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Technical analysis of the first biennial update report of Lesotho submitted on 9 November 2021

Summary report by the team of technical experts

Summary

According to decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention, consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report by December 2014. As mandated, the least developed country Parties and small island developing States may submit biennial update reports at their discretion. This summary report presents the results of the technical analysis of the first biennial update report of Lesotho, conducted by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
AFOLU	agriculture, forestry and other land use
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CGE	Consultative Group of Experts
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
GEF	Global Environment Facility
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
HWP	harvested wood products
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N_2O	nitrous oxide
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NIR	national inventory report
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
SF_6	sulfur hexafluoride
TTE	team of technical experts
UNFCCC guidelines for the preparation of NCs from non-Annex I Parties	"Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention"
UNFCCC reporting guidelines on BURs	"UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention"

I. Introduction and process overview

A. Introduction

1. The process of ICA consists of two steps: a technical analysis of the submitted BUR and a facilitative sharing of views under the Subsidiary Body for Implementation, resulting in a summary report and a record, respectively.

2. According to decision 2/CP.17, paragraph 41(a), non-Annex I Parties, consistently with their capabilities and the level of support provided for reporting, were to submit their first BUR by December 2014. The least developed countries and small island developing States may submit at their discretion.

3. Further, according to paragraph 58(a) of the same decision, the first round of ICA is to commence for non-Annex I Parties within six months of the submission of the Parties' first BUR. The frequency of developing country Parties' participation in subsequent rounds of ICA, depending on their respective capabilities and national circumstances, and the special flexibility for small island developing States and the least developed country Parties, will be determined by the frequency of the submission of BURs.

4. This summary report presents the results of the technical analysis of the first BUR of Lesotho, undertaken by a TTE in accordance with the provisions on the composition, modalities and procedures of the TTE under ICA contained in the annex to decision 20/CP.19.

B. Process overview

5. In accordance with the mandate referred to in paragraph 2 above, Lesotho submitted its first BUR on 9 November 2021 as a stand-alone update report.

6. During the technical analysis, the Party clarified that it could not submit its first BUR by December 2014 because it experienced challenges in accessing financial support, which only became available in 2016, and in recruiting consultants for the preparation of its BUR.

7. A desk analysis of Lesotho's BUR was conducted remotely from 4 to 8 April 2022 and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Buket Akay (Türkiye), Michinobu Aoyama (member of the CGE from Japan), Fernando Farias (former member of the CGE from Chile), Kokou Jérémie Fontodji (Togo), Yamikani Idriss (Malawi), Lawrence Mashungu (Zimbabwe), Jorge Eduardo Morfín Ríos (Mexico), Dalia Adel Nakhla (Egypt), Lilian Portillo (former member of the CGE from Paraguay), Tigran Sekoyan (Armenia), Dingane Sithole (Zimbabwe) and Ridhima Sud (India). Michinobu Aoyama and Lilian Portillo were the co-leads. The technical analysis was coordinated by Amr Abdel-Aziz and Sohel Pasha (secretariat).

8. During the technical analysis, in addition to the written exchange, in the virtual team room, to provide technical clarifications on the information reported in the BUR, the TTE and Lesotho engaged in consultation[1] on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Lesotho's first BUR, the TTE prepared and shared a draft summary report with Lesotho on 17 October 2022 for its review and comment. Lesotho, in turn, provided its feedback on the draft summary report on 19 December 2022.

9. The TTE finalized the summary report in consultation with the Party on 19 December 2022.

[1] The consultation was conducted via videoconferencing.

II. Technical analysis of the biennial update report

A. Scope of the technical analysis

10. The scope of the technical analysis is outlined in decision 20/CP.19, annex, paragraph 15, according to which the technical analysis aims to, without engaging in a discussion on the appropriateness of the actions, increase the transparency of mitigation actions and their effects and shall entail the following:

(a) The identification of the extent to which the elements of information listed in paragraph 3(a) of the ICA modalities and guidelines (decision 2/CP.17, annex IV) have been included in the BUR of the Party concerned (see chap. II.B below);

(b) A technical analysis of the information reported in the BUR, specified in the UNFCCC reporting guidelines on BURs (decision 2/CP.17, annex III), and any additional technical information provided by the Party concerned (see chap. II.C below);

(c) The identification, in consultation with the Party concerned, of capacity-building needs related to the facilitation of reporting in accordance with the UNFCCC reporting guidelines on BURs and to participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention (see chap. II.D below).

11. The remainder of this chapter presents the results of each of the three parts of the technical analysis of Lesotho's BUR outlined in paragraph 10 above.

B. Extent of the information reported

12. The elements of information referred to in paragraph 10(a) above include the national GHG inventory report; information on mitigation actions, including a description of such actions, an analysis of their impacts and the associated methodologies and assumptions, and information on progress in their implementation; information on domestic MRV; and information on support needed and received.

