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The Africa Infrastructure Development Index (AIDI) 2020

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1. Introduction

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 improvements in economic growth in Africa witnessed over the last decade and has the potential to contribute much more, given a conducive environment.

Constraining factors arising from the Covid-19 pandemic that may curb infrastructure development going forward include: heightened investor risk aversion, which has spurred unprecedented capital outflows from the region; significantly increased government debt burdens due to the need to focus on the health crisis and to instigate policies to mitigate short-term economic damage to the economy; weaker external demand particularly for oil, which is the backbone of economies such as Nigeria; as well as a dramatic fall in global and inter-regional travel and tourism receipts.

In this new and unprecedented landscape, the need to ramp up infrastructure development has become ever more urgent. For example, the importance of safe and readily accessible water sources, as well as improved sanitation, are prerequisites for contain-

ing and defeating the spread of the pandemic. Water and sanitation is one of the four components of the Infrastructure sector.

The decline in the use of transport (including buses, cars and airplanes) worldwide during the pandemic, largely also due to the lockdowns, has led to steep declines in oil revenues and to tourism generally, on which a large number of African countries rely. Transport and power are the other Infrastructure components that will require policy reform and investment to secure long-term growth recovery.

Given the Covid-19 crisis, it is fitting that Infrastructure development across Africa remains a central pillar of the African Development Bank's mission. Indeed, it is articulated as such in the Bank's 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), with its own dedicated Portal, to improve the availability of statistical information on infrastructure development across the continent. A core aim is to assist individual countries in benchmarking the relative performance of their infrastructure sectors and in formulating their own country-specific strategies in the light of regional experience. The AIKP al-

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lows an improved evaluation of the collective efforts to meet Africa's infrastructure needs by establishing a baseline of the current situation across the continent.

This brief presents the latest information on progress made by African countries using data collected by the Bank under its AIKP initiative. It also discusses the reasons behind the latest trends.

The first edition of the brief was conducted in 2013, the second in 2016 and the third in 2018. The present bulletin covers the period 2000–2020 and monitors the status and progress of infrastructure development across the continent. The update presents selected indicators that comprise the Index's infrastructure components, namely: (i) transport; (ii) power; (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. The AIDI data is generated annually and used to inform the annual performance-based allocation of African Development Fund (ADF) resources among eligible African countries.

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 is critical for informing private and public sector investment decisions, including Bank-managed support in African countries.

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

2. The AIDI 2020 Highlights

An overall improvement in AIDI 2020 scores

Between 2018 and 2020, the AIDI index scores improved for all African countries. The overall index calculated on a continent-wide scale increased from 28.44 to 29.63. The range of performance indices for the top ten countries increased from 36.79–94.32 in 2018 to 35.50–96.73 in 2020 (see Figure 1 and Table A.1 in Annex A). However, the im-

provement in the scores for the ten bottom-ranked countries remains weaker. For these countries, the range of indices decreased from 3.62–12.50 in 2018 to 4.53–12.60 in 2020. In general, the progress stems from improvements in the sector indices for water and sanitation and for ICT.

The top ten performers in the 2020 rankings

As illustrated in Figure 1, the top ten performers for the composite AIDI index (which includes transport, power, ICT, and water and sanitation) are, in order of magnitude: Seychelles, Egypt, Libya, South Africa, Mauritius, Tunisia, Morocco, Algeria, Cabo Verde and Botswana. The country rankings for each of the four component indices (ICT, power, transport, and water and sanitation) are provided in Annex A, Tables A.1.–A.5.

The worst-performing countries

The ten worst-performing countries in the 2020 index remain unchanged. For this bottom-ranking group, the development of the various infrastructure subsectors remains slow. These countries made marginal progress of one index point or less in developing their infrastructure, except for Somalia (+1.17) and Sierra Leone (+1.57). Most of these countries are transitional states and/or are emerging from conflict. They comprise Central African Republic, Sierra Leone, Madagascar, Ethiopia, Eritrea, the Democratic Republic of Congo, Chad, Niger, South Sudan, and Somalia.

The major gainers

The major gainers are the countries that have made major improvements in their scores since the 2018 AIDI. With a 3.25-point gain on the index, Senegal improved its ranking by the greatest margin. Other big performers include Egypt (2.54), eSwatini (2.44), Seychelles (2.41), and Tanzania (2.35).

During the same period of 2018–2020, the ranking of the top ten countries remains unchanged, as listed in Figure 1, with Seychelles and Egypt retaining the top two positions and recording a remarkable improvement exceeding 2 points. Guinea, thanks to progress across all four infrastructure components, but particularly in water and sanitation and ICT, moved up four places in the rankings, followed by Côte d'Ivoire and Tanzania which rose by three ranks owing to their improved scores for ICT and water and sanitation. The prioritization by these countries to investments in these two subsectors, confirms their criticality for economic growth.

The main losers in the 2020 rankings

Although all countries improved overall on the index, some countries made weak progress and saw their rankings fall

during 2018–2020. These include Benin, which dropped four positions in the rankings (0.30 points) and Liberia, which fell by three positions in the rankings.

Subregional rankings remain stable

The ranking of the five African subregions remains unchanged, with North Africa still leading, followed by Southern Africa, West Africa, East Africa, and Central Africa. North Africa emerged as the best-performing subregion with an average index improvement of 2.23 points, followed by East Africa (1.55 points). Central Africa recorded the lowest increase with 0.64 points.

ICT emerges as the main driver of AIDI improvements

Of all the components, ICT has recorded the strongest growth over the past ten years. Unsurprisingly, the highest ranked countries on the index are those with the greatest growth in this subsector.

According to a study conducted by the Bank's Statistics Department entitled "Investment Needs in Tele-communications Infrastructure 2018–2022," the 2015–2020 period is characterized by an upgrade and modernization of mobile networks to support the transition to smartphones. Broadband and fiber access are the major new emerging trends and will require major funding in the coming years.

