

# Infrastructure at schools in South Africa

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# INFRASTRUCTURE AT SCHOOLS IN SOUTH AFRICA

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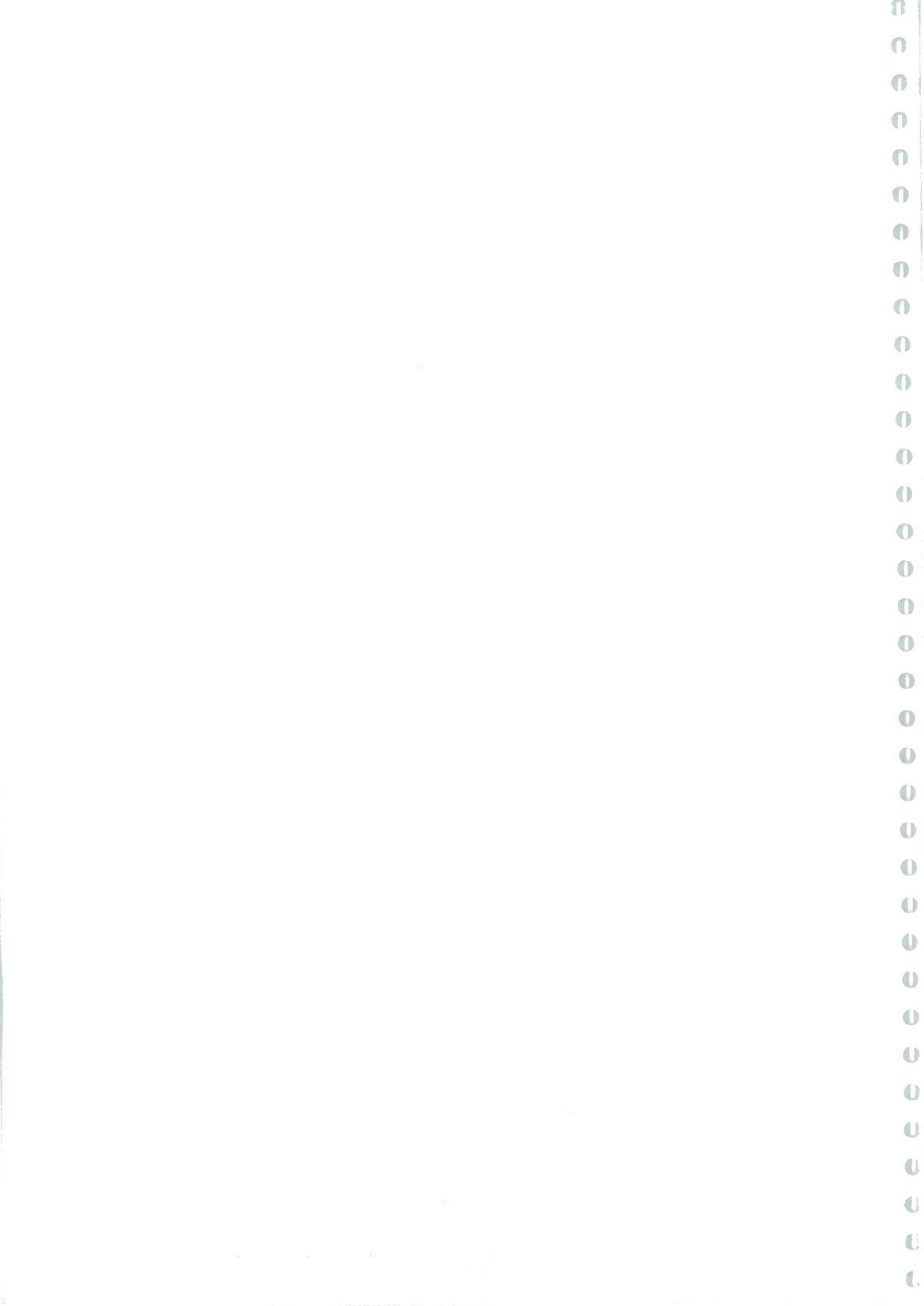