13. According to decision 20/CP.19, annex, paragraph 15(a), in undertaking the technical analysis of the submitted BUR, the TTE is to identify the extent to which the elements of information listed in paragraph 12 above have been included in the BUR of the Party concerned. The TTE considers that the reported information is mostly consistent with the UNFCCC reporting guidelines on BURs. Specific details on the extent of the information reported for each of the required elements are provided in the tables included in annex I.

C. Technical analysis of the information reported

14. The technical analysis referred to in paragraph 10(b) above aims to increase the transparency of information reported by the Parties on mitigation actions and their effects, without engaging in a discussion on the appropriateness of those actions. Accordingly, the focus of the technical analysis was on the transparency of the information reported in the BUR.

15. For information reported on national GHG inventories, the technical analysis also focused on the consistency of the methods used for preparing those inventories with the appropriate methods developed by the IPCC and referred to in the UNFCCC reporting guidelines on BURs.

16. The results of the technical analysis are presented in the remainder of this chapter.

1. Information on national circumstances and institutional arrangements relevant to the preparation of national communications on a continuous basis

17. As per the scope defined in paragraph 2 of the UNFCCC reporting guidelines on BURs, the BUR should provide an update to the information contained in the most recently

submitted NC, including information on national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis. In their NCs, non-Annex I Parties report on their national circumstances following the reporting guidance contained in decision 17/CP.8, annex, paragraphs 3–5, and they could report similar information in their BUR, which is an update of their most recently submitted NC.

18. Lesotho reported in its first BUR information on its national circumstances, including a description of national development priorities, objectives and circumstances, including features of geography, population, economic sectors and climate that might affect the Party's ability to deal with mitigating and adapting to climate change, as well as information regarding national circumstances and constraints on the specific needs and concerns arising from the adverse effects of climate change and/or the impact of the implementation of response measures, as referred to in Article 4, paragraph 8, and, as appropriate, Article 4, paragraphs 9–10, of the Convention. Lesotho also reported on its development policies in place.

19. Lesotho transparently reported in its first BUR information on its existing institutional arrangements relevant to the preparation of its NCs and BURs on a continuous basis. The description covers key aspects of the institutional arrangements, including the legal status and roles and responsibilities of the overall coordinating entity, which is the Ministry of Energy and Meteorology, and the involvement and roles of other institutions and experts. The TTE noted planned improvements to the information reported in the BUR, including enhancement of the tracking of GHG emissions, mitigation and adaptation actions, and climate finance flows through a new proposed MRV system (see para. 22 below).

20. In addition, Lesotho provided a summary of relevant information regarding its national circumstances in tabular format.

21. Information on the formal agreement among line ministries and on operational guidelines and tools related to institutional arrangements for the development of BURs was not reported in Lesotho's BUR and the reasons for this was not clear to the TTE. However, the Party clarified in its BUR that these issues will be addressed through the planned establishment of an MRV system under which institutional, regulatory, technical and sectoral bodies at multiple levels of government will be created. During the technical analysis, the Party further clarified that it has submitted a funding request for the system to the Capacity-building Initiative for Transparency.

22. Lesotho reported in its first BUR information on its proposed domestic MRV arrangements, the aim of which is to enhance the tracking of GHG emissions, the impacts of mitigation and adaptation actions, and international, regional and domestic climate finance flows. The description covers key aspects of the institutional arrangements, including key institutions; the roles and responsibilities of relevant institutions in each sector, as well as of the national climate change committee; the format and frequency of monitoring and reporting; data collection, processing and internal QA/QC procedures; and data storage and archiving. The MRV arrangements are designed at the national level and cover three main areas: the national GHG inventory (sectors, activities and gases), adaptation and mitigation measures (sectors, impacts and tracking methodologies) and support needed and received (technical and financial). The Party plans to enhance its MRV arrangements by building on the existing ad hoc systems, processes and infrastructure, rendering them cost-effective.

2. National greenhouse gas emissions by sources and removals by sinks

23. As indicated in table I.1, Lesotho reported information on its GHG inventory in its BUR partially in accordance with paragraphs 3–10 of the UNFCCC reporting guidelines on BURs and paragraphs 8–24 of the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties, contained in the annex to decision 17/CP.8.

24. Lesotho submitted its first BUR in 2021 and the GHG inventory reported is for 2011–2017. The GHG inventory is consistent with the requirements for the reporting time frame.

25. GHG emissions and removals for the BUR covering the 2011–2017 inventories were estimated using the tier 1 methodology from the 2006 IPCC Guidelines. The TTE commends the Party for using these guidelines.

26. Information on AD and EFs used and their sources was clearly reported in the BUR.

27. Information on the Party's total GHG emissions by gas for 2011–2017 is outlined in table 1 in Gg CO_2 eq. It shows an increase in emissions of 3.3 per cent without land and HWP since 2011 (4,423.61 Gg CO_2 eq).