The 2015–2020 period has also seen the installation of new regional submarine and terrestrial cables. These have considerably increased the transmission capacities around the coast of Africa and have consolidated the mobile operators.

Based on 160 algorithmic models adapted to economic conditions and certain factors such as the coverage and growth of the volume of mobile data, the Bank's Statistics Department produced an overall estimate of the investment required for the mobile ICT subsector at USD 24.3 billion.

The power sector: effort is still required

The power sector also needs more investment. According to a study undertaken by the Bank's Statistics Department, an average annual investment of USD 29–39 billion is required to meet the energy infrastructure investment needs.

Despite the progress made in some countries on the continent to scale up their power development, growth has not been significant enough to affect country rankings. Electricity production levels generally remain constant across Africa.

Water supply and sanitation: a slight improvement

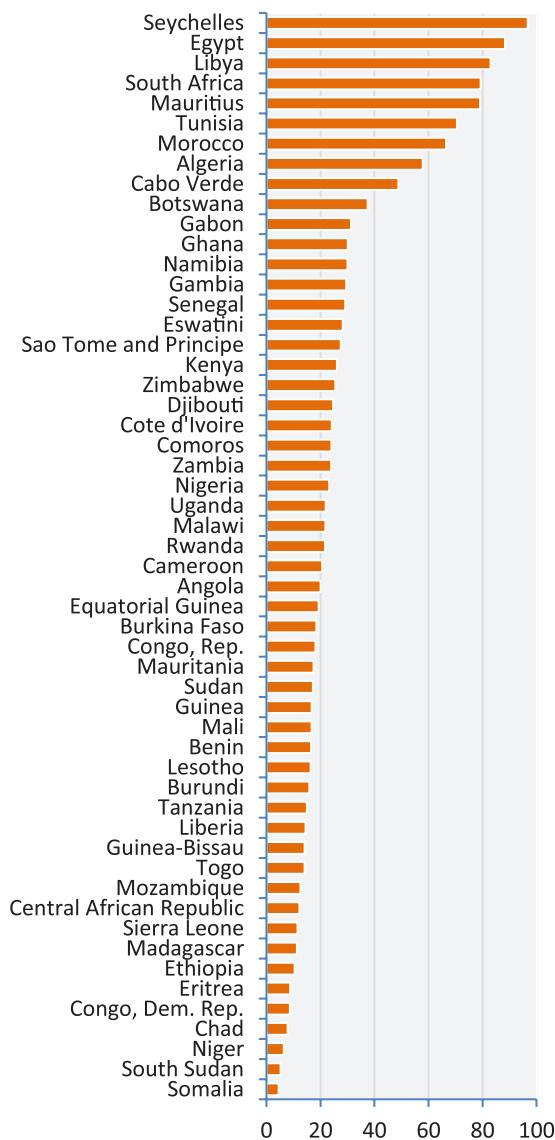
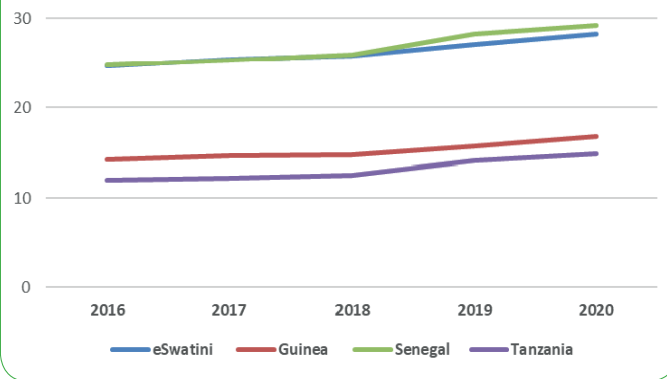
Improving access to a healthy and sustainable water source is an important pillar for achieving the Sustainable Development Goals (SDGs) and implementing the Bank's High 5s agenda.

Despite their positioning at the bottom global Index (see Table A.1 in Annex A), these countries too have made significant progress in terms of access to safe water and sanitation. These include Somalia, with the largest improvement (6.28 points), Mozambique (5.90 points), Tanzania (5.42 points) and Ethiopia (4.90 points). A slight improvement at the continental level was recorded, unlike the disappointing results of the previous period.

3. Main Results

Country comparisons: summary

The results of the Africa Infrastructure Development Index 2020 are presented in the form of scores and rankings based on data collected by the Bank during the period 2000–2017.

Figure 1. AIDI 2020, Country Scores**Figure 2. AIDI Selected Countries With Improved Scores**

The bottom ten countries in the rankings remain almost unchanged. These countries are Central Africa Republic, Madagascar (which fell in the ranking in 2020 and ceded its place to Sierra Leone), Ethiopia, Eritrea, the Democratic Republic of Congo, Chad, Niger, South Sudan and Somalia, which continuously occupies last place despite the considerable progress it has made.

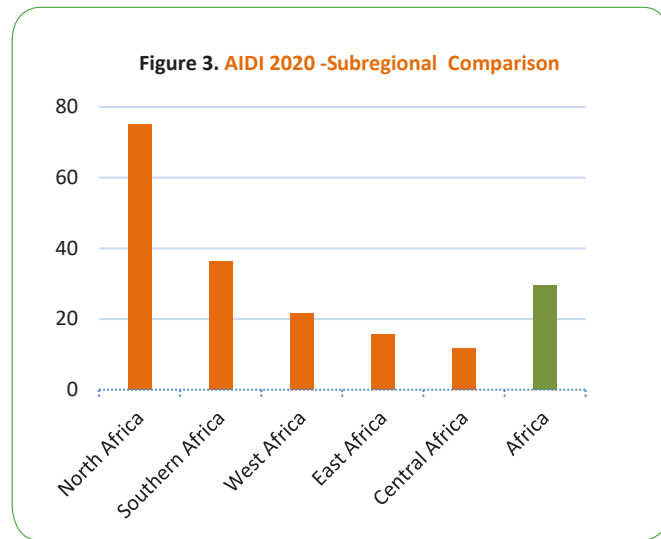
Guinea has risen four places in the ranking, moving from 39th in 2018 to 35th place in 2020 thanks to a strong performance in ICT and improved access to safe drinking water.