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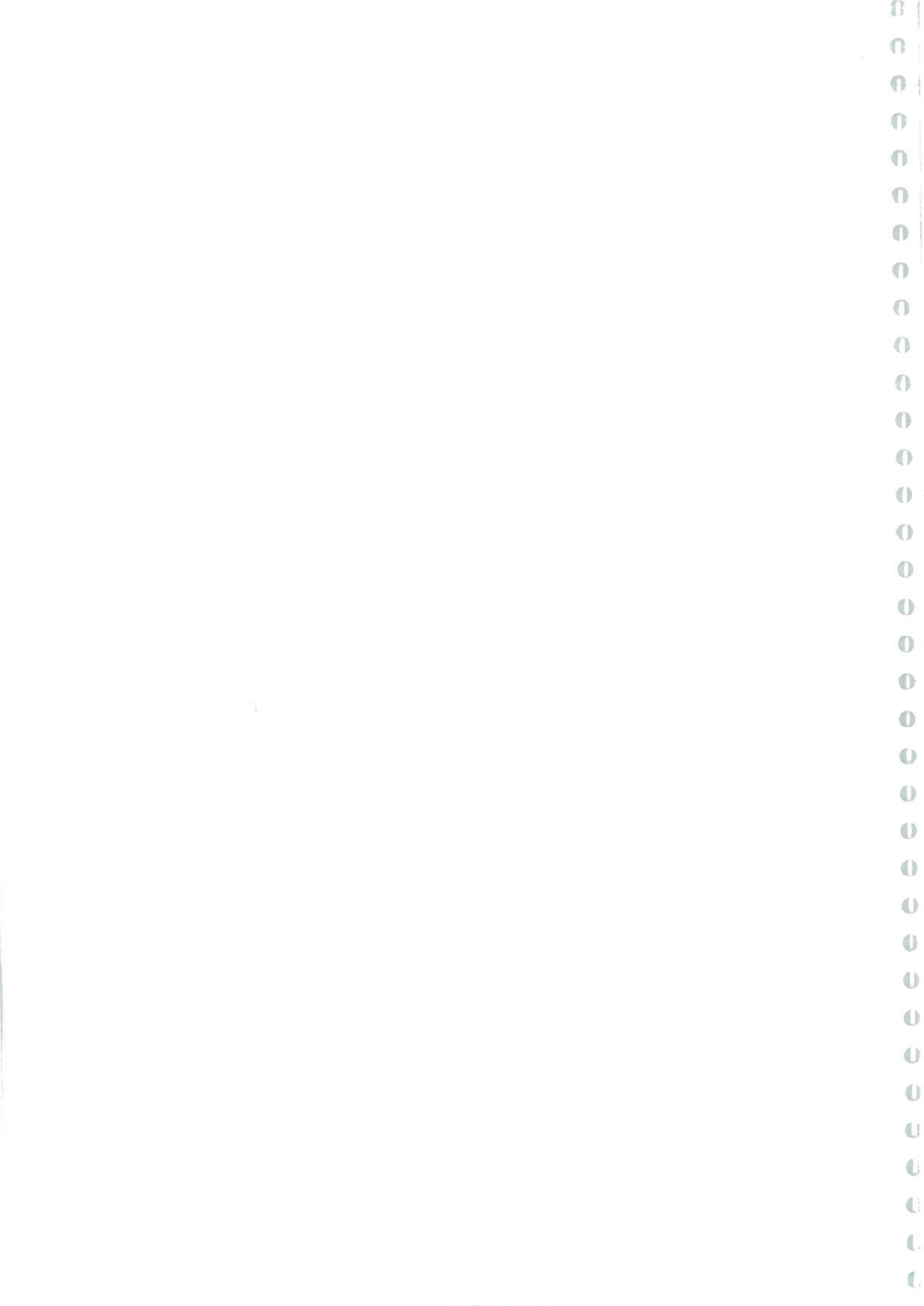
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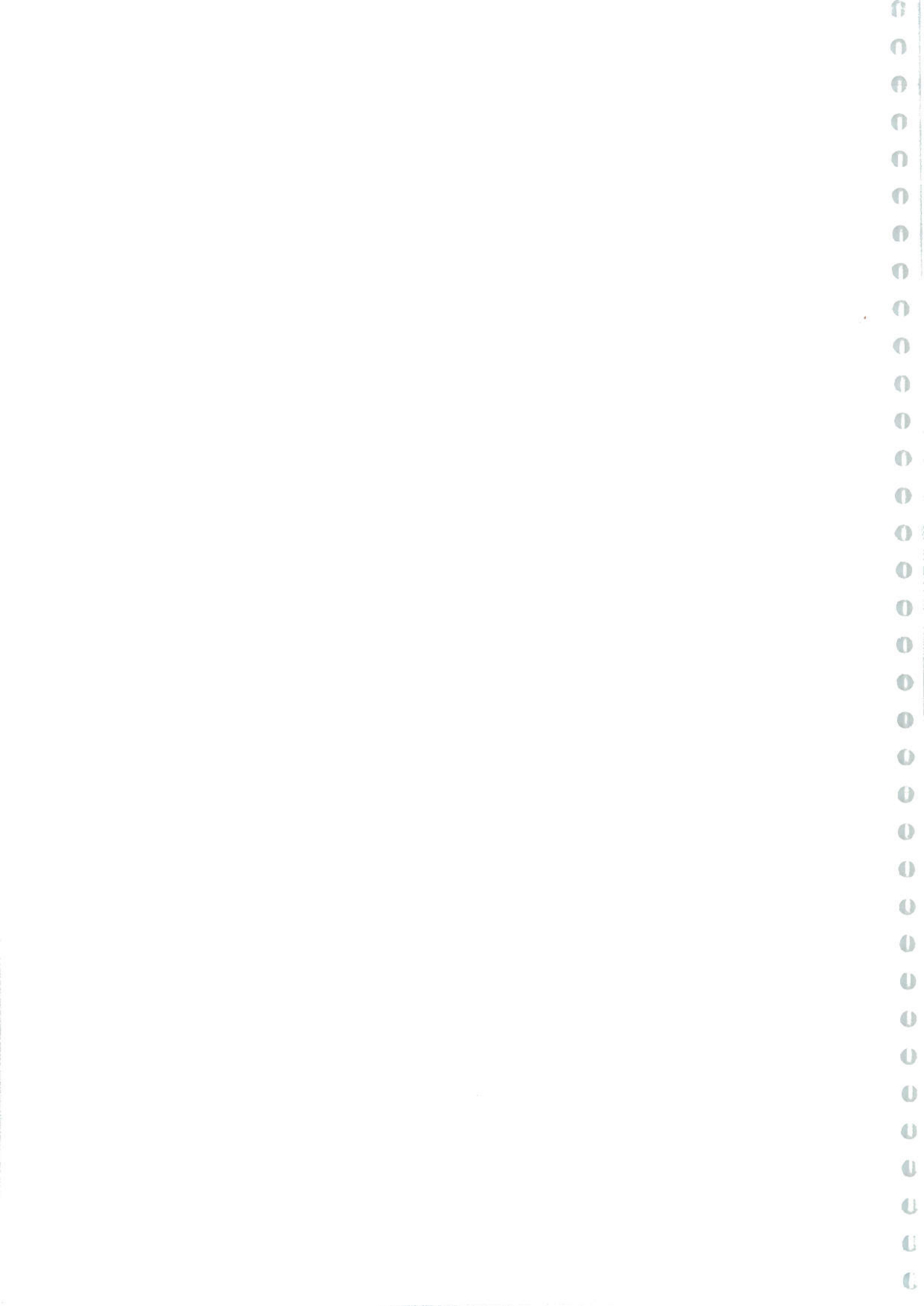
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Abstract





