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1. Introduction and Background

The development of infrastructure in Africa is critical for fostering economic growth and improving the living standards of Africans. It contributes significantly to human development, poverty reduction, and the attainment of the Sustainable Development Goals (SDGs). Investment in infrastructure accounts for over half of the recent improvements in economic growth in Africa and has the potential to contribute even more.

It is for this reason that infrastructure development across Africa remains central to the African Development Bank's mission as espoused in its High 5s transformative agenda, covering the period 2015-2025.

As part of its infrastructure development efforts, the Bank launched the Africa Infrastructure Knowledge Program (AIKP) to improve the availability of statistical information on infrastructure development across Africa. The Bank also introduced an Africa Infrastructure Index (AIDI) to monitor the status and progress of infrastructure development across the continent. This brief presents the latest AIDI information on progress made by African

countries using data collected by the Bank under its AIKP. It also discusses the reasons behind the latest trends.

The present bulletin extends coverage to the period 2000–2018. The annual AIDI updates present selected indicators that comprise the Index's major components, namely: (i) electricity; (ii) transport; (iii) ICT; and (iv) water and sanitation.

The AIKP program aims to provide an effective and sustainable platform for data collection and analysis on Africa's infrastructure sectors. The Africa Infrastructure Development Index (AIDI) serves three key objectives, namely: (i) to monitor and evaluate the status and progress of infrastructure development across the continent; (ii) to assist in resource allocation within the framework of ADF replenishments; and (iii) to contribute to policy dialogue within the Bank and between the Bank, African countries and development partners.

It also aims to institutionalize infrastructure data collection in Africa by mainstreaming infrastructure statistics in the work programs of National Statistical Agencies. The program also generates

information on investment needs across countries and sectors, which are critical for informing private and public sector investment decisions, including Bank-managed support in African countries.

The AIDI's methodological basis, the background and rationale for its development, are expounded in Annex 3. A revision of the original methodology is currently underway as more data are collected under the auspices of AIKP.

2. The AIDI 2018 Highlights

An overall improvement in AIDI 2018 scores

In general, AIDI scores improved for virtually all countries between 2016 and 2018. The global index imputed for the entire continent has risen from 27.12 to 28.44. The range of performance for the top ten countries, including Seychelles, Egypt, Libya, South Africa, Mauritius, Tunisia, Morocco, Algeria, Cabo Verde and Botswana improved from 35.63-93.92 in 2016 to 36.79-94.32 in 2018 (Table 1.1 and Figure 1). However, the range of performance of the bottom ten countries remains almost unchanged. Generally, the progress is more evenly correlated with improvements in the sectoral indices of water and sanitation and ICT in the various countries. However, the improvement in the indices for the electricity and transport sectors is more pronounced in the top ten performing countries.

The top performers in terms of rankings

Over 2016 and 2018, 47 of 54 African countries improved on their AIDI, with the top ten performers achieving better growth than the others. Some countries made significant gains in their performance over the period 2016 to 2018. They include Libya, 3.62 points; Republic of Congo, 3.06 points; South Africa, 3.01 points; Gabon, 2.92 points; and Côte d'Ivoire, 2.90. The ranking of the top ten remains unchanged, with Seychelles retaining

the first position. Republic of Congo gained 7 positions (owing to fast electricity generation and ICT growth), followed by Ghana and Malawi (3 positions due to improvements in ICT and Water Supply and Sanitation), Angola, Côte d'Ivoire, and Ethiopia (2 positions each due to improvements in ICT, water supply and sanitation). The observed progress suggests that this group of countries is giving priority to investment in infrastructure in these sectors, which are critical to growing the economy.

The main losers in terms of rankings

Generally, the bottom ten performing countries made very marginal gains in their performance—less than one percent point on the average, except Ethiopia and Madagascar. It is important to note that most of the countries in this category are fragile states or/and emerging from conflict. Some countries recorded a decline in the overall performance index. They include Cabo Verde, 1.49; South Sudan, 0.34; and São Tomé and Príncipe, 0.24. In terms of ranking, Burkina Faso, Mauritania, Rwanda and Uganda saw the biggest drop, falling two positions.

Subregional rankings remain stable

The ranking of the five regions remain unchanged, with North Africa remaining in the first position, followed by Southern Africa, West Africa, East Africa and Central Africa. The best performing sub-region to emerge is Southern Africa, with an average of 2.0 points, followed by West Africa—1.55 points. The West African region recorded only 0.36 points—the lowest average in improvement.

ICT emerges as the main driver of AIDI improvements

The ICT sector has driven the most improvements in the AIDI ratings over the past decade, compared to all other sectors. It is no coincidence that the top ten countries in the latest AIDI were those with the highest growth in their ICT sectors.

According to the AfDB report “African Telecom Infrastructure Investment Needs, April 2015”, 2005-2010 was a period of very high growth for mobile telephony, marked by the emergence of new operators in the market, massive growth in coverage extensions, higher broadband speeds, as well as the increase in subscriptions. The period 2010-2015 also witnessed the development of new submarine and regional overland cables, which provided huge new capacity around coastal Africa, as well as facilitating mobile operator consolidation. This period also saw large investments by the private sector and the emergence of public-private partnerships (PPPs) in some countries, which has been a major factor behind the growth.

Over the next few decades, the mobile networks will need upgrading and modernization to support the shift to smartphones. The need for fiber broadband networks and the demand by both corporations, and the general public for superfast fiber access at national levels have emerged as urgent priorities to keep pace with global developments, and this will require major financial investment. It is anticipated that in the near to medium term, ICT will continue to lead the growth and improvement in infrastructure development, as captured by the AIDI scores.

Transport and power recorded slower growth

The transport and power sectors require a much higher level of investment to fuel their growth. Although these sectors are crucial components of the AIDI, their contribution to the rankings of African countries is much lower than that of the ICT sector. Progress has been made in

both sectors across the continent, but the rate of that growth has not been significant enough to affect individual country rankings in the AIDI.