Table A.1 in Annex A presents a composite picture of the full AIDI rankings and scores of all African countries for the three years 2018, 2019 and 2020. Tables A.2 –A.5 focus on individual country performance rankings for the four component indices during the same three years

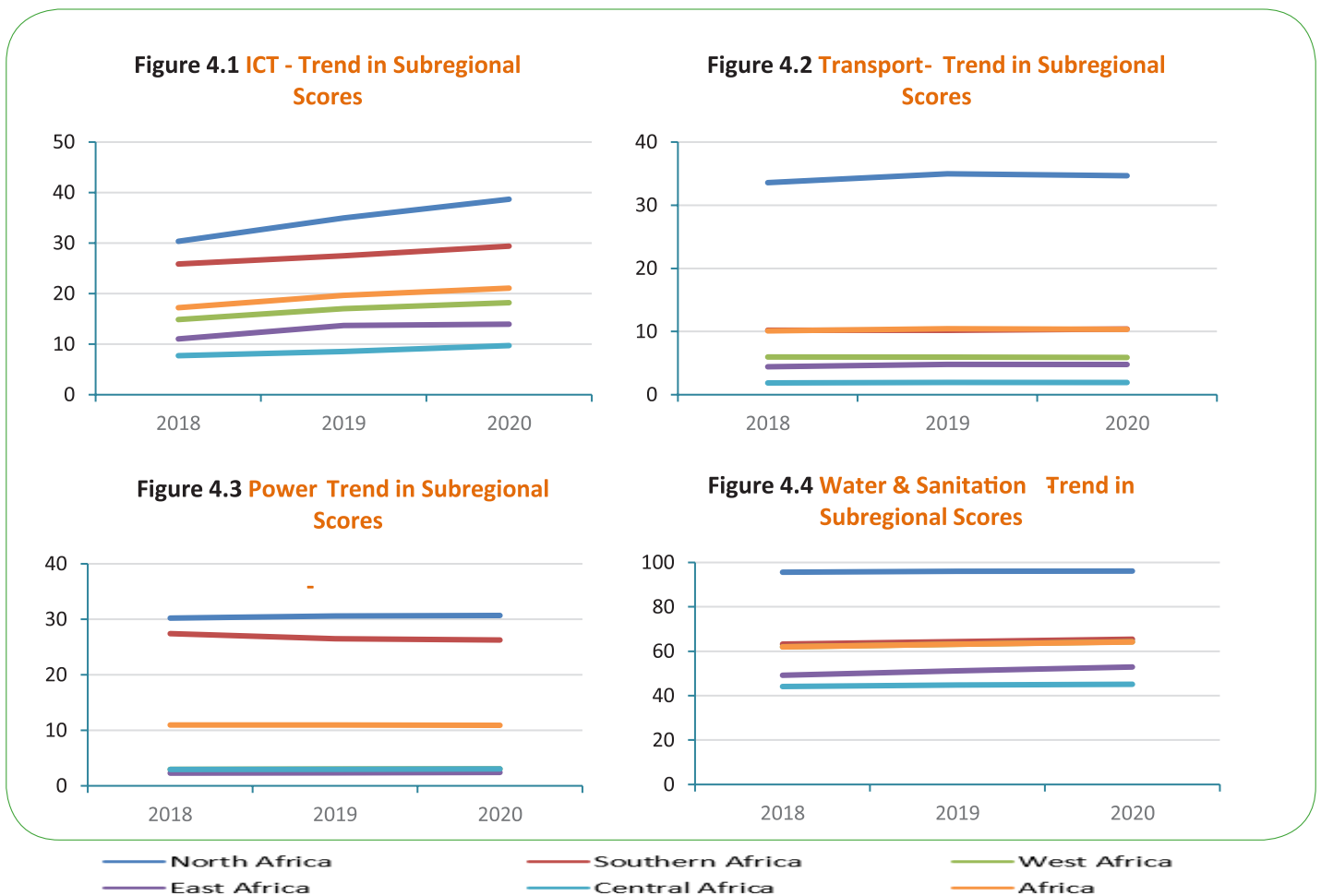
Subregional analysis of infrastructure development

A comparison of the overall development of infrastructure in the five African subregions places North Africa in the lead with the best performance over the period (2.23 points), followed by Southern Africa, West Africa, East Africa, and Central Africa (Figure 3).

The results show that the ranking of the top ten countries remains unchanged compared to 2018 – Seychelles, Egypt, Libya, South Africa, Mauritius, Tunisia, Morocco, Algeria, Cabo Verde and Botswana (see Table A.1). All these countries are characterized by a robust investment performance across all infrastructure subsectors. Among these ten countries, five are located in North Africa and three are island countries where tourism is a major contributor to the economy. These countries have therefore traditionally focused on improving infrastructure to attract visitors.



Figures 4.1 to 4.4 illustrate the evolution of the component indices over the 2018–2020 period. More detailed statistics for the subregional performance are presented in Table B.1 in Annex B.



North Africa has seen remarkable success in the ICT sub-sector (subscription to mobile telephony and the internet with a large international bandwidth). East Africa also recorded a strong result (1.22 points) thanks to a strong performance in the water and sanitation sector. Progress in the southern subregion has slowed, with it occupying the penultimate position in terms of index variation (0.79 points).

During the period studied, electricity production did not increase in all subregions of the continent. A significant drop was even recorded in the Southern subregion.