Table 1
Greenhouse gas emissions by gas of Lesotho for 2011–2017

Gas	*GHG emissions (Gg CO_2 eq) including land and HWP*[a]	*% change 2011–2017*	*GHG emissions (Gg CO_2 eq) excluding land and HWP*[a]	*% change 2011–2017*
CO_2	3 535.57	3.9	2 446.02	10.8
CH_4	1 381.38	–2.7	1 381.38	–2.7
N_2O	732.69	–7.4	732.69	–7.4
HFCs	10.82	209.1	10.82	209.1
PFCs	NO	NA	NO	NA
SF_6	NO	NA	NO	NA
Other	NE	NA	NE	NA
Total	**5 660.46**	**0.8**	**4 570.91**	**3.3**

[a] 2006 IPCC Guidelines AFOLU category 3.B (land) and, if reported, 3.D (HWP (3.D.1) and other emissions (3.D.2)).

28. Information on indirect GHG emissions was not reported.

29. Information on PFCs and SF_6 was not reported in Lesotho's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that there are no activities in the country that generate PFC or SF_6 emissions.

30. Lesotho applied notation keys in tables where numerical data were not provided. The use of notation keys was consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties.

31. Comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF and the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines was not reported in Lesotho's BUR and the reason for this was not clear to the TTE.

32. The shares of emissions that different sectors contributed to the Party's total GHG emissions excluding land (category 3.B), as calculated by the TTE using information from the BUR, in 2017 are reflected in table 2.

Table 2
Shares of greenhouse gas emissions by sector of Lesotho for 2011–2017

Sector	*GHG emissions (Gg CO_2 eq)*	*% share*[a]	*% change 2011–2017*
Energy	2 861.17	62.60	10.70
IPPU	11.91	0.30	130.50
AFOLU	2 416.97	NA	–10.20
Livestock (category 3.A)	757.60	16.60	–11.02
Land (category 3.B)	1 089.55	NA	–8.70
Aggregate sources and non-CO_2 emissions sources on land (category 3.C)	569.82	12.50	–11.70
Waste	370.40	8.00	9.60

[a] Share of total without 2006 IPCC Guidelines AFOLU category 3.B (land) and, if reported, 3.D (HWP (3.D.1) and other emissions (3.D.2)).

33. Lesotho reported information on its use of GWP values consistent with those provided by the IPCC in its AR2 based on the effects over a 100-year time-horizon of GHGs.

34. For the energy sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys used and

other aspects specific to the sector. The residential category is the largest contributor to Lesotho's energy sector emissions, accounting for and 69.7 and 65.3 per cent in 2013 and 2016 respectively. Civil aviation is the smallest contributor, accounting for 0.006 and 0.033 per cent in 2011 and 2017 respectively.

35. The only primary AD used for the energy sector were annual liquid fuel consumption. Statistics on solid fuel consumption in Lesotho were not reported in the BUR. These values were extrapolated by the Party using linear regression from the 2005–2010 consumption values estimated for the third GHG inventory.

36. For the IPPU sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys used and other aspects specific to the sector. In Lesotho, the main industrial activity that results in industrial process emissions is the production of ceramics, while the use and disposal of refrigeration and stationery air-conditioning equipment is the main source of GHG emissions from product use. The AD over the time series are a combination of actual production data and production estimates based on plant capacity, which affects the consistency of the emission estimates reported by the Party.

37. Information on GHG emissions from cement production was not reported in Lesotho's BUR. However, the Party provided relevant clarification in its BUR, namely, that this source category was excluded owing to the unavailability of AD.

38. For 2006 IPCC Guidelines AFOLU categories 3.A and 3.C, agricultural soils (N_2O), enteric fermentation (CH_4), animal waste management systems (N_2O), biomass burning (CH_4 and N_2O) and indirect emissions from agricultural soils (N_2O) were identified as key categories and the most relevant emissions sources in the sector. Category 3.C.2 (liming) was excluded from the AFOLU sector inventory as data on lime consumption were not sufficient for its inclusion. Information was reported on the number of livestock and burned areas but not on the amounts of fertilizers used.

39. For land (category 3.B), Lesotho reported annual GHG emissions and removals for 2011–2017. The land category is the largest contributor to AFOLU sector emissions, followed by the livestock category (3.A). Enteric fermentation is the largest contributor to emissions for the livestock category, contributing an average of 88.8 per cent annually between 2011 and 2017.

40. For the waste sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys used and other aspects specific to the sector. The largest contributor to waste sector emissions is the disposal of solid waste, estimated at 63.2 and 63.9 per cent in 2011 and 2017 respectively. Incineration and open burning of waste is the smallest contributor to sectoral GHG emissions, with an average annual contribution of 16.7 per cent over the time series (2011–2017). The largest uncertainty for the solid waste disposal on land category was in the AD; because there are no national statistics on solid waste, demographic statistics were used.

41. The BUR includes the GHG inventories reported in the Party's previous NCs. Lesotho's first national GHG inventory (NC1) was compiled in 2000 for 1994, while the second (NC2) was compiled in 2013 for 2000. Both inventories were based on the Revised 1996 IPCC Guidelines. Lesotho's third national GHG inventory (NC3) was compiled in 2018 and covered 2005–2010. The Party reported that it did not perform recalculations for 1994 and 2000 owing to the unavailability of data sets for those years. The GHG inventories for 2005–2017 reported in the BUR are consistent.