Water supply and sanitation – disappointing progress for many countries

Many African countries have shown slower progress in water supply and sanitation, compared to developing countries in other regions of the world. Surprisingly, some countries that ranked in the top ten according to the AIDI scores still lack improved sanitation facilities, particularly in rural areas. In half of the African countries, less than 35 percent of the population have access to improved sanitation facilities, and less than 76 percent have access to portable water.

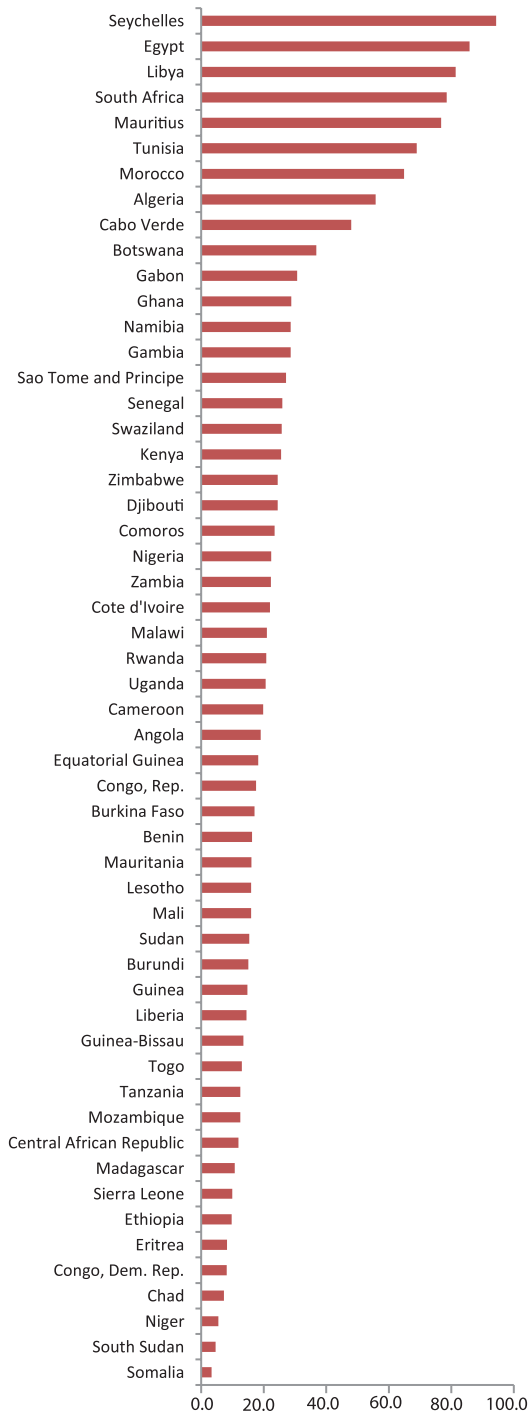
The progress made in sanitation is still well below the targets set by the UN's Sustainable Development Goals (SDGs). This needs to be addressed urgently, given the massive impact of this sector on the quality of life of Africans and its linkages to other sectors such as health—particularly in rural areas. Clearly, policies and investments targeting this sector are imperative to drive up overall AIDI scores and to achieve many of the SDGs.

3. Main Results

3.1. Country by country comparisons

The AIDI 2018 results are presented in the form of scores and rankings using data collected by the Bank for the period 2010-2015. In general, scores are improving for all African countries, but not enough to boost the rankings of many countries. Figure 1 shows the status of all African countries ranked according to the 2018 scores.

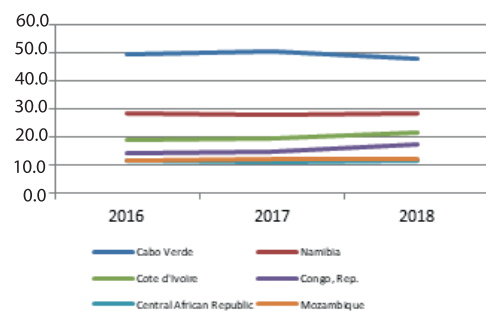
Figure 1: AIDI 2018, Country Scores



The AIDI 2018 shows that the top ten ranked countries remained the same as in the AIDI rankings in 2016, namely, Seychelles, Egypt, Libya, South Africa, Mauritius, Tunisia, Morocco, Algeria, Cabo Verde, and Botswana (cf. Table 1). Their specific ranking remains unchanged. These top ten countries are characterized principally by a robust investment performance in all sectors. Of these, five countries are in North Africa, and three are Small Island countries where tourism constitutes an important sector of their economies. They have therefore traditionally focused on improving infrastructure to attract visitors.

The bottom ten countries in the rankings are Central African Republic, Madagascar, Sierra Leone, Ethiopia, Eritrea, Democratic Republic of Congo, Chad, Niger, South Sudan, and Somalia. Mozambique has moved from the bottom ten countries, replaced by the Central African Republic. Notably, this group is characterized by low performance in ICT, transport, power, water and sanitation. It is evident that Libya, South Africa and Congo recorded the highest improvement, exceeding 3 points. Moreover, Congo Republic gained 7 positions in the ranking, moving from the 38th to 31st position. Cabo Verde recorded the worst performance, with its drop by 1.5 points, although the country remains in the top ten.

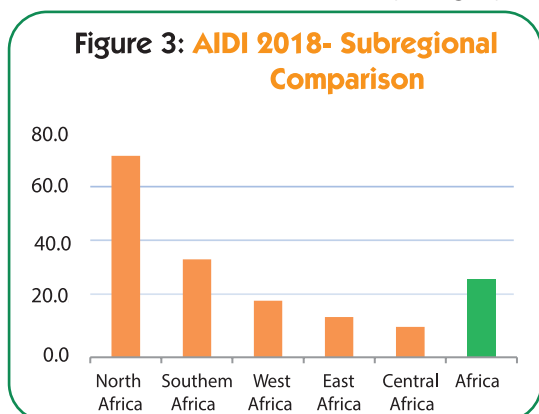
Figure 2: AIDI Selected Countries With Improved Scores



Detailed table on the AIDI index by country is presented in Annex 1.