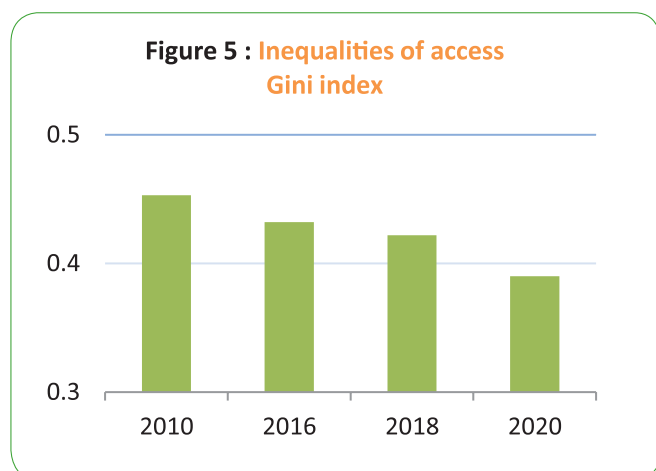
The methodology for the collection of data related for the four components is presented in Annex C.

Inequalities of access to infrastructure services

African populations, particularly rural populations, face difficulties in mobility and access to various infrastructure services. The importance of access to basic infrastructure for the well-being of populations is well established and is articulated in the Bank's High 5s Agenda, namely to "Improve the Quality of Life for the People of Africa." A major challenge that countries face is how to meet the increased demand for these basic services while ensuring equal access.

In order to quantify and measure the extent of inequalities in access to different services, the Inequality factor is expressed in Table 1 by the Gini coefficient: the value 0 indicates perfect equality of access to infrastructure services, while the value 1 indicates extreme inequality.

Between 2010 and 2020, inequality in access registered a significant downward trend over a relatively short period. The Gini coefficient dropped to 0.411 in 2020, compared to 0.437 in 2016 and 0.453 in 2010 (see Figure 5)



The digital divide describes inequalities in access to ICT, their use and their impact. The digital divide between the countries seems to be narrowing. The Gini index fell from 0.432 in 2016 to 0.390 in 2020

The quintile ratio measures the inequality of distribution. It calculates the average index of 20% of the countries (weighted by their population) with the highest score (the last quintile) compared to the average index in the 20% of countries with the lowest level (the first quintile). This ratio shows a reduction in inequalities between African countries, the figure having declined from 9.3 in 2018 to 8.7 in 2020.

Table 1: AIDI 2020 – Quintile Classification

	2018	2019	2020
Lower quintile	8.12	8.27	8.82
Second quintile	13.85	14.36	14.93
Third quintile	21.52	21.79	22.24
Fourth quintile	26.75	26.33	26.96
Upper quintile	75.23	75.98	77.10
Q5/Q1	9.3	9.2	8.7

Conclusions

In general, all countries improved their scores in the AIDI 2020, 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 subsector and, to a lesser extent, in water and sanitation.

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

Finally, although the inequalities of access to infrastructure services among countries seem to have reduced over the past few years, the difference between the top ten countries and those at the bottom remains significant and progress toward narrowing the gap remains very slow.

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Annexes

ANNEX A

Table A.1: The Composite Africa Infrastructure Development Index 2018–2020

Rank	Country	2018	Rank	Country	2019	Rank	Country	2020
1	Seychelles	94.324	1	Seychelles	94.970	1	Seychelles	96.732
2	Egypt	85.847	2	Egypt	87.230	2	Egypt	88.390
3	Libya	81.413	3	Libya	81.892	3	Libya	82.966
4	South Africa	78.527	4	South Africa	78.430	4	South Africa	79.344
5	Mauritius	76.787	5	Mauritius	77.500	5	Mauritius	79.115
6	Tunisia	68.982	6	Tunisia	69.302	6	Tunisia	70.571
7	Morocco	64.884	7	Morocco	64.872	7	Morocco	66.527
8	Algeria	55.793	8	Algeria	57.077	8	Algeria	57.867
9	Cabo Verde	47.955	9	Cabo Verde	47.958	9	Cabo Verde	48.882
10	Botswana	36.793	10	Botswana	36.956	10	Botswana	37.500
11	Gabon	30.670	11	Gabon	31.171	11	Gabon	31.287
12	Ghana	28.835	12	Ghana	29.514	12	Ghana	30.126
13	Namibia	28.652	13	Gambia	28.973	13	Namibia	29.984
14	Gambia	28.612	14	Namibia	28.960	14	Gambia	29.537
15	Sao Tome and Principe	27.143	15	Senegal	28.301	15	Senegal	29.216
16	Senegal	25.965	16	Sao Tome and Principe	27.137	16	Eswatini	28.209
17	Eswatini	25.764	17	Eswatini	27.105	17	Sao Tome and Principe	27.542
18	Kenya	25.604	18	Kenya	25.924	18	Kenya	26.093
19	Zimbabwe	24.518	19	Zimbabwe	24.423	19	Zimbabwe	25.539
20	Djibouti	24.461	20	Djibouti	23.898	20	Djibouti	24.649
21	Comoros	23.500	21	Comoros	23.621	21	Cote d'Ivoire	24.177
22	Nigeria	22.365	22	Cote d'Ivoire	23.275	22	Comoros	24.126
23	Zambia	22.289	23	Zambia	23.220	23	Zambia	23.968
24	Cote d'Ivoire	21.960	24	Nigeria	22.763	24	Nigeria	23.266
25	Malawi	21.018	25	Uganda	21.171	25	Uganda	21.969
26	Rwanda	20.768	26	Rwanda	20.974	26	Malawi	21.794
27	Uganda	20.622	27	Malawi	20.812	27	Rwanda	21.698
28	Cameroon	19.813	28	Cameroon	20.355	28	Cameroon	20.687
29	Angola	19.038	29	Equatorial Guinea	18.896	29	Angola	20.069
30	Equatorial Guinea	18.215	30	Angola	18.884	30	Equatorial Guinea	19.326
31	Congo, Rep.	17.531	31	Congo, Rep.	17.693	31	Burkina Faso	18.522
32	Burkina Faso	17.055	32	Burkina Faso	17.514	32	Congo, Rep.	18.124
33	Benin	16.228	33	Sudan	16.509	33	Mauritania	17.411
34	Mauritania	16.050	34	Lesotho	16.443	34	Sudan	17.159
35	Lesotho	16.008	35	Mauritania	16.246	35	Guinea	16.714
36	Mali	15.948	36	Benin	16.071	36	Mali	16.698
37	Sudan	15.404	37	Guinea	15.737	37	Benin	16.527
38	Burundi	15.112	38	Mali	15.598	38	Lesotho	16.334
39	Guinea	14.789	39	Burundi	15.224	39	Burundi	15.926
40	Liberia	14.485	40	Liberia	14.220	40	Tanzania	14.891
41	Guinea-Bissau	13.536	41	Tanzania	14.110	41	Liberia	14.529
42	Togo	12.971	42	Guinea-Bissau	13.523	42	Guinea-Bissau	14.145
43	Tanzania	12.543	43	Togo	13.297	43	Togo	14.069
44	Mozambique	12.495	44	Central African Republic	11.940	44	Mozambique	12.601
45	Central African Republic	11.951	45	Mozambique	11.885	45	Central African Republic	12.268
46	Madagascar	10.734	46	Sierra Leone	10.747	46	Sierra Leone	11.515
47	Sierra Leone	9.943	47	Madagascar	10.410	47	Madagascar	11.286
48	Ethiopia	9.699	48	Ethiopia	10.125	48	Ethiopia	10.493
49	Eritrea	8.217	49	Eritrea	8.192	49	Eritrea	8.765
50	Congo, Dem. Rep.	8.148	50	Congo, Dem. Rep.	7.975	50	Congo, Dem. Rep.	8.644
51	Chad	7.239	51	Chad	7.515	51	Chad	7.838
52	Niger	5.508	52	Niger	5.582	52	Niger	6.459
53	South Sudan	4.603	53	South Sudan	4.584	53	South Sudan	5.278
54	Somalia	3.362	54	Somalia	3.604	54	Somalia	4.532