42. Information on emissions in 2000–2005 was not clearly reported in Lesotho's BUR. During the technical analysis, the Party clarified that the information reported in its BUR was from previous NCs, which covered years from 2005 onward, and that it plans to estimate emissions for 2000–2005 for inclusion in future BURs.

43. Lesotho described in its BUR the institutional framework for the preparation of its 2011–2017 GHG inventory. The Party reported that the Ministry of Energy and Meteorology, through Lesotho Meteorological Services, is the governmental body responsible for its climate change policy and GHG inventory. The Party identified required improvements to its reporting, such as in the accuracy of energy statistics, the consistency of data over the entire

time series for the IPPU sector and the accuracy of estimates for waste generation and disposal and wastewater flows.

44. Lesotho clearly reported that a key category analysis was performed for the level of emissions. The analysis was performed using the tier 1 methodology, for 2010. The key categories with the highest level of emissions included residential fuel combustion (1.A.4.b), enteric fermentation (3.A.1), direct emissions from agricultural soils (3.C.4) and commercial/institutional fuel combustion (1.A.4.a).

45. The BUR provides information on QA/QC measures for all sectors, including the entity responsible for each sector. The Party identified improvements in its reporting such as strengthened QA/QC procedures for energy data management by different entities, especially with regard to fertilizer, urea and lime consumption data. The TTE commends the Party for reporting such information.

46. Lesotho clearly reported information on CO_2 fuel combustion emissions using both the sectoral and the reference approach. The information reported indicates that the combustion emissions estimated under the reference and the sectoral approach for 2011 are 2,208 and 2,584 Gg CO_2 eq respectively. For 2017, they are 2,439 Gg CO_2 eq and 2,861 Gg CO_2 eq respectively.

47. The difference between the estimates calculated using the two approaches was not reported in Lesotho's BUR. During the technical analysis, the Party clarified that it omitted the explanation of this difference in the BUR.

48. Information on international aviation and marine bunker fuels was not clearly reported in Lesotho's BUR. During the technical analysis, the Party clarified that emissions from those activities do not occur in the country because fuelling of Lesotho's aircraft and ships takes place in South Africa.

49. Information on the overall level of and trend in uncertainty of the national GHG inventory was not reported in Lesotho's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that its QA/QC team requires more technical capacity to make the relevant calculations.

50. The TTE noted that the transparency of the information reported on GHG inventories could be enhanced by addressing the areas noted in paragraphs 28, 29, 31, 35, 37, 41, 42, 47 and 49 above, which could facilitate a better understanding of the information reported on GHG inventories.

3. Mitigation actions and their effects, including associated methodologies and assumptions

51. As indicated in table I.2, Lesotho reported in its BUR, partially in accordance with paragraphs 11–13 of the UNFCCC reporting guidelines on BURs, information on mitigation actions and their effects, to the extent possible.

52. The information reported provides a comprehensive overview of the Party's mitigation actions and their effects. In its BUR, Lesotho reported information on its national context and framed its national mitigation planning and actions in the context of a series of legislative, regulatory and institutional initiatives, including policies, strategies, plans and programmes for advancing low-carbon development in the context of sustainable development and poverty eradication. The National Strategic Development Plan for 2018–2019 identifies climate change as one of the key challenges hindering Lesotho's development. Regarding mitigation, the Party's NDC, National Climate Change Policy for 2017–2027 and 2019 National Climate Change Policy Implementation Strategy focus on facilitating the transition to low-carbon development pathways. In its NDC, Lesotho includes the unconditional target of lowering its net GHG emissions by 10 per cent by 2030 relative to 'business as usual' emissions of 5,713 t Mt CO_2 eq, rising to 35 per cent on the condition that external support (financing, investment, technology development and transfer, and capacity-building) is made available to cover all needs relating to implementing additional adaptation and mitigation actions. In its BUR, Lesotho reported that challenges related to climate change should be responded to in a strategic manner, using approaches appropriate to the national

circumstances and recognizing the country's need to promote a green economy during its development.

53. Most of the mitigation actions implemented or under implementation by Lesotho are in the energy sector, including five actions implemented in the areas of renewable energy, energy efficiency and biogas technology. Mitigation actions were also presented in the AFOLU (two actions) and waste sectors (one action). The implemented mitigation actions contributed to estimated emission reductions of 167,544 t CO_2 eq from 2005 to 2018, with the energy sector being the main source of emission reductions (86.0 per cent or 144,101 t CO_2 eq). The Party reported information on the implementation of policies and strategies in the energy and AFOLU sectors but did not report the results achieved. Lesotho also reported on the development of five NAMAs aimed at scaling up existing mitigation efforts and accelerating GHG emission reductions. If all NAMAs are fully implemented and sustained, the anticipated minimum GHG emission reduction is expected to be 360,638 t CO_2 eq per year. However, the Party indicated during the technical analysis that its NAMAs are not yet at implementation stage.