3.2. Subregional analysis

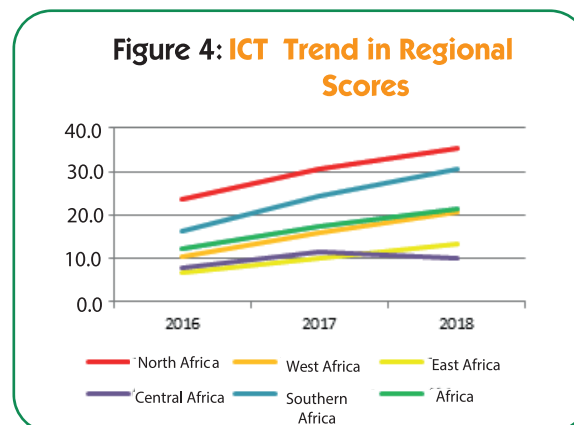
In the comparison of overall infrastructure development across Africa's five subregions, North Africa emerges as the top performer, followed by Southern Africa, West Africa, East Africa, and Central Africa (cf. Fig. 3).



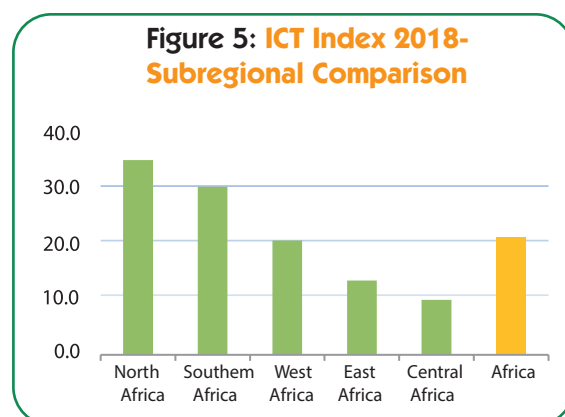
North and Southern Africa record higher performance in the following areas: ICT (mobile phone and internet subscription with greater international internet bandwidth), improved sanitation facilities, and transport.

On the other hand, West Africa performs well in fixed line phone subscriptions, the number of internet users, paved road density and, to a lesser degree, electricity generation.

Central Africa and East Africa recorded moderate and sometimes low performance in international internet bandwidth, paved road density, and phone subscriptions (both mobile and fixed). These subregions still have considerable potential for growth in these areas.



Between 2016 and 2018, Central Africa recorded a remarkable decline in both ICT and Electricity indexes. However, the subregion recorded a slight improvement in water and sanitation.

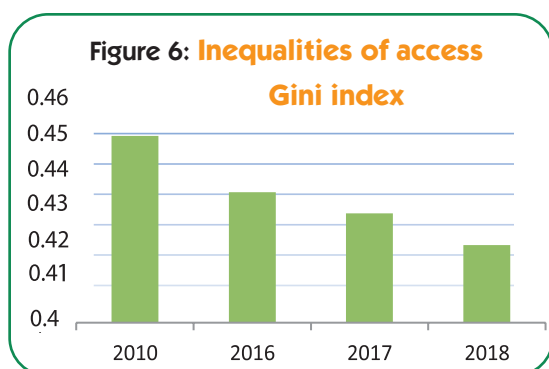


Annex 2 shows the Africa Infrastructure Development Index trend across subregions between 2016 and 2018.

3.3. Inequalities of access to infrastructure services

Africa has the world's fastest growing population and the highest poverty rate. The importance of access to basic infrastructure services on welfare is clear. The challenge of increasing access to these services across subregions is compounded by the unequal distribution of existing access for households in African Countries. We use the Gini coefficient here, with zero expressing perfect equality, which theoretically could mean equal access to infrastructure services, and 1 to extreme inequality.

Between 2010 and 2018, inequalities in population access to infrastructure service decreased across Africa. The Gini index for African countries as a whole was estimated at 0.422 in 2018, compared to 0.437 in 2016 and 0.453 in 2010 (cf. Fig 6).



The quintile share ratio is a measure of the inequality of distribution. It is calculated as the ratio of the average Index rate of the 20 percent of countries (weighted by their population) with the highest level (the top quintile) to the average of the index in the 20 percent of countries with the lowest level (the bottom quintile). This ratio shows also that inequality between African countries has decreased, falling from 10.2 in 2016 to 9.3 in 2018.

Table 1: AIDI 2018 – Classification into quintiles

	2016	2017	2018
Lower quintile	7.20	7.72	8.12
Second quintile	12.79	13.66	13.85
Third quintile	19.68	20.42	21.52
Fourth quintile	24.85	25.51	26.75
Upper quintile	73.48	74.43	75.23
Q5/Q1	10.2	9.6	9.3

4. Conclusion

Virtually all major countries improved their scores in the AIDI 2018, though at different rates. The top ten countries retained their overall rankings over the period. It is noteworthy that any significant improvement in the rankings of countries was mainly due to progress in the ICT sector and, to a lesser degree, in transport.

At the subregional level, no changes were recorded in the rankings over the period. However, although Central and East African countries (accounting for about 0.4 billion people) have maintained their 4th and 5th position respectively, these subregions have the greatest potential to improve their future scores and rankings.

Finally, although the inequalities of access to infrastructure services between countries seem to be reduced over the past few years, the difference between the top ten countries and those at the bottom remains quite significant.