## **1. Events leading to the assignment**

The Development Bank of Southern Africa was recently transformed into an infrastructure finance institution. During the transformation process, it was envisaged that the Bank's future clients could include municipalities, metropolitan and local authorities. However it was not foreseen that Provincial Education Departments would become the DBSA clients, but with nearly 30 000 schools in South Africa providing for more than 12 million learners, education institutions were regarded to be an important beneficiary and consumer of the services provided by local authorities. Every loan granted by the DBSA for infrastructure development would therefore directly influence the schools in the vicinity, especially those without services. Data on the availability of infrastructure at schools seemed to be a crucial variable in the appraisal of financing infrastructure projects at the DBSA.

## **2. Assignment brief**

An assignment: *Database and analysis of infrastructure at schools* (assignment 99305) was registered in 1994 by the then Centre for Policy and Information (CPI) at the DBSA. The assignment was carried forward by the Development Information Business Unit (DIBU). The aim of the assignment was to obtain and analyse information on the infrastructure situation regarding energy, water, sanitation, communication and buildings at schools.

## **3. First data base and collection**

The assignment explored the only source of information in 1994/95, i.e. by collecting data via the ET20 (Education and Training) forms from the schools of the former Department of Education and Training (DET), the former six self-governing states, and the TBVC states for 1993/94. The former DET assisted the assignment leader with this task. A full data base was done which included all schools for Black pupils in South Africa. This data base pointed out huge shortages regarding infrastructure. (E.g. 17 000 of the 25 000 did not have electricity.) This data base was not published but is available from the assignment leader.

This initial data base proved to be outdated because the former departments of education were replaced by the new provincial education departments after the 1994 election.

#### 4. EMIS Steering Committee

Because of the above mentioned data base, the assignment leader was invited in 1995 by the new Department of Education (DoE) to serve on the Steering Committee of the National Education Management Information System (EMIS) investigation. The aim of the EMIS was to develop a new information system for education. This was a positive development because the data needs regarding infrastructure at schools was recognised and the assignment could now be driven within the DoE.

The Steering Committee was involved in extensive policy research regarding national and international education information systems. Several international research visits were sponsored by the Swedish International Development Aid Organisation (SIDA) and supported by the World Bank. The assignment leader, as Chairperson of the Infrastructure and Finance Task Team was in a position to ensure that the collection of infrastructure information at schools would be secured. One of the recommendations of the Steering Committee was that the annual survey at schools would no longer include infrastructural information. The old annual survey form (ET20) was too bulky and the subjective information on infrastructure needs, supplied by principals, was not reliable nor compatible.

A separate survey was therefore required. Such a survey will in future be conducted every 3 to 5 years in order to obtain reliable, comparable and compatible infrastructural information.

#### 5. SRN survey

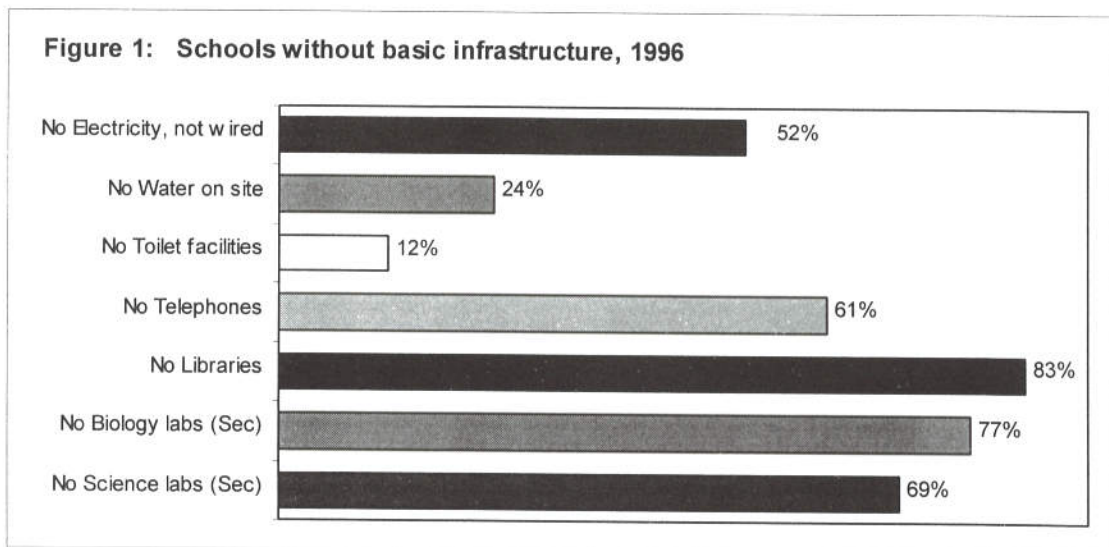
The EMIS Steering Committee recommended that a comprehensive School Register of Needs Survey (SRN) be conducted in 1996. The DoE accepted the recommendation and a tender of R11 million was accepted from a consortium formed by the Human Sciences Research Council, Education Foundation and the Research Institute for Education Planning. The first results were released by the Minister of National Education in August 1997 in a document : *School Register of Needs Survey*, obtainable from the Department of Education in Pretoria. The information will also be available on a Geographical Information System basis. It is currently being mapped at the Education Foundation's Geographical Information (GIS) unit in Durban. For the first time mapping of schools is now possible because the exact geographical positions of the schools by means of Geographical Positioning (GPS) co-ordinates, were taken during the visits.