Table A.2: Electricity Index 2018 – 2020

Rank	Country	2018	Rank	Country	2019	Rank	Country	2020
1	Libya	97.407	1	Libya	93.542	1	Libya	94.774
2	Seychelles	77.393	2	Seychelles	79.066	2	Seychelles	80.734
3	South Africa	76.009	3	South Africa	74.031	3	South Africa	73.893
4	Mauritius	39.800	4	Mauritius	40.155	4	Mauritius	41.219
5	Egypt	33.543	5	Egypt	34.264	5	Egypt	33.950
6	Tunisia	29.000	6	Algeria	29.148	6	Algeria	29.802
7	Gabon	28.874	7	Tunisia	28.904	7	Tunisia	29.007
8	Algeria	28.830	8	Gabon	25.631	8	Gabon	25.762
9	Botswana	23.289	9	Botswana	20.702	9	Botswana	20.557
10	Morocco	14.340	10	Morocco	14.590	10	Morocco	14.894
11	Zambia	14.063	11	Eswatini	13.480	11	Eswatini	13.632
12	Equatorial Guinea	13.790	12	Equatorial Guinea	13.426	12	Equatorial Guinea	13.122
13	Eswatini	13.330	13	Zambia	11.866	13	Zambia	11.671
14	Mozambique	11.729	14	Cabo Verde	11.494	14	Cabo Verde	11.365
15	Zimbabwe	11.518	15	Mozambique	11.172	15	Mozambique	11.068
16	Cabo Verde	11.356	16	Namibia	10.590	16	Namibia	10.566
17	Namibia	11.149	17	Zimbabwe	8.238	17	Zimbabwe	8.472
18	Ghana	6.827	18	Ghana	7.571	18	Ghana	7.744
19	Djibouti	6.587	19	Cote d'Ivoire	7.002	19	Cote d'Ivoire	6.735
20	Cote d'Ivoire	6.134	20	Djibouti	6.645	20	Djibouti	6.711
21	Congo, Rep.	5.901	21	Sudan	6.069	21	Sudan	6.137
22	Angola	5.789	22	Angola	5.936	22	Congo, Rep.	5.914
23	Cameroon	5.682	23	Cameroon	5.83	23	Angola	5.886
24	Sudan	5.633	24	Congo, Rep.	5.815	24	Cameroon	5.829
25	Senegal	4.694	25	Senegal	4.903	25	Senegal	4.818
26	Kenya	3.307	26	Lesotho	3.318	26	Kenya	3.591
27	Lesotho	3.201	27	Kenya	3.261	27	Lesotho	3.438
28	Mauritania	3.165	28	Mauritania	2.93	28	Mauritania	3.006
29	Nigeria	2.838	29	Nigeria	2.716	29	Nigeria	2.721
30	Malawi	2.601	30	Malawi	2.586	30	Malawi	2.560
31	Gambia	2.471	31	Sao Tome and Principe	2.467	31	Sao Tome and Principe	2.522
32	Sao Tome and Principe	2.454	32	Gambia	2.444	32	Gambia	2.423
33	Mali	2.077	33	Mali	2.169	33	Mali	2.272
34	Tanzania	2.016	34	Tanzania	2.133	34	Tanzania	2.115
35	Eritrea	1.970	35	Eritrea	2.024	35	Eritrea	2.066
36	Congo, Dem. Rep.	1.905	36	Congo, Dem. Rep.	1.827	36	Congo, Dem. Rep.	1.956
37	Madagascar	1.786	37	Madagascar	1.797	37	Madagascar	1.890
38	Guinea	1.753	38	Guinea	1.793	38	Guinea	1.834
39	Ethiopia	1.671	39	Ethiopia	1.752	39	Ethiopia	1.773
40	Burkina Faso	1.605	40	Burkina Faso	1.647	40	Burkina Faso	1.702
41	Comoros	1.382	41	Comoros	1.421	41	Guinea-Bissau	1.468
42	Uganda	1.377	42	Guinea-Bissau	1.404	42	Comoros	1.461
43	Guinea-Bissau	1.355	43	Uganda	1.360	43	Uganda	1.344
44	South Sudan	0.844	44	Sierra Leone	0.805	44	Sierra Leone	0.853
45	Sierra Leone	0.763	45	Rwanda	0.716	45	Rwanda	0.706
46	Rwanda	0.727	46	South Sudan	0.620	46	South Sudan	0.625
47	Central African Republic	0.498	47	Togo	0.578	47	Togo	0.573
48	Benin	0.484	48	Central African Republic	0.500	48	Central African Republic	0.500
49	Somalia	0.421	49	Benin	0.489	49	Benin	0.464
50	Niger	0.387	50	Somalia	0.422	50	Somalia	0.422
51	Liberia	0.351	51	Niger	0.367	51	Niger	0.367
52	Chad	0.287	52	Liberia	0.357	52	Liberia	0.363
53	Burundi	0.252	53	Chad	0.281	53	Chad	0.277
54	Togo	0.181	54	Burundi	0.245	54	Burundi	0.240