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Annexes

Annex I

Table I.1 : The Composite Africa Infrastructure Development Index 2016-2018

Rank	Country	2016	Rank	Country	2017	Rank	Country	2018
1	Seychelles	93.927	1	Seychelles	94.109	1	Seychelles	94.324
2	Egypt	85.663	2	Egypt	85.350	2	Egypt	85.847
3	Libya	77.793	3	South Africa	79.635	3	Libya	81.413
4	South Africa	75.515	4	Libya	79.271	4	South Africa	78.527
5	Mauritius	74.076	5	Mauritius	75.493	5	Mauritius	76.787
6	Tunisia	66.262	6	Tunisia	66.974	6	Tunisia	68.982
7	Morocco	62.408	7	Morocco	61.998	7	Morocco	64.884
8	Algeria	53.393	8	Algeria	54.039	8	Algeria	55.793
9	Cabo Verde	49.431	9	Cabo Verde	50.431	9	Cabo Verde	47.955
10	Botswana	35.631	10	Botswana	36.607	10	Botswana	36.793
11	Namibia	28.799	11	Namibia	28.637	11	Gabon	30.670
12	Gabon	27.751	12	Gambia	28.159	12	Ghana	28.835
13	Gambia	27.612	13	Gabon	28.076	13	Namibia	28.652
14	São Tomé and	27.381	14	Ghana	27.384	14	Gambia	28.612
15	Ghana	26.097	15	São Tomé and	27.183	15	São Tomé and	27.143
16	Senegal	24.709	16	Swaziland	25.429	16	Senegal	25.965
17	Swaziland	24.626	17	Senegal	25.263	17	Swaziland	25.764
18	Kenya	24.372	18	Kenya	24.930	18	Kenya	25.604
19	Zimbabwe	24.148	19	Zimbabwe	24.429	19	Zimbabwe	24.518
20	Djibouti	23.926	20	Djibouti	24.300	20	Djibouti	24.461
21	Comoros	22.120	21	Comoros	22.150	21	Comoros	23.500
22	Zambia	21.546	22	Zambia	22.122	22	Nigeria	22.365
23	Nigeria	20.601	23	Nigeria	21.636	23	Zambia	22.289
24	Rwanda	20.453	24	Rwanda	20.750	24	Cote d'Ivoire	21.960
25	Uganda	20.003	25	Uganda	20.178	25	Malawi	21.018
26	Cote d'Ivoire	19.063	26	Cote d'Ivoire	19.661	26	Rwanda	20.768
27	Cameroon	19.032	27	Cameroon	19.294	27	Uganda	20.622
28	Malawi	18.449	28	Malawi	18.440	28	Cameroon	19.813
29	Equatorial Guinea	17.929	29	Equatorial Guinea	17.972	29	Angola	19.038
30	Burkina Faso	16.522	30	Angola	17.478	30	Equatorial Guinea	18.215
31	Angola	16.462	31	Burkina Faso	16.971	31	Congo. Rep.	17.531
32	Mauritania	16.195	32	Benin	16.017	32	Burkina Faso	17.055
33	Benin	15.781	33	Lesotho	15.680	33	Benin	16.228
34	Lesotho	15.690	34	Mali	15.677	34	Mauritania	16.050
35	Mali	15.051	35	Mauritania	15.522	35	Lesotho	16.008
36	Sudan	14.672	36	Sudan	15.031	36	Mali	15.948
37	Burundi	14.628	37	Congo. Rep.	14.950	37	Sudan	15.404
38	Congo. Rep.	14.467	38	Burundi	14.702	38	Burundi	15.112
39	Guinea	14.239	39	Guinea	14.682	39	Guinea	14.789
40	Guinea-Bissau	13.415	40	Guinea-Bissau	13.378	40	Liberia	14.485
41	Liberia	12.428	41	Liberia	12.822	41	Guinea-Bissau	13.536
42	Togo	12.174	42	Togo	12.765	42	Togo	12.971
43	Tanzania	11.979	43	Mozambique	12.301	43	Tanzania	12.543
44	Central African	11.868	44	Tanzania	12.239	44	Mozambique	12.495
45	Mozambique	11.606	45	Central African	11.830	45	Central African	11.951
46	Sierra Leone	9.388	46	Sierra Leone	9.975	46	Madagascar	10.734
47	Madagascar	8.448	47	Ethiopia	8.561	47	Sierra Leone	9.943
48	Eritrea	8.266	48	Madagascar	8.474	48	Ethiopia	9.699
49	Congo. Dem. Rep.	8.163	49	Eritrea	8.265	49	Eritrea	8.217
50	Ethiopia	7.557	50	Congo. Dem. Rep.	8.165	50	Congo. Dem. Rep.	8.148
51	Chad	6.638	51	Chad	6.808	51	Chad	7.239
52	Niger	5.336	52	Niger	5.762	52	Niger	5.508
53	South Sudan	4.940	53	South Sudan	4.549	53	South Sudan	4.603
54	Somalia	3.355	54	Somalia	3.404	54	Somalia	3.362