54. The Party reported a summary of its sectoral mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11. The Party also reported information on its mitigation actions in narrative format.

55. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Lesotho clearly reported the names of mitigation actions or groups of actions and coverage (sector and gases) in the BUR (tables 3-2, 3-3 and 4–9). Quantitative goals and progress indicators were provided for all five NAMAs and other projects presented in the BUR. A description of mitigation actions was provided in the BUR.

56. Quantitative goals and progress indicators were not reported for the energy policies and the energy strategy. During the technical analysis, the Party clarified that this information is not available, and that capacity-building is needed to develop quantitative goals and progress indicators for polices and strategies.

57. In the energy sector, the mitigation actions focus mainly on improving energy efficiency and promoting use of renewable energy and biogas technology and were reported as implemented and ongoing. The Party reported information on the objectives of the actions, steps taken or envisaged to achieve them and progress of implementation for the five implemented actions in this sector. The results achieved were reported in the form of estimated emission reductions and laid the foundation for the development of three NAMAs (pertaining to use of biogas by public institutions, scaled-up dissemination of efficient cookstoves and development of solar technologies), the results of which were presented as estimated outcomes. Associated mitigation co-benefits (economic, social and environmental) were also reported. The most effective action in terms of cumulative GHG emission reductions aims to promote the use of efficient fuelwood cookstoves in households in several areas of Lesotho that previously used traditional fireplaces, which are inefficient. Between 2012 and 2017, this action mitigated emissions totalling 124,458 t CO_2 eq.

58. The mitigation actions in the AFOLU sector focus on forestry practices and increasing land cover through tree planting and were reported as ongoing. The Party also reported a NAMA, the National (Re)Forestation Programme, which will build on the results of the implemented actions and is planned for future implementation. The Party reported information on the objectives of the action National Tree Planting Initiative (Forest Trees) and its progress of implementation. For the Forestry Policy 2008, which Lesotho reported as a completed mitigation action, no objectives were included in the BUR, but an objective was provided by the Party during the technical analysis. The results achieved and expected were included in the form of estimated emission reductions. The tree planting mitigation action, managed by the Ministry of Forestry, Range and Soil Conservation, mitigated emissions totalling 23,443 t CO_2 eq between 2005 and 2018, while the NAMA is aimed at preventing emissions totalling 126,460 t CO_2 eq annually and brings multiple co-benefits, including job creation, enhancement of biodiversity and land rehabilitation.

59. In the waste sector, the mitigation actions relate to determining a baseline for developing an integrated solid waste management system for Maseru (Lesotho's capital city) and reducing the quantity of solid waste at three landfill sites through separation at source,

diversion of recyclables and generation of energy from non-recyclables. The Party reported information on the methodologies and objectives of the action related to determining a baseline, as well as steps taken or envisaged and progress of implementation. Lesotho described the objectives and steps envisaged for the NAMA, and its estimated results were included in the form of estimated emission reductions. The anticipated annual reduction of GHG emissions due to these actions is 83,049 t CO_2 eq.

60. Information on methodologies and assumptions, progress of implementation of mitigation actions, and the underlying steps taken or envisaged was not reported for some of the actions. During the technical analysis, Lesotho shared information on the methodologies and assumptions underlying the NAMAs, but clarified that it is unable to provide any of the missing information for the other mitigation actions because of a lack of robust methodologies for assessing them, pointing out a need for capacity-building in this regard.

61. Lesotho provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. Lesotho documented one verified project under the UNFCCC clean development mechanism process (on efficient fuelwood cookstoves; see BUR table 3-2), including information on the sector covered and quantity of cumulative emission reductions issued as a result.

62. Lesotho reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that Lesotho is in the process of developing a comprehensive domestic MRV system, subject to obtaining funding, for addressing gaps in tracking mitigation actions. Lesotho outlined the main elements expected to be included in its MRV system, including institutional arrangements, criteria for defining indicators and a database.

63. The TTE noted that the transparency of the information reported on mitigation actions could be enhanced by addressing the areas noted in paragraphs 53, 56, 58 and 60 above, which could facilitate a better understanding of the information reported on mitigation actions.

4. Constraints and gaps, and related technology, financial, technical and capacity-building needs, including a description of support needed and received

64. As indicated in table I.3, Lesotho reported in its BUR, mostly in accordance with paragraphs 14–16 of the UNFCCC reporting guidelines on BURs, information on finance, technology and capacity-building needs and support received.

65. Lesotho clearly reported information on constraints and gaps, and related financial, technical and capacity-building needs in accordance with decision 2/CP.17, annex III, paragraph 14. In its BUR, Lesotho identified limited access to financial resources and technologies, low public investment, lack of private sector participation, lack of a proper mechanism for tracking information on financial resources, and lack of technical knowledge of climate finance data management as constraints. Lesotho reported that its financial, technical and capacity-building needs are primarily in the areas of improving the accuracy of AD, collecting data on existing refrigerators and air-conditioning units, building expertise in using the 2006 IPCC Guidelines, developing country-specific EFs, improving data collection on waste, improving the land monitoring system, monitoring and tracking mitigation actions and effects, promoting smart agriculture and strengthening the existing MRV system.

