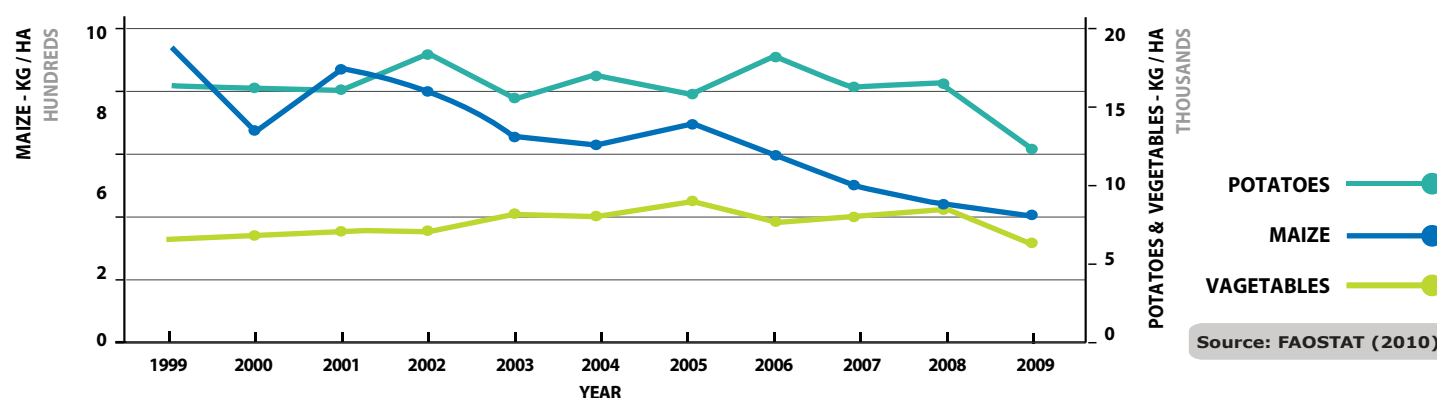


FIGURE 5: LESOTHO AREA HARVESTED - HECTARES (2009)



With regard to maize, the decrease in production was due mainly to a reduction in yields, which amounted to 56 percent. Concerning potatoes, the reduction in yields by 24 percent was compensated by an increase in the area harvested of 30 percent. Vegetable production increased due to a 75 percent increase in area harvested despite a 14 percent decrease in yields (Figures 5,6).

FIGURE 6: LESOTHO CROP YIELD- KILOGRAM/HECTARE (2009)



A considerable share of agricultural output is wasted due to post-harvest losses (Table 1). In 2009, 10 percent of the maize and potatoes and 14 percent of the vegetables consumed domestically were lost to waste².

TABLE 1: LESOTHO CROP UTILIZATION (2009)

Commodity	Production	Domestic Consumption	Food Supply	Processing	Wastage	Feed	Seed	Other Utility
	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes
Potatoes	83 871	93 871	84 484	-	9 387	-	-	-
Maize	51 126	369 193	320 856	2 778	38 284	5 000	2 276	-
Vegetables	28 427	40 952	35 067	-	5 885	-	-	-

Source: FAOSTAT (2009)

With regard to livestock, permanent pastureland accounts for 65.9 percent of total available land according to 2010 data³. Over 1.4 million sheep, one million goats, 600 thousand cattle, 144 thousand asses, 83 thousand pigs, and 75 thousand horses are raised in Lesotho².

3.3 POLICY

The *Agricultural Sector Strategy*, which was adopted in 2003, outlines six main goals, which are: improved food security; reduced poverty; sustainable environmental conservation and management; improved production efficiency; improved income distribution; and increased agricultural sector contribution to GDP⁶.

4. FOOD SECURITY

4.1 NUTRITION

In Lesotho, stunting was found in 39 percent of children under the age of five in 2010⁷. Maize makes up 54.8 percent of the average daily calorie intake, followed by wheat with 13.7 percent and sugar with 6.6 percent (**Table 2**). Together, these three staple crops account for 75.1 percent of the average daily calorie intake, while animal products contribute 5.9 percent of the latter.

4.2 FOOD SECURITY AND FOOD PRICES

Lesotho is classified as a Low Income Food Deficit Country. Currently, 57 percent of the population lives below the poverty line⁸ and 14 percent is undernourished⁷. With a high percentage of the country's population living in poverty, food security is a national concern. Lesotho is a net importer of maize, wheat, and sugar, which are the main staple crops. In 2009, imports accounted for 84.5 percent of domestic maize consumption, 92.9 percent of domestic wheat consumption, and 100 percent of sugar consumption (Table 3). Potential increases in the price of these crops on the international market can thus affect the trade balance, as well as the welfare of net consuming households.