## 6. Schools without basic infrastructure in SA

Power supply to schools is a basic infrastructure need that is a matter of concern, because without power basic equipment such as photo copiers, fax machines, computers, E-mail and even light globes and heaters cannot operate.

More than half (52%) of the schools are without electricity and are also not wired to receive any form of power supply (14 145 schools). The schools that are wired but not supplied are 1 357 (or 5%). Various reasons are possible for the non-supply, ranging from the distance from the main lines to power cuts because of non-payment of electricity accounts.

Figure 1 and Table 1 provide a summary of the basic infrastructure needs at 27 188 primary, secondary and combined schools in South Africa in 1996.



The availability of water at schools is another cause for concern as nearly one quarter of all schools (24%) are without any water on site. Children need to bring their drinking water from home.

Sanitation is closely linked with water supply especially in the case of toilets with flush systems. 12% of the schools had no toilets, while 85% had either flush systems or pit systems. Of the total number of schools 335 schools are still using the bucket system.

The majority of schools, 16 666, have no access to telephones. These schools can therefore not be linked to any fax or e-mail facilities. Data on cellular phones are not available at this stage.

Libraries and media centres seem to be 'luxury' items at schools as 83% of all schools are without them. This places constraints towards the successful implementation of the new Curriculum 2005 and Outcome Based Education (OBE) where self-study and research play an important role. Most of these schools are, however, primary schools.

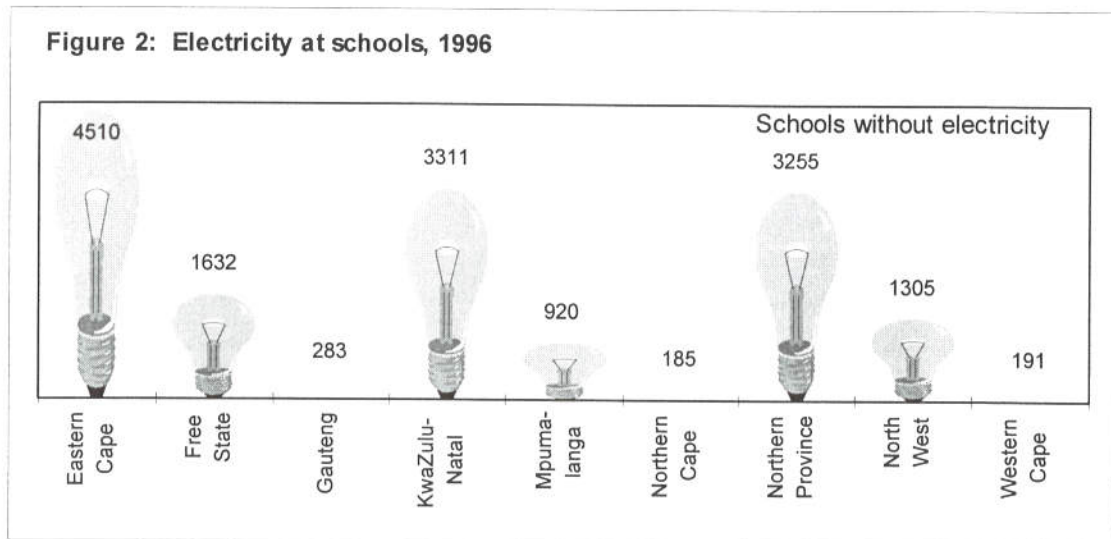
Secondary schools without laboratories cannot present science subjects successfully. Of the total number of 7 900 secondary schools, 77% are without Biology laboratories and 69% without Science laboratories.

<b>TABLE 1: SOUTH AFRICA, INFRASTRUCTURE AT SCHOOLS, 1996</b>		
<b>Type</b>	<b>Number</b>	<b>Percentage</b>
<b>Schools without:</b>		
Electricity and not wired	14145	52%
Water on site	6516	24%
Toilet facilities	3288	12%
Telephones	16666	61%
Libraries	22550	83%
Biology laboratories (Sec Schools)	6121	77%
Science laboratories (Sec Schools)	5471	69%
<b>Building conditions:</b>		
Not suitable for education	1713	6%
Major repairs	3090	11%
Minor repairs	10785	40%
Good or excellent	11095	41%
Awaiting verification	505	2%
Total SA	27188	100%
Source: Dept of Ed School Registrar of Needs Survey, EduSource, 1997		

The conditions of the school buildings are also important regarding future infrastructure needs. About one out of every 20 schools are not suitable for education at all, while 11% are in need of major repairs. In some cases schools were totally demolished during vacations and the building materials used for housing by squatters. More than 80% of the schools in South Africa are however in excellent, to good condition, or in need of minor repairs.