Table I.2: Electricity Index 2016-2018

Rank	Country	2016	Rank	Country	2017	Rank	Country	2018
1	Libya	100.00	1	Libya	99.86	1	Libya	100.00
2	South Africa	85.64	2	South Africa	77.73	2	South Africa	74.86
3	Seychelles	67.09	3	Seychelles	74.48	3	Seychelles	63.82
4	Mauritius	41.05	4	Mauritius	39.34	4	Mauritius	39.86
5	Egypt	35.45	5	Egypt	32.21	5	Egypt	32.77
6	Algeria	30.53	6	Tunisia	28.79	6	Tunisia	28.68
7	Tunisia	28.66	7	Algeria	27.43	7	Algeria	28.52
8	Gabon	25.44	8	Gabon	24.24	8	Botswana	21.52
9	Morocco	15.46	9	Botswana	17.59	9	Gabon	20.61
10	Zambia	15.11	10	Zambia	15.79	10	Cabo Verde	15.55
11	Namibia	14.83	11	Morocco	14.10	11	Morocco	14.23
12	Cabo Verde	11.73	12	Cabo Verde	13.79	12	Zambia	14.08
13	Mozambique	10.24	13	Zimbabwe	11.25	13	Mozambique	12.05
14	Zimbabwe	10.09	14	Mozambique	11.04	14	Namibia	10.54
15	Ghana	9.20	15	Namibia	11.03	15	Zimbabwe	10.38
16	Congo, Dem. Rep.	7.61	16	Swaziland	9.73	16	Equatorial Guinea	8.61
17	Djibouti	7.33	17	Ghana	8.55	17	Djibouti	7.92
18	Sao Tome and Principe	7.29	18	Djibouti	8.03	18	Ghana	6.95
19	Swaziland	6.18	19	Angola	6.66	19	Angola	6.40
20	Cote d'Ivoire	6.08	20	Congo, Rep.	6.62	20	Cote d'Ivoire	6.22
21	Mauritania	5.35	21	Sao Tome and Principe	6.59	21	Congo, Rep.	6.19
22	Cameroon	5.27	22	Cote d'Ivoire	6.25	22	Sao Tome and Principe	5.94
23	Sudan	5.25	23	Sudan	5.32	23	Swaziland	5.78
24	Angola	4.56	24	Cameroon	5.21	24	Sudan	5.38
25	Senegal	4.31	25	Senegal	4.14	25	Mauritania	5.37
26	Lesotho	3.93	26	Lesotho	4.11	26	Cameroon	4.81
27	Kenya	3.63	27	Kenya	3.54	27	Lesotho	4.11
28	Nigeria	3.27	28	Mauritania	3.48	28	Senegal	4.08
29	Malawi	2.63	29	Nigeria	2.79	29	Kenya	3.49
30	Equatorial Guinea	2.29	30	Gambia, The	2.65	30	Nigeria	2.72
31	Gambia, The	2.28	31	Malawi	2.12	31	Mali	2.02
32	Tanzania	2.09	32	Equatorial Guinea	2.01	32	Malawi	2.01
33	Congo, Rep.	1.94	33	Tanzania	1.98	33	Gambia, The	1.96
34	Madagascar	1.89	34	Congo, Dem. Rep.	1.95	34	Congo, Dem. Rep.	1.86
35	Uganda	1.63	35	Ethiopia	1.62	35	Tanzania	1.83
36	Ethiopia	1.45	36	Mali	1.44	36	Ethiopia	1.69
37	Guinea	1.41	37	Guinea	1.33	37	Uganda	1.31
38	Botswana	1.40	38	Uganda	1.29	38	Guinea	1.25
39	Liberia	1.27	39	Liberia	1.09	39	Eritrea	1.15
40	Mali	1.26	40	Madagascar	0.93	40	Comoros	1.07
41	Eritrea	1.23	41	Eritrea	0.92	41	Liberia	1.03
42	Comoros	0.97	42	Comoros	0.89	42	Madagascar	0.95
43	Central African Republic	0.63	43	Sierra Leone	0.72	43	Burkina Faso	0.78
44	Somalia	0.45	44	Rwanda	0.66	44	Rwanda	0.77
45	Rwanda	0.44	45	Central African Republic	0.62	45	Central African Republic	0.49
46	Burkina Faso	0.40	46	Burkina Faso	0.58	46	Somalia	0.43
47	Guinea-Bissau	0.37	47	Niger	0.43	47	Benin	0.37
48	Sierra Leone	0.33	48	Somalia	0.38	48	Sierra Leone	0.35
49	Burundi	0.30	49	Burundi	0.37	49	Niger	0.30
50	Niger	0.28	50	Guinea-Bissau	0.21	50	Burundi	0.23
51	Chad	0.18	51	Benin	0.21	51	Guinea-Bissau	0.19
52	Benin	0.17	52	Chad	0.14	52	Chad	0.14
53	Togo	0.14	53	Togo	0.12	53	Togo	0.06
54	South Sudan	...	54	South Sudan	...	54	South Sudan	...