Table A.3: Transport Index 2018–2020

Rank	Country	2018	Rank	Country	2019	Rank	Country	2020
1	Egypt	52.563	1	Egypt	55.314	1	Egypt	54.868
2	Seychelles	51.812	2	Seychelles	51.666	2	Seychelles	51.888
3	Libya	41.785	3	Libya	41.611	3	Libya	40.416
4	Mauritius	36.736	4	Mauritius	36.619	4	Mauritius	36.695
5	Cabo Verde	26.041	5	Cabo Verde	25.877	5	Botswana	25.759
6	Botswana	24.986	6	Botswana	24.651	6	Cabo Verde	25.652
7	South Africa	23.310	7	South Africa	23.199	7	South Africa	22.597
8	Algeria	18.109	8	Algeria	17.907	8	Namibia	17.611
9	Namibia	17.154	9	Namibia	16.868	9	Algeria	17.600
10	Equatorial Guinea	15.991	10	Equatorial Guinea	15.650	10	Equatorial Guinea	15.673
11	Comoros	14.985	11	Comoros	14.839	11	Comoros	14.783
12	Sao Tome and Principe	14.120	12	Sao Tome and Principe	13.966	12	Sao Tome and Principe	13.545
13	Zimbabwe	11.953	13	Eswatini	11.824	13	Eswatini	13.167
14	Ghana	11.735	14	Ghana	11.636	14	Zimbabwe	12.191
15	Rwanda	11.696	15	Rwanda	11.629	15	Rwanda	11.597
16	Kenya	11.340	16	Zimbabwe	11.385	16	Ghana	11.509
17	Burkina Faso	11.141	17	Burkina Faso	11.062	17	Burkina Faso	11.005
18	Tunisia	10.792	18	Tunisia	10.726	18	Tunisia	10.695
19	Morocco	9.944	19	Kenya	10.615	19	Kenya	10.487
20	Djibouti	9.704	20	Morocco	9.869	20	Morocco	9.723
21	Burundi	8.689	21	Djibouti	9.630	21	Djibouti	9.330
22	Eswatini	8.534	22	Burundi	8.626	22	Burundi	8.660
23	Gambia	7.800	23	Gambia	7.798	23	Gambia	7.632
24	Lesotho	7.251	24	Lesotho	7.207	24	Lesotho	7.301
25	Togo	6.557	25	Zambia	6.821	25	Zambia	6.784
26	Uganda	6.378	26	Uganda	6.483	26	Uganda	6.456
27	Cote d'Ivoire	6.307	27	Cote d'Ivoire	6.252	27	Cote d'Ivoire	6.162
28	Nigeria	5.763	28	Togo	5.927	28	Togo	5.881
29	Guinea-Bissau	5.270	29	Nigeria	5.701	29	Nigeria	5.655
30	Mauritania	5.073	30	Benin	5.227	30	Guinea-Bissau	5.314
31	Zambia	4.933	31	Guinea-Bissau	5.190	31	Benin	5.219
32	Guinea	4.729	32	Mauritania	4.979	32	Mauritania	4.862
33	Benin	4.567	33	Guinea	4.686	33	Guinea	4.755
34	Sierra Leone	4.148	34	Sudan	4.291	34	Sudan	4.338
35	Gabon	3.964	35	Sierra Leone	4.231	35	Angola	4.298
36	Malawi	3.817	36	Gabon	3.870	36	Sierra Leone	4.111
37	Senegal	3.433	37	Malawi	3.767	37	Gabon	3.782
38	Tanzania	3.079	38	Senegal	3.627	38	Malawi	3.770
39	Central African Republic	3.041	39	Tanzania	3.046	39	Senegal	3.654
40	Madagascar	2.996	40	Central African Republic	3.007	40	Central African Republic	3.154
41	Liberia	2.872	41	Madagascar	2.953	41	Tanzania	3.048
42	Cameroon	2.530	42	Liberia	2.942	42	Liberia	2.921
43	Mali	2.492	43	Cameroon	2.760	43	Madagascar	2.914
44	Congo, Rep.	2.350	44	Mali	2.440	44	Cameroon	2.724
45	Ethiopia	2.156	45	Congo, Rep.	2.312	45	Mali	2.405
46	Mozambique	2.123	46	Ethiopia	2.131	46	Congo, Rep.	2.200
47	Somalia	2.064	47	Somalia	2.110	47	Ethiopia	2.093
48	Angola	1.929	48	Mozambique	2.083	48	Mozambique	2.09
49	Niger	1.921	49	Angola	1.890	49	Eritrea	1.959
50	Congo, Dem. Rep.	1.496	50	Niger	1.874	50	Niger	1.827
51	Eritrea	1.458	51	Congo, Dem. Rep.	1.498	51	Somalia	1.747
52	Chad	1.145	52	Eritrea	1.437	52	Congo, Dem. Rep.	1.491
53	Sudan	0.618	53	Chad	1.136	53	Chad	1.128
54	South Sudan	0.003	54	South Sudan	-	54	South Sudan	0.015