## 7. Energy availability per province

The School Register of Needs Questionnaire included *under Power and Energy Supply* five possibilities as presented in Table 2. They are Wired and Supplied 41%; Generator 1%; Other source like solar panels 1%, wired but not supplied 5%, and not wired and without power 52%.



The province that seems to be worst off is the Eastern Cape with 73% of the schools not wired. The total lack of power supply is most prominent in the Northern Province (79%), the Eastern Cape (77%) and KwaZulu-Natal (61%).

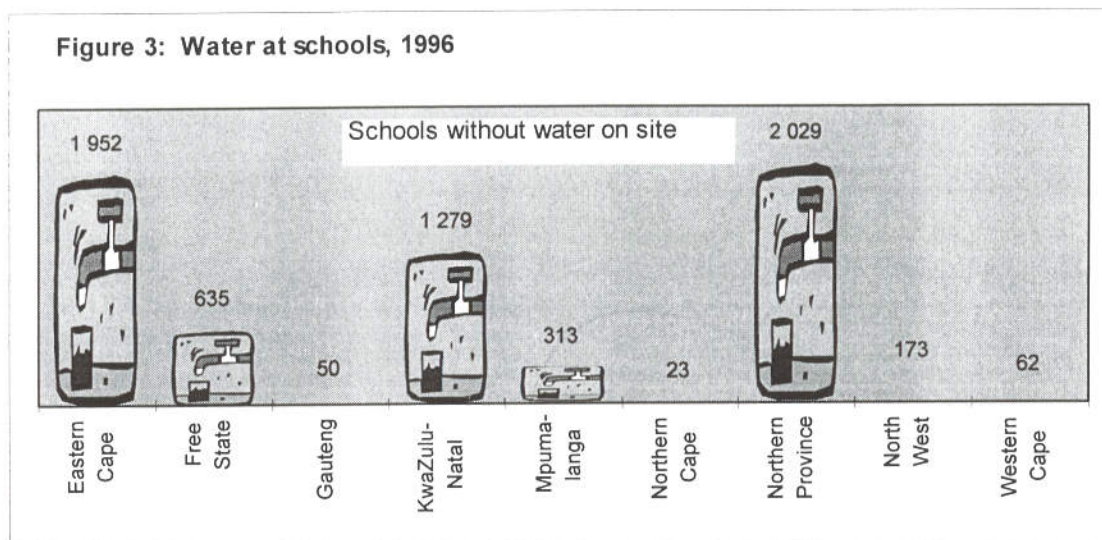
**TABLE 2:  
ELECTRICITY AVAILABILITY AT SCHOOLS PER PROVINCE, 1996**

Province	Wired and supplied	%	Generator	%	Other energy source	%	Wired and not supplied	%	Not wired	%	Awaiting verification	%	Total
Eastern Cape	1086	18	60	1	195	3	211	4	4299	73	29	0	5880
Free State	1200	42	22	1	4	0	62	2	1570	54	23	1	2881
Gauteng	1934	87	2	0	1	0	77	3	206	9	13	1	2233
KwaZulu-Natal	2025	37	28	1	26	0	234	4	3077	57	19	0	5409
Mpumalanga	965	51	8	0	2	0	216	11	704	37	12	1	1907
Northern Cape	409	78	7	1	10	2	99	2	86	16	5	1	526
Northern Province	866	21	4	0	14	0	362	9	2893	69	31	1	4170
North West	1006	42	20	1	56	2	169	7	1136	47	25	1	2412
Western Cape	1557	88	9	1	2	0	17	1	174	10	11	1	1770
<b>Total SA</b>	<b>11048</b>	<b>41</b>	<b>160</b>	<b>1</b>	<b>310</b>	<b>1</b>	<b>1447</b>	<b>5</b>	<b>14145</b>	<b>52</b>	<b>168</b>	<b>1</b>	<b>27188</b>

Source: Dept of Ed School Register of Needs Survey, EduSource, 1997

## 8. Water availability per Province

The three categories given are where water is available indoors or on site, or from other sources within walking distance from site, and where no water is available near the site or within walking distance from schools.



More than 10% of schools get their water from rivers or dams, 19% from rainwater tanks, 22% from bore holes, and 47% from piped reservoirs. Nearly one quarter of all schools have no water on site or within walking distance. Of the 73% schools with water on or near site, 8% make use of a communal tap, 41% have water on site and 25% have piped water indoors.