Table I.3 : Transport Index 2016-2018

Rank	Country	2016	Rank	Country	2017	Rank	Country	2018
1	Egypt	55.38	1	Libya	58.71	1	Libya	58.49
2	Libya	52.84	2	Egypt	55.68	2	Egypt	56.75
3	Seychelles	50.51	3	Seychelles	50.52	3	Seychelles	50.33
4	Mauritius	36.1	4	Mauritius	37.44	4	Mauritius	38.40
5	Cabo Verde	26.59	5	Cabo Verde	26.68	5	Cabo Verde	26.56
6	Botswana	24.46	6	Botswana	22.52	6	Botswana	22.29
7	Algeria	18.21	7	South Africa	22.08	7	South Africa	21.92
8	Namibia	17.72	8	Algeria	17.35	8	Algeria	17.11
9	Comoros	15.58	9	Comoros	17.15	9	Comoros	15.65
10	Sao Tome and Principe	13.94	10	Ghana	16.26	10	Namibia	15.50
11	Lesotho	12.98	11	Namibia	15.84	11	Guinea-Bissau	14.26
12	Rwanda	12.93	12	Sao Tome and Principe	14.30	12	Sao Tome and Principe	14.17
13	South Africa	12.73	13	Rwanda	12.93	13	Rwanda	12.94
14	Zimbabwe	12.40	14	Zambia	12.14	14	Ghana	12.41
15	Djibouti	12.24	15	Kenya	12.14	15	Kenya	12.09
16	Kenya	12.19	16	Djibouti	11.97	16	Djibouti	11.85
17	Ghana	12.16	17	Zimbabwe	11.84	17	Burkina Faso	11.83
18	Burkina Faso	10.66	18	Burkina Faso	11.69	18	Zimbabwe	11.69
19	Tunisia	10.57	19	Tunisia	10.30	19	Tunisia	10.22
20	Morocco	9.90	20	Gambia, The	9.93	20	Burundi	9.54
21	Zambia	9.27	21	Morocco	9.52	21	Morocco	9.43
22	Burundi	9.00	22	Burundi	9.44	22	Swaziland	8.37
23	Uganda	8.61	23	Swaziland	8.43	23	Gambia, The	8.23
24	Swaziland	8.50	24	Togo	7.87	24	Lesotho	7.41
25	Gambia, The	8.13	25	Lesotho	7.44	25	Guinea	7.29
26	Togo	6.78	26	Guinea	7.38	26	Uganda	7.03
27	Cote d'Ivoire	6.60	27	Uganda	7.13	27	Togo	6.87
28	Guinea	5.87	28	Cote d'Ivoire	7.10	28	Cote d'Ivoire	6.66
29	Mauritania	5.28	29	Nigeria	5.10	29	Nigeria	5.09
30	Benin	4.95	30	Benin	5.01	30	Benin	4.94
31	Nigeria	4.89	31	Malawi	4.90	31	Malawi	4.84
32	Malawi	4.88	32	Mauritania	4.70	32	Zambia	4.71
33	Guinea-Bissau	4.78	33	Guinea-Bissau	4.60	33	Mauritania	4.59
34	Sierra Leone	4.29	34	Sierra Leone	4.47	34	Sierra Leone	4.46
35	Gabon	4.17	35	Gabon	4.01	35	Gabon	3.93
36	Tanzania	3.84	36	Senegal	3.42	36	Senegal	3.36
37	Cameroon	3.65	37	Tanzania	3.29	37	Tanzania	3.27
38	Senegal	3.47	38	Madagascar	3.05	38	Liberia	3.02
39	Madagascar	3.02	39	Central African Republic	3.05	39	Central African Republic	3.02
40	Central African Republic	3.00	40	Liberia	3.04	40	Madagascar	3.01
41	Liberia	2.93	41	Congo, Rep.	2.89	41	Equatorial Guinea	2.74
42	Mali	2.63	42	Equatorial Guinea	2.74	42	Cameroon	2.60
43	Equatorial Guinea	2.55	43	Cameroon	2.62	43	Mali	2.36
44	Congo, Rep.	2.30	44	Mali	2.42	44	Congo, Rep.	2.28
45	Angola	2.04	45	Ethiopia	2.24	45	Ethiopia	2.23
46	Somalia	2.00	46	Somalia	2.04	46	Mozambique	2.02
47	Niger	1.99	47	Niger	1.93	47	Somalia	1.99
48	Mozambique	1.90	48	Angola	1.91	48	Niger	1.89
49	Ethiopia	1.68	49	Mozambique	1.85	49	Angola	1.88
50	Congo, Dem. Rep.	1.54	50	Congo, Dem. Rep.	1.65	50	Congo, Dem. Rep.	1.64
51	Eritrea	1.29	51	Eritrea	1.53	51	Eritrea	1.50
52	Chad	1.13	52	Chad	1.27	52	Chad	1.26
53	Sudan	0.57	53	Sudan	0.58	53	Sudan	0.56
54	South Sudan	0.05	54	South Sudan	0.10	54	South Sudan	0.00

Table I.4 : ICT Index 2016-2018

Rank	Country	2016	Rank	Country	2017	Rank	Country	2018
1	South Africa	41.438	1	South Africa	61.821	1	South Africa	76.938
2	Seychelles	34.713	2	Seychelles	50.560	2	Seychelles	59.785
3	Mauritius	31.494	3	Mauritius	46.977	3	Mauritius	58.669
4	Morocco	28.023	4	Morocco	35.741	4	Morocco	40.102
5	Egypt	26.664	5	Tunisia	32.479	5	Tunisia	38.124
6	Tunisia	22.697	6	Egypt	31.748	6	Algeria	36.534
7	Libya	19.160	7	Algeria	26.660	7	Egypt	33.945
8	Gabon	15.914	8	Kenya	23.727	8	Botswana	30.625
9	Kenya	15.450	9	Botswana	23.586	9	Kenya	29.943
10	Botswana	14.666	10	Libya	23.174	10	Libya	26.214
11	Algeria	14.457	11	Cabo Verde	20.803	11	Gabon	25.969
12	Nigeria	13.678	12	Gabon	20.793	12	Nigeria	25.450
13	Cabo Verde	12.965	13	Nigeria	20.317	13	Cabo Verde	25.272
14	Namibia	12.255	14	Namibia	18.161	14	Namibia	22.088
15	Cameroon	11.879	15	Cameroon	18.011	15	Ghana	22.075
16	Senegal	10.907	16	Senegal	15.937	16	Cameroon	21.497
17	Zimbabwe	10.611	17	Ghana	15.719	17	Gambia. The	20.916
18	South Sudan	10.218	18	Gambia. The	15.379	18	Cote d'Ivoire	20.631
19	Swaziland	9.820	19	Mali	15.333	19	Senegal	19.000
20	Ghana	9.551	20	Swaziland	14.715	20	Sao Tome and Principe	18.935
21	Sao Tome and Principe	9.204	21	Cote d'Ivoire	13.569	21	Mali	18.661
22	Sudan	9.189	22	Zimbabwe	13.538	22	Swaziland	18.321
23	Gambia. The	9.187	23	Sudan	13.408	23	Zimbabwe	16.361
24	Mali	8.673	24	Sao Tome and Principe	13.320	24	Lesotho	16.351
25	Equatorial Guinea	8.021	25	Lesotho	12.406	25	Sudan	16.108
26	Angola	7.986	26	Equatorial Guinea	11.837	26	Mauritania	14.940
27	Mauritania	7.932	27	Mauritania	11.791	27	Zambia	14.931
28	Congo. Dem. Rep.	7.890	28	Zambia	11.242	28	Equatorial Guinea	14.668
29	Zambia	7.700	29	Congo. Dem. Rep.	11.234	29	Congo. Rep.	14.656
30	Benin	7.353	30	Angola	10.855	30	Rwanda	13.560
31	Cote d'Ivoire	6.960	31	Uganda	10.209	31	Benin	12.750
32	Uganda	6.783	32	Benin	9.899	32	Burkina Faso	12.476
33	Lesotho	6.673	33	Rwanda	9.700	33	Uganda	12.198
34	Djibouti	5.909	34	Djibouti	9.055	34	Angola	11.785
35	Rwanda	5.676	35	Burkina Faso	8.775	35	Djibouti	11.354
36	Burkina Faso	5.175	36	Mozambique	8.460	36	Mozambique	11.179
37	Togo	4.975	37	Liberia	8.265	37	Togo	11.148
38	Tanzania	4.948	38	Togo	8.200	38	Guinea	11.046
39	Liberia	4.739	39	Sierra Leone	7.533	39	Liberia	11.004
40	Comoros	4.595	40	Tanzania	7.463	40	Sierra Leone	10.655
41	Guinea	4.310	41	Guinea	7.403	41	Tanzania	10.426
42	Mozambique	4.184	42	Comoros	7.051	42	Ethiopia	9.514
43	Guinea-Bissau	4.167	43	Guinea-Bissau	6.759	43	Comoros	8.950
44	Somalia	4.041	44	South Sudan	6.422	44	Guinea-Bissau	8.785
45	Malawi	3.151	45	Congo. Rep.	6.186	45	South Sudan	8.008
46	Sierra Leone	3.113	46	Somalia	6.022	46	Somalia	7.531
47	Congo. Rep.	3.060	47	Ethiopia	5.708	47	Malawi	7.017
48	Ethiopia	3.035	48	Malawi	5.066	48	Congo. Dem. Rep.	6.991
49	Madagascar	2.989	49	Madagascar	4.908	49	Burundi	6.661
50	Niger	2.873	50	Niger	4.671	50	Madagascar	6.451
51	Chad	2.816	51	Chad	4.419	51	Niger	5.951
52	Central African Republic	2.523	52	Burundi	3.635	52	Chad	5.376
53	Burundi	1.838	53	Central African Republic	3.302	53	Central African Republic	4.264
54	Eritrea	0.583	54	Eritrea	0.928	54	Eritrea	1.210