TABLE 2: LESOTHO FOOD CROP CALORIC INTAKE (2009)

Ranking	Commodity	Calorie Share (%)
1	Maize	54.8
2	Wheat	13.7
3	Sugar	6.6
4	Sorghum	4.7
5	Potatoes	3
6	Root & Tubers	3
Subtotal Food Crop share		85.8
Animal Products Share		5.9
Total Calories (kcal/capita/day)		2 371

Source: FAOSTAT (2009)

TABLE 3: LESOTHO NET FOOD CROP TRADE (2009)

Commodity	Production	Import	Export	Stock Variation	Domestic Consumption	Import Share of Consumption
	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	%
Maize	57 126	312 778	711	0	369 193	84.5
Wheat	7 420	96 558	63	0	103 916	92.9
Sugar	—	34 270	—	0	34 270	100

Source: FAOSTAT (2009)

4.3 POLICY

The *Lesotho Food Security Policy*, which was adopted in 2005, has the overall goal of improving food stability at all levels and food utilization at household level⁶. In order to achieve this goal, a number of specific objectives are outlined within this policy: to promote agricultural and food production; to ensure access to food through employment and effective policy monitoring; to promote infrastructure and services to support livelihoods; to promote public transfers and safety nets; to mainstream HIV/AIDS within food security policies; to manage commercial imports, food aid deliveries and food stocks effectively; to promote improved household level food utilization; to develop improved food security and vulnerability information systems; and to strengthen institutional frameworks for implementing, evaluating, and monitoring food security measures⁶.

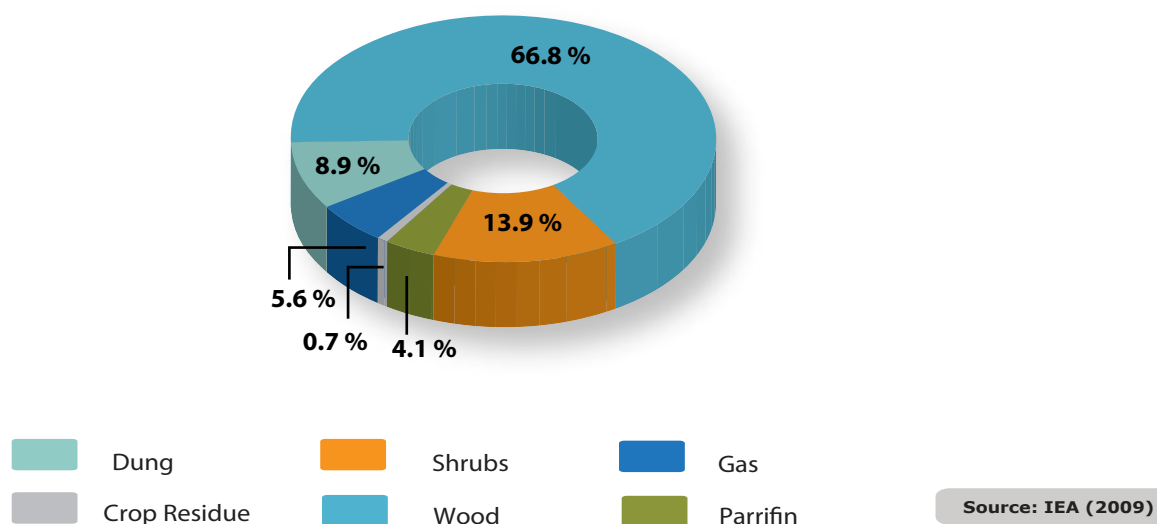
5. ENERGY AND BIOENERGY

5.1 ENERGY SUPPLY AND DEMAND

Approximately 24 percent of the country has access to electricity⁵. The majority of electrified households live in urban areas, while only 1 percent of rural households have access to electricity⁸.

Biomass (including wood, shrubs, dung and crop residues) is the main energy source in Lesotho, providing around 90% of energy used in households (Figure 7). Gas and paraffin account for the remaining 10 percent⁸. Other potential renewable energy options include modern bioenergy, solar energy, wind energy, and further development of hydropower⁸.

FIGURE 7: LESOTHO HOUSEHOLD ENERGY SOURCES (2007)



5.2 MODERN BIOENERGY

As of May 2010, there was no significant production of modern bioenergy in Lesotho⁹. However, biogas digesters have been established in both urban and rural settings⁵.

Further assessment is needed in order to adequately understand the potential role of bioenergy within Botswana's energy mix.

5.3 POLICY

The *Energy Policy*, which builds upon the *Lesotho Energy Masterplan (LEMP)* created in the 1990's, provides the main framework for energy development in the country. According to this policy, "energy shall be universally accessible and affordable in a sustainable matter, with minimal negative impact on the environment¹⁰." In order to achieve this overall goal, the following specific objectives are outlined within the *Energy Policy*: to contribute towards the improvement of livelihoods; to contribute towards economic growth and investment; to ensure supply security; and to contribute towards environmental protection¹⁰.