66. Lesotho reported information on financial resources, technology transfer, capacity-building and technical support received in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, Lesotho reported that it received financial support from the Least Developed Countries Fund, the GEF, the International Fund for Agricultural Development, the United Nations Economic Commission for Africa and the African Development Bank, as well as Japan and the United States of America, for adaptation measures (multisectoral and specific to the agriculture sector) and mitigation measures (for the energy sector). In its BUR, Lesotho reported that it received USD 351,000 from the GEF for preparing its first BUR.

67. Lesotho reported information on nationally determined technology needs with regard to the development and transfer of technology in accordance with decision 2/CP.17, annex III, paragraph 16. In its BUR, Lesotho reported that the technology needs assessment was nationally determined. Technology transfer support is needed for, for example, measuring

sanitary and industrial sewer flows and promoting the adoption of green technologies in manufacturing industries. Technology support has been received for projects such as distribution of household solar photovoltaic systems in rural areas to promote the use of renewable energy, distribution of cookstoves to reduce emissions from the unsustainable use of wood, and installation of grid-connected photovoltaic systems to enhance power generation capacity.

D. Identification of capacity-building needs

68. In consultation with Lesotho, the TTE identified the following needs for capacity-building that could facilitate the preparation of subsequent BURs and participation in ICA:

(a) Calculating combined uncertainties from the different sectors;

(b) Developing a country-specific burned area detection system (e.g. using fire scar maps or ground data collection);

(c) Developing country-specific AD on land use, land-use change and forest, including maps, to enhance completeness, and developing sampling methods to validate such maps;

(d) Strengthening institutional arrangements and capacity-building to facilitate the accurate collection and tracking of information on financial resources for implementing climate actions;

(e) Facilitating access to and/or mobilization of financial support, such as by creating a domestic enabling environment and addressing human resource constraints;

(f) Improving AD for all sectors across the time series, such as vehicle statistics, fossil fuel consumption data, HFC sources and waste generation rates;

(g) Identifying, applying and reporting on methodologies for estimating mitigation impacts from NAMAs and facilitating interpretation of the results achieved in specific sectors through training and other capacity-building tools;

(h) Enhancing the capacity of all institutions and staff to implement the proposed MRV system for mitigation;

(i) Defining and estimating domestic GHG emission baseline scenarios and projections for sectoral mitigation policies and measures in the country, including NAMAs.

69. The TTE noted that, in addition to those identified during the technical analysis, Lesotho reported the following capacity-building needs in its BUR, which include capacity-building needs for future BURs:

(a) Strengthening national capacity to prepare the GHG inventory and the NIR for the purpose of the BUR;

(b) Strengthening institutional and human capacity to fulfil obligations under the Convention;

(c) Enhancing national capacity to establish a systematic and continuous approach to raising public awareness on climate change;

(d) Defining, estimating and tracking domestic GHG emissions in order to determine the effectiveness of sectoral mitigation policies and measures.

III. Conclusions

70. The TTE conducted a technical analysis of the information reported in the first BUR of Lesotho in accordance with the UNFCCC reporting guidelines on BURs and concludes that the information reported is mostly consistent. It provides an overview of national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis; the national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol; mitigation actions and their

effects; constraints and gaps, and related financial, technical and capacity-building needs, including a description of support needed and received; the level of support received to enable the preparation and submission of BURs; and domestic MRV. During the technical analysis, additional information was provided by Lesotho on the NIR and mitigation actions. The TTE concluded that the information analysed is mostly transparent.

71. Lesotho reported information on the institutional arrangements relevant to the preparation of its BURs, including the legal status and roles and responsibilities of the overall coordinating entity, which is the Ministry of Energy and Meteorology, as well as the involvement and roles of other institutions and experts. The Party has taken significant steps to establish institutional arrangements that enable sustainable preparation of its BURs, such as making organizational improvements and establishing knowledge-sharing procedures to facilitate sectoral information transfer.

72. In its first BUR, submitted in 2021, Lesotho reported information on its national GHG inventory for 2011–2017. This included GHG emissions and removals of CO_2, CH_4, N_2O and HFCs for all relevant sources and sinks. The inventory was developed on the basis of the 2006 IPCC Guidelines. The total GHG emissions for 2017 were reported as 4,570.91 Gg CO_2 eq (excluding LULUCF) and 5,660.46 Gg CO_2 eq (including LULUCF). Twelve key categories and main gases were identified, with CO_2 from residential fuel combustion being the largest contributor to total emissions, followed by CO_2 from forest land. Estimates of PFC and SF_6 emissions were not provided because there are no activities in the country that generate these emissions, as clarified by the Party during the technical analysis.