Table A.4: ICT Index 2018–2020

Rank	Country	2018	Rank	Country	2019	Rank	Country	2020
1	South Africa	63.445	1	South Africa	67.391	1	South Africa	71.813
2	Seychelles	51.845	2	Mauritius	57.341	2	Mauritius	62.430
3	Mauritius	51.672	3	Seychelles	56.564	3	Seychelles	60.603
4	Morocco	34.912	4	Algeria	38.77	4	Morocco	44.286
5	Tunisia	33.912	5	Morocco	37.968	5	Tunisia	41.850
6	Algeria	32.588	6	Tunisia	37.52	6	Algeria	40.804
7	Cabo Verde	29.508	7	Egypt	33.495	7	Egypt	37.121
8	Egypt	28.493	8	Cabo Verde	31.673	8	Cabo Verde	34.249
9	Botswana	28.446	9	Botswana	31.488	9	Botswana	30.905
10	Gabon	27.509	10	Gabon	31.103	10	Gabon	30.736
11	Libya	23.554	11	Ghana	25.714	11	Cote d'Ivoire	28.934
12	Cote d'Ivoire	21.972	12	Cote d'Ivoire	25.428	12	Namibia	27.103
13	Namibia	21.97	13	Libya	25.189	13	Libya	26.676
14	Ghana	21.744	14	Namibia	24.958	14	Ghana	26.621
15	Kenya	19.627	15	Kenya	21.867	15	Gambia	22.483
16	Gambia	18.398	16	Gambia	20.952	16	Kenya	21.474
17	Sao Tome and Principe	17.426	17	Lesotho	19.391	17	Senegal	21.291
18	Senegal	16.885	18	Senegal	19.258	18	Sao Tome and Principe	19.676
19	Lesotho	16.658	19	Sao Tome and Principe	18.929	19	Zimbabwe	19.543
20	Zimbabwe	15.742	20	Nigeria	17.325	20	Eswatini	18.672
21	Mali	15.671	21	Eswatini	17.208	21	Mali	17.904
22	Nigeria	15.061	22	Zimbabwe	17.096	22	Nigeria	17.877
23	Eswatini	14.797	23	Cameroon	16.621	23	Zambia	17.544
24	Sudan	14.478	24	Tanzania	16.248	24	Sudan	17.283
25	Cameroon	13.906	25	Sudan	15.820	25	Mauritania	17.198
26	Mauritania	13.082	26	Mali	15.788	26	Cameroon	17.061
27	Zambia	12.989	27	Zambia	15.521	27	Lesotho	17.039
28	Benin	12.803	28	Mauritania	14.800	28	Tanzania	16.949
29	Rwanda	12.546	29	Rwanda	14.196	29	Burkina Faso	15.604
30	Congo, Rep.	12.354	30	Congo, Rep.	13.959	30	Rwanda	14.958
31	Mozambique	11.862	31	Burkina Faso	13.18	31	Uganda	14.476
32	Burkina Faso	11.025	32	Uganda	12.931	32	Sierra Leone	13.960
33	Guinea	10.960	33	Benin	12.789	33	Guinea	13.959
34	Equatorial Guinea	10.676	34	Sierra Leone	12.639	34	Benin	13.832
35	Djibouti	10.351	35	Guinea	12.343	35	Congo, Rep.	13.684
36	Uganda	10.296	36	Equatorial Guinea	12.313	36	Togo	13.408
37	Tanzania	10.272	37	Djibouti	12.001	37	Djibouti	13.271
38	Liberia	9.790	38	Togo	11.996	38	Equatorial Guinea	12.944
39	Togo	9.590	39	Mozambique	10.915	39	Mozambique	10.90
40	Sierra Leone	9.397	40	Ethiopia	10.883	40	Guinea-Bissau	10.118
41	Angola	9.179	41	Liberia	9.727	41	Ethiopia	10.115
42	Ethiopia	8.747	42	Angola	9.492	42	Angola	9.934
43	Guinea-Bissau	7.908	43	Comoros	9.167	43	Comoros	9.580
44	Comoros	7.897	44	Guinea-Bissau	8.890	44	Liberia	9.064
45	Malawi	6.218	45	Malawi	7.166	45	Malawi	8.903
46	Burundi	6.201	46	Burundi	7.127	46	Burundi	8.018
47	Congo, Dem. Rep.	5.889	47	Somalia	6.550	47	Niger	7.807
48	Madagascar	5.726	48	Chad	6.255	48	Congo, Dem. Rep.	7.517
49	Somalia	5.435	49	Niger	6.139	49	Madagascar	7.040
50	Niger	5.347	50	Congo, Dem. Rep.	5.785	50	Somalia	7.037
51	Chad	4.894	51	Madagascar	5.157	51	Chad	6.902
52	South Sudan	3.863	52	South Sudan	4.294	52	South Sudan	4.842
53	Central African Republic	3.727	53	Central African Republic	4.104	53	Central African Republic	4.163
54	Eritrea	1.398	54	Eritrea	1.612	54	Eritrea	2.139