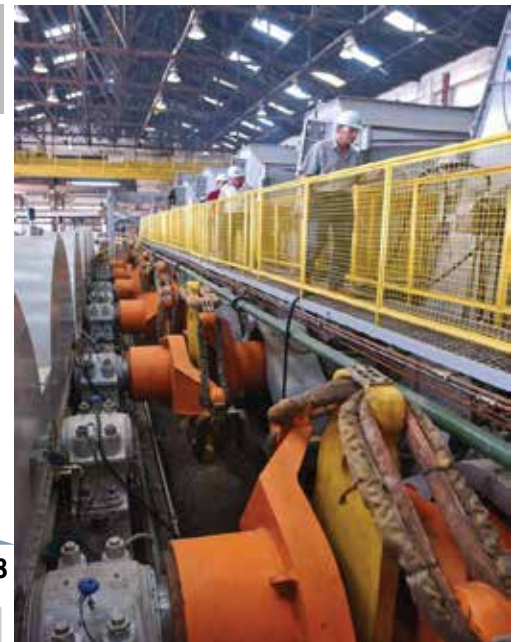
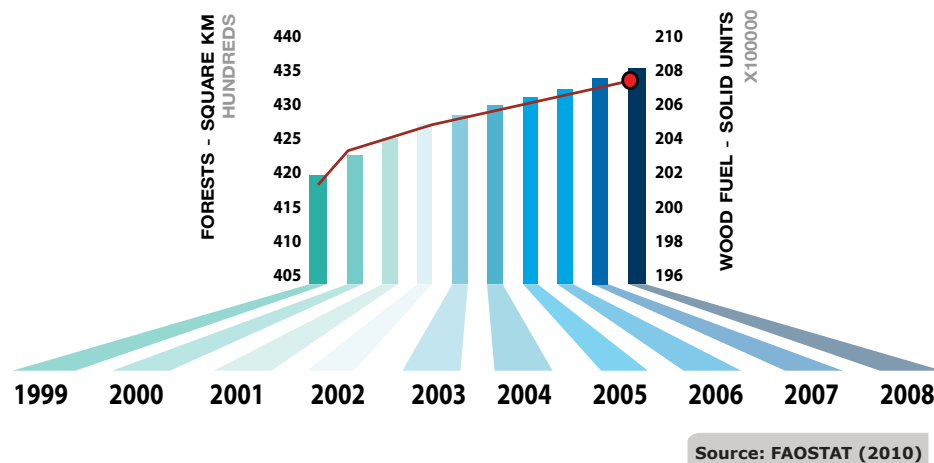
6. ENVIRONMENTAL CONCERNS

6.1 CLIMATE CHANGE

Because of its unique geography, Lesotho is susceptible to potential changes in rainfall patterns, decreases in fresh water reserves, and increasing aridity¹¹. These potential changes could have major impacts on the agricultural sector.

Deforestation is not currently a concern for Lesotho. As noted previously, forestry and forest products are heavily utilized as a household energy source, with over 68 percent of household energy coming from biomass. At present, the data shows that forested areas are increasing, as are levels of wood fuel production¹² (Figure 8).

FIGURE 8: LESOTHO FOREST AREA VS. WOOD FUEL PRODUCTION (1999-2008)



6.2 POLICY

The *National Environmental Policy*, which was last amended in 1998, has the overall goal of achieving sustainable livelihoods and development in Lesotho¹³. In order to achieve this goal, a number of specific objectives are outlined within this policy. These objectives are: promoting environmental awareness and understanding; practicing natural resource conservation; encouraging environmental management participation; halting environmental degradation; restoring, maintaining, and enhancing ecosystems; fostering community management, environmental regulations, accountability systems, and dissemination of information; promoting sustainable land use; empowering women in natural resource and management activities; and cooperating with other countries and the international community to minimize environmental impacts¹³.



SUMMARY

- Lesotho's agricultural sector employs around 60 percent of its total labor force and accounts for 8 percent of the country's GDP.
- Out of Lesotho's total land area, 77 percent is used for agricultural purposes, with 11 percent of this area classified as arable land. Around 1.6 percent of the country's renewable water resources is withdrawn annually.
- Maize, wheat, and potatoes contribute 73 percent to the average daily calorie intake, with maize alone providing 55 percent of the latter. Animal products account for 6 percent of the calorie intake.
- Lesotho is classified as an LIFDC. In 2009, the country imported 84.5 percent of the total domestic maize consumption, 92.9 percent of the total domestic wheat consumption, and 100 percent of sugar consumption. Potential increases in the price of these commodities on the international market can thus affect the trade balance, as well as the welfare of net consuming households.
- Around 24 percent of households have access to electricity. Biomass provides around 90% of energy used in households.
- At present, there is no significant production of modern bioenergy in Lesotho. However, biogas digesters have been established in both urban and rural settings. Further assessment is needed in order to adequately understand the potential role of bioenergy within Lesotho's energy mix.
- Over the last ten years, Lesotho has implemented a range of policies affecting the agricultural, energy, and environmental sectors. The development of better data on the topics covered in this brief will strengthen the government's ability to assess the effectiveness of these policy interventions and improve future decisions regarding food security and energy sector development in Lesotho.

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