73. Lesotho reported information on mitigation actions and their effects in both tabular and narrative format, including policies, sectoral strategies, programmes, and ongoing and completed projects in the energy, AFOLU and waste sectors. In addition, Lesotho presented five NAMAs for future implementation; these NAMAs build on existing policies, strategies and projects and have the aim of scaling up existing actions and accelerating GHG emission reduction. The Party reported planned, implemented, ongoing and/or completed actions in the energy, AFOLU and waste sectors. The mitigation actions focus on promoting use of renewable energy, enhancing energy efficiency, increasing afforestation and utilizing solid waste as an alternative fuel. The Party reported the progress of implementation of its mitigation actions and the results achieved, including emission reductions of 167,544 t CO_2 eq from 2005 to 2018 and estimated outcomes associated with the future implementation of five NAMAs equivalent to 360,638 t CO_2 eq annually. The highest emission reduction was reported for the energy sector of 144,101 t CO_2 eq between 2005 and 2018.

74. Lesotho reported the co-benefits of its mitigation actions, including social, environmental and economic co-benefits. The Party also reported information on its involvement in international market mechanisms and on MRV arrangements. Information on methodologies, assumptions, steps taken or envisaged, quantitative goals and progress indicators, and results was not provided for some of the mitigation actions in the BUR owing to the necessary information not being available, resulting in a need for capacity-building in this regard, as clarified by the Party during the technical analysis.

75. Lesotho reported information on key constraints, gaps and related needs, including limited access to financial resources and technologies, low public investment, lack of private participation, lack of a proper mechanism for tracking information on financial resources and lack of technical knowledge on climate finance data management. Information was reported on the capacity-building support received, including financial support from the Least Developed Countries Fund, the GEF, the International Fund for Agricultural Development, the United Nations Economic Commission for Africa and the African Development Bank, as well as Japan and the United States. Lesotho further reported information on the transfer of technology received. Information on the support received from the GEF for preparing the current BUR was reported in Lesotho's BUR.

76. The TTE, in consultation with Lesotho, identified the nine capacity-building needs listed in chapter II.D above and needs for capacity-building that aim to facilitate reporting in accordance with the UNFCCC reporting guidelines on BURs and participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention. Lesotho prioritized all the capacity-building needs.

Annex I

Extent of the information reported by Lesotho in its first biennial update report

Table I.1
Identification of the extent to which the elements of information on greenhouse gases are included in the first biennial update report of Lesotho

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and subsequent BURs shall cover a calendar year that does not precede the submission date by more than four years.	Yes	Lesotho submitted its first BUR in 2021; the GHG inventories reported are for 2011–2017.
Decision 2/CP.17, annex III, paragraph 4	Non-Annex I Parties should use the methodologies established in the latest UNFCCC guidelines for the preparation of NCs from non-Annex I Parties approved by the Conference of the Parties or those determined by any future decision of the Conference of the Parties on this matter.	Yes	Lesotho used the 2006 IPCC Guidelines.
Decision 2/CP.17, annex III, paragraph 5	The updates of the section on national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF; any change to the EF may be made in the subsequent full NC.	Yes	
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	(a) The tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;	No	Comparable information was not reported.
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	No	Comparable information was not reported.
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.	Partly	The BUR covers 2011–2017, while the NC1 covered 1994, the NC2 covered 2000 and the NC3 covered 2005–2010.
Decision 2/CP.17, annex III, paragraph 8	Non-Annex I Parties that have previously reported on their national GHG inventories contained in their NCs are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000).	Partly	Summary information tables were included for 2011–2017 but not for previous submission years (1994, 2000 and 2005–2010).
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of an NIR as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:	Yes	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors);	Yes	Comparable information was reported in appendix C to the BUR.
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6).	Partly	Information was reported on HFCs but not on PFCs or SF_6.
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	Yes	
Decision 17/CP.8, annex, paragraph 12	Non-Annex I Parties are also encouraged, to the extent possible, to undertake any key source analysis as indicated in the IPCC good practice guidance to assist in developing inventories that better reflect their national circumstances.	Yes	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved.	Yes	Information was reported on procedures and arrangements for data collection and archiving.
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of:		
	(a) CO_2;	Partly	
	(b) CH_4;	Partly	
	(c) N_2O.	Partly	
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:		
	(a) HFCs;	Yes	
	(b) PFCs;	No	Information on PFCs was not reported.
	(c) SF_6.	No	Information on SF_6 was not reported.
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs, such as:		
	(a) Carbon monoxide;	No	
	(b) Nitrogen oxides;	No	
	(c) Non-methane volatile organic compounds.	No	
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as sulfur oxides, and included in the Revised 1996 IPCC Guidelines may be included at the discretion of Parties.	No	
Decision 17/CP.8, annex, paragraph 18	Non-Annex I Parties are encouraged, to the extent possible, and if disaggregated data are available, to estimate and report CO_2 fuel combustion emissions using both the sectoral and the reference approach	Partly	The information was reported for both the sectoral and the reference approach but an