Table I.5 : Water Supply and Sanitation Index 2016-2018

Rank	Country	2016	Rank	Country	2017	Rank	Country	2018
1	Egypt	97.60	1	Egypt	97.75	1	Egypt	97.90
2	Seychelles	97.07	2	Mauritius	97.56	2	Mauritius	97.52
3	Tunisia	94.47	3	Seychelles	96.88	3	Seychelles	96.88
4	Algeria	83.49	4	Tunisia	95.17	4	Tunisia	95.18
5	Botswana	79.91	5	Algeria	83.01	5	Algeria	82.80
6	Cabo Verde	79.6	6	Cabo Verde	81.50	6	Cabo Verde	81.60
7	South Africa	78.19	7	Botswana	80.76	7	Botswana	80.82
8	Gambia, The	73.36	8	South Africa	79.41	8	South Africa	80.00
9	Djibouti	67.53	9	Morocco	78.90	9	Morocco	79.03
10	Gabon	66.61	10	Gambia, The	74.19	10	Gambia, The	74.24
11	Sao Tome and Principe	66.16	11	Djibouti	68.68	11	Djibouti	68.70
12	Namibia	63.32	12	Gabon	68.43	12	Gabon	68.50
13	Rwanda	63.15	13	Sao Tome and Principe	67.95	13	Sao Tome and Principe	68.02
14	Malawi	61.5	14	Malawi	64.3	14	Malawi	65.84
15	Comoros	61.49	15	Rwanda	64.19	15	Rwanda	65.02
16	Swaziland	61.37	16	Comoros	63.31	16	Namibia	63.34
17	Morocco	60.48	17	Namibia	62.61	17	Comoros	63.33
18	Senegal	57.98	18	Swaziland	61.6	18	Swaziland	61.60
19	Burundi	57.52	19	Senegal	59.46	19	Senegal	60.23
20	Mauritius	56.82	20	Burundi	58.40	20	Burundi	58.48
21	Cameroon	56.03	21	Cameroon	56.97	21	Cameroon	57.23
22	Zimbabwe	53.46	22	Lesotho	54.35	22	Lesotho	54.57
23	Lesotho	52.70	23	Zimbabwe	54.20	23	Zimbabwe	53.97
24	Equatorial Guinea	51.09	24	Ghana	51.58	24	Ghana	52.48
25	Cote d'Ivoire	48.9	25	Cote d'Ivoire	50.79	25	Cote d'Ivoire	50.98
26	Ghana	48.82	26	Equatorial Guinea	50.02	26	Equatorial Guinea	50.08
27	Burkina Faso	47.71	27	Burkina Faso	49.65	27	Burkina Faso	49.96
28	Zambia	47.04	28	Zambia	48.05	28	Zambia	48.74
29	Uganda	44.36	29	Uganda	47.08	29	Mali	48.37
30	Benin	44.22	30	Guinea-Bissau	46.76	30	Guinea-Bissau	48.25
31	Guinea-Bissau	43.86	31	Mali	46.62	31	Uganda	47.23
32	Mali	43.73	32	Benin	46.55	32	Benin	46.69
33	Guinea	43.51	33	Guinea	45.92	33	Guinea	46.06
34	Libya	42.14	34	Nigeria	43.51	34	Nigeria	44.06
35	Nigeria	42.06	35	Congo, Rep.	43.22	35	Liberia	43.66
36	Congo, Rep.	41.25	36	Liberia	42.83	36	Congo, Rep.	43.44
37	Mauritania	40.83	37	Libya	42.30	37	Libya	42.27
38	Liberia	40.61	38	Mauritania	41.18	38	Mauritania	41.33
39	Angola	39.53	39	Kenya	40.54	39	Central African Republic	40.68
40	Central African Republic	39.31	40	Central African Republic	40.54	40	Kenya	40.63
41	Kenya	39.23	41	Angola	39.62	41	Angola	40.15
42	Sudan	31.22	42	Ethiopia	33.26	42	Ethiopia	35.25
43	Ethiopia	30.79	43	Sudan	31.84	43	Sierra Leone	32.30
44	Congo, Dem. Rep.	30.72	44	Congo, Dem. Rep.	31.51	44	Congo, Dem. Rep.	31.93
45	Togo	29.68	45	Sierra Leone	31.44	45	Togo	31.87
46	Sierra Leone	29.54	46	Togo	31.33	46	Sudan	31.85
47	Eritrea	28.65	47	Eritrea	29.71	47	Eritrea	29.85
48	Mozambique	28.00	48	Tanzania	27.80	48	Tanzania	28.16
49	Tanzania	26.67	49	Niger	27.76	49	Niger	27.89
50	Niger	25.95	50	Mozambique	26.91	50	Mozambique	27.11
51	South Sudan	25.08	51	South Sudan	26.28	51	South Sudan	26.30
52	Chad	22.09	52	Chad	22.89	52	Madagascar	23.42
53	Madagascar	21.19	53	Madagascar	22.69	53	Chad	22.95
54	Somalia	14.44	54	Somalia	14.23	54	Somalia	14.23