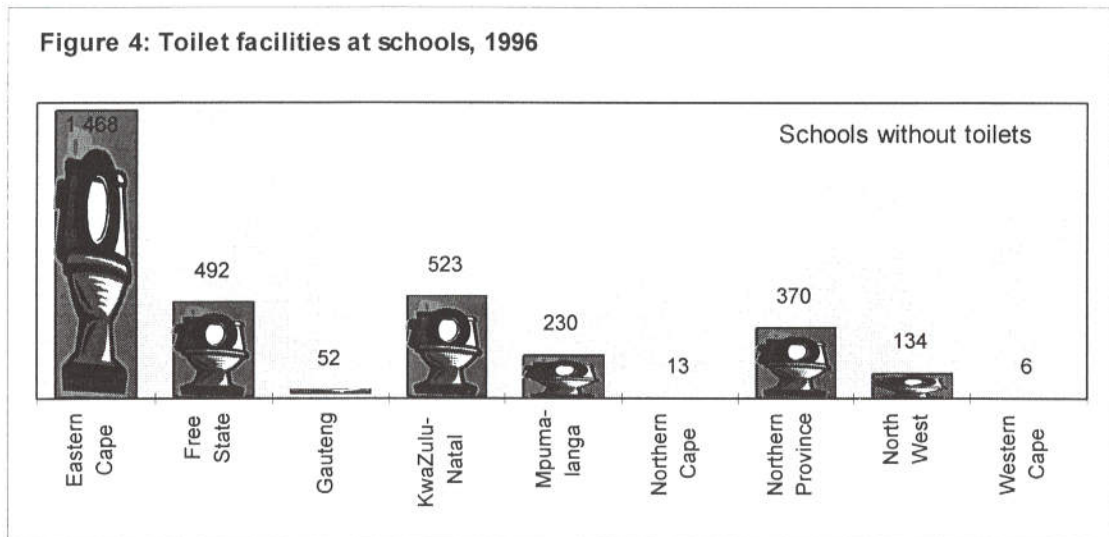
**TABLE 3:  
WATER AVAILABILITY AT SCHOOLS PER PROVINCE, 1996**

Province	Indoors or on site	%	No water on site	%	Awaiting verification	%	Total
Eastern Cape	3747	64	1952	33	181	3	5880
Free State	2207	77	635	22	39	2	2881
Gauteng	2165	97	50	2	18	1	2233
KwaZulu-Natal	3906	72	1279	24	224	4	5409
Mpumalanga	1550	81	313	16	44	3	1907
Northern Cape	491	94	23	4	12	2	526
Northern Province	2055	49	2029	49	86	2	4170
North West	2177	91	173	7	62	3	2412
Western Cape	1694	96	62	3	14	1	1770
<b>Total SA</b>	<b>19992</b>	<b>73</b>	<b>6516</b>	<b>24</b>	<b>680</b>	<b>3</b>	<b>27188</b>

Source: Dept of Ed School Registrar of Needs Survey, EduSource, 1997

## 9. Sanitation situation per province

Successful sanitation is directly linked to water availability, especially with regard to flush systems. An alarming fact is that one quarter of all schools in the Eastern Cape have no toilet facilities. This is a primary health risk in terms of diseases such as diarrhoea, parasitic infections such as round worm, whip worm and tape worm. These situations are also hazardous to the agricultural sector where animals are infected by these parasites.



Taking the norm that one toilet should be provided for every 20 learners KwaZulu-Natal has a shortage of 66 785, Gauteng 24 937, Mpumalanga 23 130, North West 22 048, Free State 16 436, Western Cape 15 639, and Northern Cape 3 475 toilets.

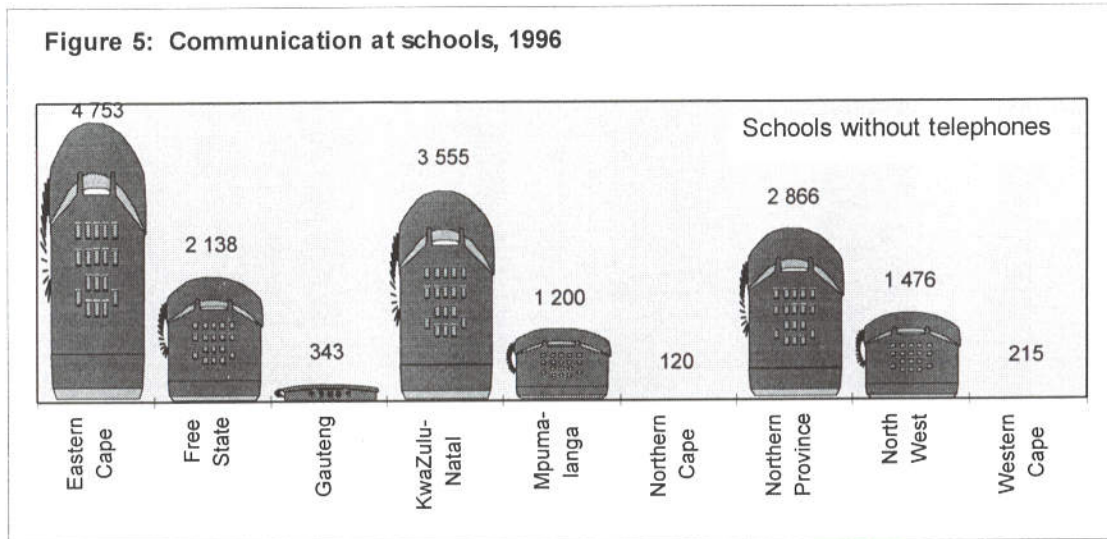
**TABLE 4:  
NUMBER OF SCHOOLS WITH TOILET FACILITIES PER PROVINCE, 1996**

Province	With*	%	Bucket system	%	Without	%	Awaiting verification	%	Total
Eastern Cape	4299	73	66	1	1468	25	47	1	5880
Free State	2329	80	12	0	492	17	48	2	2881
Gauteng	2150	96	3	0	52	2	28	1	2233
KwaZulu-Natal	4777	87	27	0	523	10	82	2	5409
Mpumalanga	1650	88	8	0	230	12	19	1	1907
Northern Cape	465	89	41	8	13	2	7	1	526
Northern Province	3657	88	10	0	370	9	133	3	4170
North West	2210	92	19	1	134	6	49	2	2412
Western Cape	1604	90	149	8	6	0	11	1	1770
<b>Total SA</b>	<b>23141</b>	<b>85</b>	<b>335</b>	<b>1</b>	<b>3288</b>	<b>12</b>	<b>424</b>	<b>2</b>	<b>27188</b>

\*) The types of toilets included here are: flush system to main sewer, flush system to septic tank, ventilated improved pit, and pit latrine  
Source: Dept of Ed School Registrar of Needs Survey, EduSource, 1997

## 10. Telecommunication situation per province

Communication between schools and head offices is extremely time consuming without telecommunication. The questions on the questionnaire included telephones, 2-way radios, Cellular phone, Fax, Modem, None. At the moment only the results regarding telephones are available.