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	and to explain any large differences between the two approaches.		explanation for the difference in emissions was not provided.
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	(a) International aviation;	No	
	(b) Marine bunker fuels.	No	
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO_2 eq should use the GWP provided by the IPCC in its AR2 based on the effects of GHGs over a 100-year time-horizon.	Yes	The Party used the GWP provided in the AR2.
Decision 17/CP.8, annex, paragraph 21	Non-Annex I Parties are encouraged to provide information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of EFs and AD. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, EFs and AD used in their estimation of emissions, as appropriate. Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building:		
	(a) Information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol;	Yes	
	(b) Explanation of the sources of EFs;	Yes	
	(c) Explanation of the sources of AD;	Yes	
	(d) If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	Yes	
	(i) Source and/or sink categories;		
	(ii) Methodologies;		
	(iii) EFs;		
	(iv) AD;		
	(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.	Yes	
Decision 17/CP.8, annex, paragraph 22	Each non-Annex I Party is encouraged to use tables 1–2 of the guidelines annexed to decision 17/CP.8 in reporting its national GHG inventory, taking into account the provisions established in paragraphs 14–17. In preparing those tables, Parties should strive to present information that is as complete as possible. Where numerical data are	Yes	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	not provided, Parties should use the notation keys as indicated.		
Decision 17/CP.8, annex, paragraph 24	Non-Annex I Parties are encouraged to provide information on the level of uncertainty associated with inventory data and their underlying assumptions, and to describe the methodologies used, if any, for estimating these uncertainties:		
	(a) Level of uncertainty associated with inventory data;	No	
	(b) Underlying assumptions;	Yes	
	(c) Methodologies used, if any, for estimating these uncertainties.	Yes	

Note: The parts of the UNFCCC reporting guidelines on BURs on reporting information on GHG emissions by sources and removals by sinks in BURs are contained in decision 2/CP.17, paras. 3–10 and 41(g). Further, as per para. 3 of those guidelines, non-Annex I Parties are to submit updates of their national GHG inventories in accordance with paras. 8–24 of the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties, contained in the annex to decision 17/CP.8. The scope of such updates should be consistent with the non-Annex I Party's capacity and time constraints and the availability of its data, as well as the level of support provided by developed country Parties for biennial update reporting.

Table I.2
Identification of the extent to which the elements of information on mitigation actions are included in the first biennial update report of Lesotho

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 11	Non-Annex I Parties should provide information, in tabular format, on actions to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol.	Yes	
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible:		
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Partly	Information on quantitative goals and progress indicators was reported for all five NAMAs and other projects reported in the BUR. However, for the energy policies and the energy strategy, neither quantitative goals nor progress indicators were reported.
	(b) Information on:		
	(i) Methodologies;	No	Information on methodologies was not reported in the BUR, except for the mitigation actions in the waste sector.
	(ii) Assumptions;	No	
	(c) Information on:		

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(i) Objectives of the action;	Partly	Information was not reported on the objectives of one action in the AFOLU sector.
	(ii) Steps taken or envisaged to achieve that action;	Partly	Information on steps taken or envisaged was not reported for some actions in the energy and AFOLU sectors.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Partly	The Party indicated during the technical analysis that implementation of the NAMAs reported in the BUR has not commenced.
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Partly	Lesotho did not provide information on the progress of implementation for some actions in energy, AFOLU and waste sectors.
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Partly	The Party reported the results, including estimated emission reductions, of implementing the energy and AFOLU sector projects and NAMAs, but did not report results achieved from the implementation of policies and strategies in the energy and AFOLU sectors.
	(e) Information on international market mechanisms.	Yes	
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on domestic MRV arrangements.	Yes	A description of the MRV system under development was provided in BUR chapter 4.

Note: The parts of the UNFCCC reporting guidelines on BURs on the reporting of information on mitigation actions in BURs are contained in decision 2/CP.17, annex III, paras. 11–13.

Table I.3
Identification of the extent to which the elements of information on finance, technology and capacity-building needs and support received are included in the first biennial update report of Lesotho

Decision	*Provision of the reporting requirements*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	Yes	
	(b) Related financial, technical and capacity-building needs.	Yes	Information on financial needs was reported.
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources received, technology transfer and capacity-building received;	Yes	Information on financial resources received, technology transfer and capacity-building received was reported in tabular format.

Decision	*Provision of the reporting requirements*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(b) Information on technical support received from the GEF, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR.	Yes	Information on technical support received was reported in tabular format.
Decision 2/CP.17, annex III, paragraph 16	With regard to the development and transfer of technology, non-Annex I Parties should provide information on:		
	(a) Nationally determined technology needs;	Yes	
	(b) Technology support received.	Yes	

Note: The parts of the UNFCCC reporting guidelines on BURs on the reporting of information on finance, technology and capacity-building needs and support received in BURs are contained in decision 2/CP.17, annex III, paras. 14–16.

Annex II

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency. Available at https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html.

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama, Japan: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/gp/english/.

IPCC. 2003. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. J Penman, M Gytarsky, T Hiraishi, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html.

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

B. UNFCCC documents

First BUR of Lesotho. Available at https://unfccc.int/BURs.

NC1, NC2 and NC3 of Lesotho. Available at https://unfccc.int/non-annex-I-NCs.