Annex II

Table II.1 : Africa Infrastructure Development Index 2016-2018 by Sub-Region

Rank	Subregion	2016	Rank	Subregion	2017	Rank	Subregion	2018
1	North Africa	71.63	1	North Africa	71.62	1	North Africa	72.96
2	Southern Africa	33.47	2	Southern Africa	34.97	2	Southern Africa	35.46
3	West Africa	18.92	3	West Africa	19.76	3	West Africa	20.47
4	East Africa	13.52	4	East Africa	14.00	4	East Africa	14.60
5	Central Africa	10.69	5	Central Africa	10.78	5	Central Africa	11.04
	Africa	27.12		Africa	27.75		Africa	28.44

Annex III

Table III.1: AIDI Components and Indicators

Composite Index	Indicators	Sub-indicators
I. Transport Composite Index	<p>I.a Total Paved Roads (km per 10,000 inhabitants): The country's total surface with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete, or with cobblestones. The indicator is measured in km per 10,000 inhabitants as a proxy of access to the paved road network.</p>	
	<p>I.b Total Road Network in Km (per km² of exploitable land area): - The total road surface (both paved and non-paved roads) of a given country. The indicator is measured in km (per km² of exploitable land area). - Exploitable land area is the total surface area of a country minus the surface area of deserts, forest, mountains and other inaccessible areas.</p>	
II. Electricity Index: Net Generation (kWh per inhabitant)	The total electricity production of a given country, including the energy imported from abroad. This includes both private and public energy generated. The indicator is measured in millions of kilowatt-hours produced per hour and per inhabitant.	
III. ICT Composite Index (ICT)	<p>III.a Total Phone Subscriptions (per 100 inhabitants) : The total number of phone subscriptions in a country, both fixed telephone lines and mobile cellular telephone subscriptions, in a given year. For the purpose of the AIDI, the indicator is per 100 inhabitants.</p>	<p>III.a.1 Fixed-line Telephone Subscriptions (% population): Active line connecting the subscriber's terminal equipment to the Public Switched Telephone Network (PSTN) and which has a dedicated port in the telephone exchange equipment.</p>
		<p>III.a.2 Mobile - Cellular Subscriptions (% population) : Refers to the subscriptions to a public mobile telephone service, which provide access to the Public Switched Telephone Network (PSTN) using cellular technology. This indicator includes the number of pre-paid SIM cards active during the past three months. This indicator includes both analogue and digital cellular systems IMT-2000 (Third Generation, 3G) and 4G subscriptions.</p>
	<p>III.b Number of Internet Users (per 100 inhabitants): The estimated number of Internet users in the total population. This includes those using the Internet from any device (including mobile phones) in the last 12 months.</p>	

	<p>III.c Fixed (wired) Broadband Internet Subscribers (per 100 inhabitants): Total Internet subscriptions using fixed (wired) broadband technologies to access the Internet. Subscriptions that have access to data communications (including the Internet) via mobile cellular networks are excluded. For the purpose of the AIDI, the indicator is reported per 100 inhabitants.</p>	
	<p>III.d. International Internet Bandwidth (Mbps): Total capacity of international Internet bandwidth in megabits per second (Mbps). If capacity is asymmetric (i.e. more incoming than outgoing), the incoming capacity should be provided. This is measured as the sum of capacity of all Internet exchanges offering international bandwidth.</p>	
<p>IV. Water and Sanitation Composite Index (WSS)</p>	<p>IV.a. Improved Water Source (% of population with access): Access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Unimproved sources include vendors, tanker trucks, and unprotected wells and springs. Reasonable access is defined as the availability of at least 20 liters a person per day from a source within 1 km of the dwelling.</p>	
	<p>IV.b Improved Sanitation Facilities (% of population with access): Access to improved sanitation facilities refers to the percentage of the population with at least adequate access to excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, facilities must be correctly constructed and properly maintained.</p>	

III.2 Methodology

Data for the four components of the AIDI are collected from various sources. Each component represents a different facet of infrastructure development. The following four steps are used in calculating the index:

Step 1: Normalization Procedure. Since the components of the AIDI are originally measured in different units, the observations are “standardized” or “normalized” to permit averaging, with the average regarded as a composite index. The normalization procedure used is the min–max formula applied to all observed values of each component during the period 2000–2010. This procedure adjusts the “normalized component” to take values between 0 and 100 over the indicated period.

Step 2: Calculate a Composite Index for each Component. The composite index is calculated as a weighted average of indicators for each component that comprise more than one indicator. The weights are based on the inverse of the standard deviation of each normalized component: $y_t = (\sigma_{tot} / \sigma_x) * x_t$; where σ_{tot} is given by $1 / \sigma_{tot} = \sum x (1 / \sigma_x)$ and σ_x is the standard deviation of the normalized component x . The rationale for step 2 is to reduce the impact of the most volatile components on the composite index and consequently the volatility of the rankings.

Step 3: Generate the AIDI Composite Index: The AIDI composite Index is computed using the sub-indices of the four components and using the same method described in step 2.

Step 4: Generate the Subregional AIDI. Indices by subregion are calculated as a weighted average of the normalized components of the countries within the subregion. The weighting variables selected are as follows: population size is used for electricity, water, sanitation and ICT (phone and internet) subscriptions, while the road network size is used for paved roads.