In the Eastern Cape more than 80% of schools have no telephones, followed by Free State 74% and Northern Province 69% (Please refer to Table 5). Most of the schools in Gauteng and the Western Cape have telephones. Possible reasons for not having phones are the distances involved, affordability, and non-payment of telephone bills.

**TABLE 5:  
NUMBER OF SCHOOLS WITH TELEPHONES PER PROVINCE, 1996**

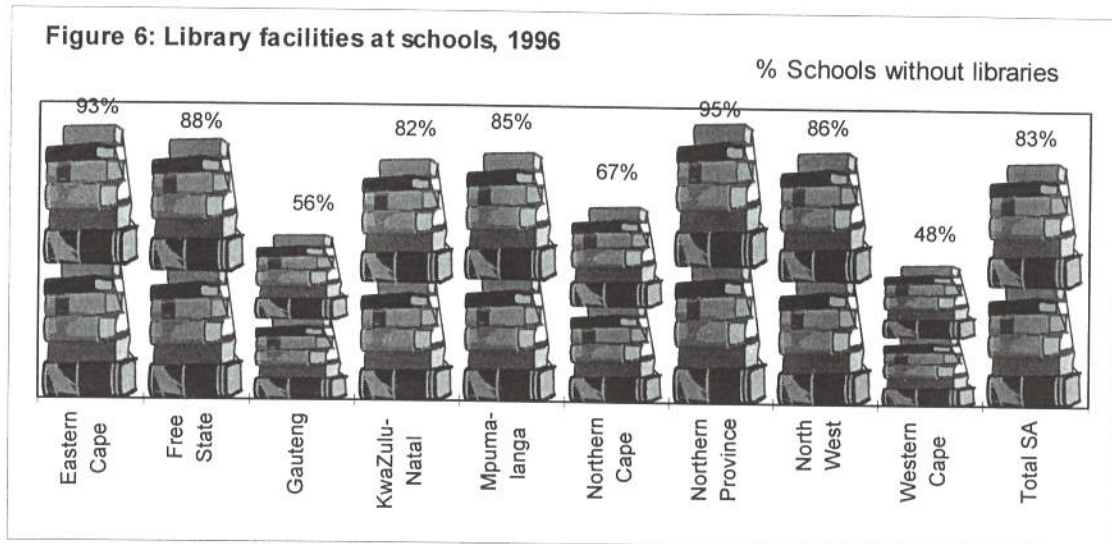
Province	Total schools	With telep.	%	Without telep.	%	Awaiting verif.	%
Eastern Cape	5880	1090	19	4753	81	37	1
Free State	2881	723	25	2138	74	20	1
Gauteng	2233	1883	84	343	15	7	0
KwaZulu-Natal	5409	1840	34	3555	66	14	0
Mpumalanga	1907	702	37	1200	63	5	0
Northern Cape	526	398	76	120	23	8	2
Northern Province	4170	1285	31	2866	69	19	0
North West	2412	860	36	1476	61	76	3
Western Cape	1770	1547	87	215	12	8	0
<b>Total SA</b>	<b>27188</b>	<b>10328</b>	<b>38</b>	<b>16666</b>	<b>61</b>	<b>194</b>	<b>1</b>

Source: Dept of Ed School Registrar of Needs Survey, EduSource, 1997



## 11. Library situation per province

Only a few schools, mainly secondary schools have libraries or media centres in South Africa (17%). A wide variation exists between the availability of libraries at schools per province according to Table 6.



When planning for these facilities the size and level of schools without libraries should be taken into account. For example, although 95% of schools in the Northern Province are without libraries many of these schools are small farm schools with one or two classes catering for the lower primary grades.