Table A.5: Water Supply and Sanitation Index 2018–2020

Rank	Country	2018	Rank	Country	2019	Rank	Country	2020
1	Mauritius	99.788	1	Mauritius	99.790	1	Mauritius	99.793
2	Egypt	98.768	2	Egypt	98.893	2	Egypt	98.896
3	Libya	98.136	3	Libya	98.883	3	Libya	98.876
4	Algeria	97.312	4	Algeria	97.324	4	Algeria	97.378
5	Seychelles	97.070	5	Seychelles	97.049	5	Seychelles	97.028
6	Tunisia	96.266	6	Tunisia	96.766	6	Tunisia	96.935
7	South Africa	91.136	7	South Africa	91.855	7	South Africa	92.569
8	Botswana	89.276	8	Botswana	89.853	8	Botswana	90.460
9	Morocco	88.114	9	Morocco	89.510	9	Morocco	89.618
10	Cabo Verde	86.826	10	Cabo Verde	87.790	10	Cabo Verde	88.654
11	Gabon	84.168	11	Gabon	84.451	11	Gabon	84.653
12	Djibouti	78.413	12	Djibouti	79.141	12	Djibouti	79.894
13	Ghana	76.962	13	Ghana	77.936	13	Ghana	78.992
14	Gambia	75.212	14	Eswatini	76.405	14	Eswatini	76.433
15	Eswatini	75.047	15	Sao Tome and Principe	76.031	15	Sao Tome and Principe	76.408
16	Sao Tome and Principe	74.738	16	Gambia	75.461	16	Gambia	75.748
17	Rwanda	73.206	17	Rwanda	74.415	17	Rwanda	75.697
18	Comoros	71.340	18	Senegal	72.257	18	Senegal	73.567
19	Senegal	70.947	19	Comoros	71.526	19	Comoros	71.708
20	Namibia	68.522	20	Namibia	69.160	20	Namibia	69.794
21	Zimbabwe	67.132	21	Mauritania	67.362	21	Mauritania	69.310
22	Mauritania	65.368	22	Zimbabwe	67.049	22	Congo, Rep.	67.877
23	Burundi	65.136	23	Sudan	66.496	23	Somalia	67.708
24	Congo, Rep.	65.034	24	Congo, Rep.	66.457	24	Mali	67.359
25	Lesotho	64.503	25	Burundi	65.866	25	Zimbabwe	67.007
26	Sudan	64.21	26	Lesotho	65.797	26	Lesotho	66.983
27	Equatorial Guinea	63.853	27	Mali	65.344	27	Sudan	66.796
28	Cote d'Ivoire	63.685	28	Malawi	64.627	28	Burundi	66.597
29	Nigeria	63.413	29	Somalia	64.572	29	Malawi	65.964
30	Mali	63.334	30	Nigeria	64.555	30	Nigeria	65.623
31	Malawi	63.174	31	Equatorial Guinea	64.060	31	Cote d'Ivoire	64.511
32	Cameroon	62.703	32	Cote d'Ivoire	64.042	32	Guinea	64.452
33	Somalia	61.417	33	Cameroon	63.322	33	Equatorial Guinea	64.191
34	Guinea	61.129	34	Guinea	62.755	34	Cameroon	63.669
35	Liberia	59.241	35	Liberia	60.443	35	Liberia	61.645
36	Angola	58.761	36	Angola	59.515	36	Angola	60.216
37	Burkina Faso	56.307	37	Burkina Faso	57.373	37	Burkina Faso	58.469
38	Uganda	55.715	38	Uganda	56.939	38	Uganda	58.210
39	Benin	53.449	39	Benin	54.349	39	Sierra Leone	54.930
40	Kenya	52.748	40	Kenya	53.423	40	Benin	54.593
41	Sierra Leone	51.703	41	Sierra Leone	53.332	41	Kenya	54.148
42	Guinea-Bissau	50.72	42	Guinea-Bissau	52.039	42	Togo	52.912
43	Togo	50.046	43	Togo	51.477	43	Tanzania	52.526
44	Central African Republic	49.195	44	Zambia	49.881	44	Guinea-Bissau	52.346
45	Zambia	48.962	45	Tanzania	49.813	45	Zambia	50.803
46	Tanzania	47.101	46	Central African Republic	49.497	46	Central African Republic	49.590
47	Mozambique	43.328	47	Mozambique	46.269	47	Mozambique	49.227
48	Eritrea	42.422	48	South Sudan	44.097	48	South Sudan	45.900
49	South Sudan	42.215	49	Eritrea	42.856	49	Eritrea	43.042
50	Congo, Dem. Rep.	38.721	50	Congo, Dem. Rep.	39.211	50	Niger	40.332
51	Niger	36.878	51	Niger	38.603	51	Ethiopia	39.738
52	Ethiopia	34.840	52	Ethiopia	37.319	52	Congo, Dem. Rep.	39.514
53	Madagascar	30.974	53	Madagascar	32.316	53	Madagascar	33.702
54	Chad	28.543	54	Chad	28.965	54	Chad	29.386

Annex B

Table B.1: Africa Infrastructure Development Index 2018–2020 by Subregion

Rank	Subregion	2018	Rank	Subregion	2019	Rank	Subregion	2020
1	North Africa	72.961	1	North Africa	74.008	1	North Africa	75.188
2	Southern Africa	35.461	2	Southern Africa	35.505	2	Southern Africa	36.247
3	West Africa	20.467	3	West Africa	20.962	3	West Africa	21.605
4	East Africa	14.607	4	East Africa	15.268	4	East Africa	15.825
5	Central Africa	11.043	5	Central Africa	11.16	5	Central Africa	11.684
	Africa	28.444		Africa	28.997		Africa	29.633

Annex C

Table C.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 (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 habitant.	

III. ICT Composite Index (ICT)	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.	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.
		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 analog and digital cellular systems IMT-2000 (Third Generation, 3G) and 4G subscriptions.
	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>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):</p> <p>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):</p> <p>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. In order to be effective, facilities must be correctly constructed, in addition to being properly maintained.</p>	

Methodology for data collection of the four components of the AIDI

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 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.