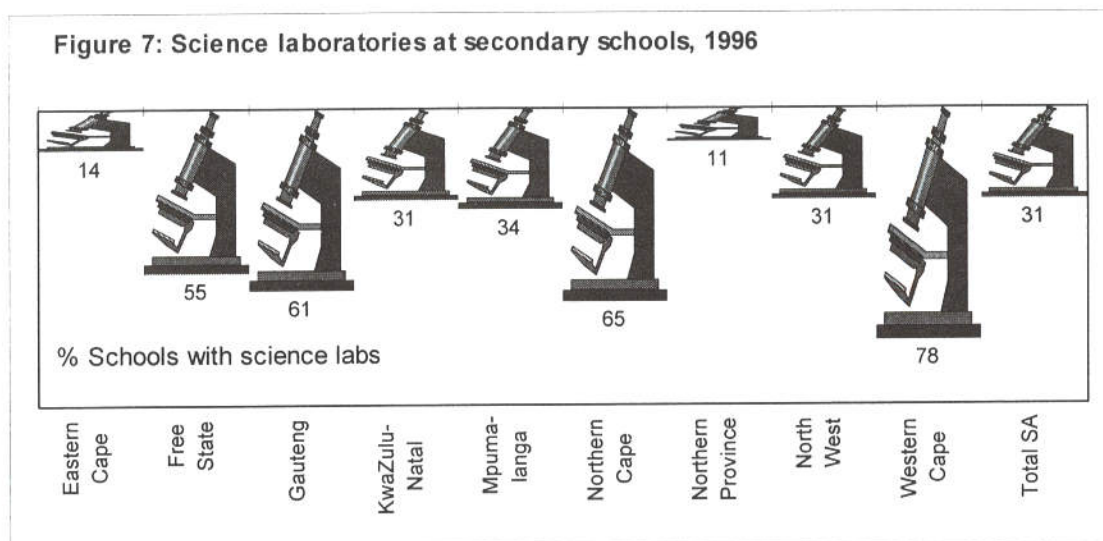
**TABLE 6:  
NUMBER OF SCHOOLS WITH LIBRARY FACILITIES PER PROVINCE, 1996**

Province	Total	Number with libraries	% of total
Eastern Cape	5880	433	7
Free State	2881	341	12
Gauteng	2233	983	44
KwaZulu-Natal	5409	955	18
Mpumalanga	1907	290	15
Northern Cape	526	175	33
Northern Province	4170	205	5
North West	2412	340	14
Western Cape	1770	916	52
<b>Total SA</b>	<b>27188</b>	<b>4638</b>	<b>17</b>

Source: Dept of Ed School Registrar of Needs Survey, EduSource, 1997

## 12. Laboratory situation per province

The majority of the secondary schools in five of the provinces have no laboratories.



Although Biology can be presented with fewer laboratory facilities, it is difficult and even impossible to present Physical Science without a laboratory. Many more learners therefore take Biology as a subject than those taking Physical Science. Lack of laboratories has had a direct influence on the subject choice of learners. This is the main reason why so few learners pass grade 12 with science.

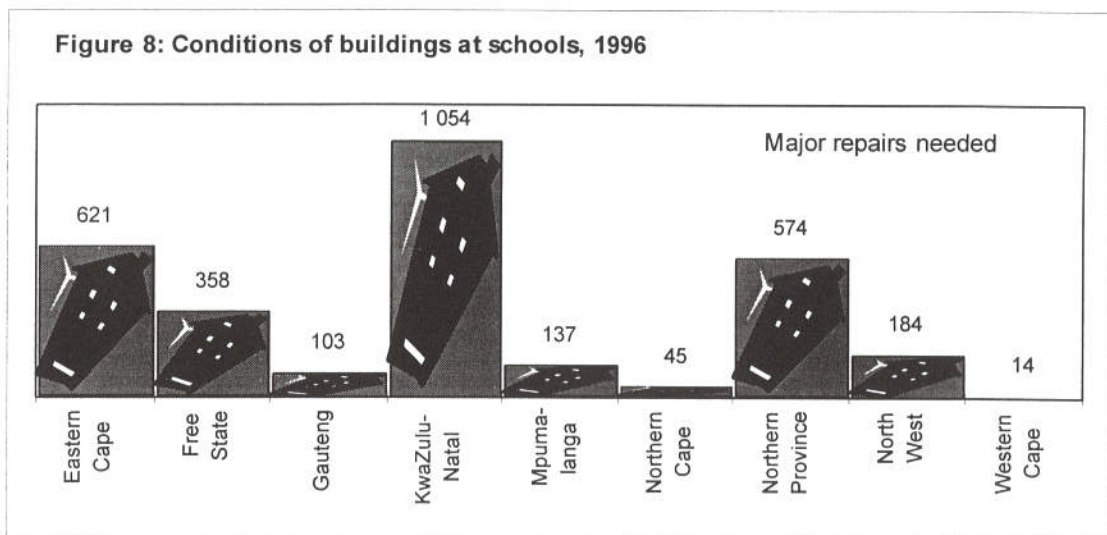
**TABLE 7:  
NUMBER OF SECONDARY SCHOOLS WITH LABORATORIES PER PROVINCE, 1996**

Province	Total	Number with biology laboratories	%	Number with science laboratories	%
Eastern Cape	1965	168	8	272	14
Free State	437	177	41	242	55
Gauteng	763	411	54	463	61
KwaZulu-Natal	1499	334	22	471	31
Mpumalanga	479	103	22	164	34
Northern Cape	130	80	62	84	65
Northern Province	1442	83	6	164	11
North West	752	145	19	232	31
Western Cape	433	278	64	337	78
<b>Total SA</b>	<b>7900</b>	<b>1779</b>	<b>23</b>	<b>2429</b>	<b>31</b>

Source: Dept of Ed School Registrar of Needs Survey, EduSource, 1997

### 13. Building conditions per province

The condition of school buildings, vary largely per province. In the Western Cape, nearly 80% of all schools are in good or excellent condition, while 27% of the schools in the Northern Province are not suitable for education. Of the 1 713 schools not suitable for education, (and beyond repair), 1 127 schools are in the Northern Province.



The size of the schools and the number of learners involved were not given in this first round of results published by the School Register of Needs Survey. Hopefully many of the schools not suitable for education or those in need of major repairs are smaller farm schools.

**TABLE 8:  
CONDITION OF SCHOOL BUILDINGS PER PROVINCE, 1996**

Province	Not suitable for education	%	Major repairs	%	Minor repairs	%	Good/Excellent	%	Awaiting verifi.	%	Total
Eastern Cape	214	2	621	11	2579	44	2276	39	190	3	5880
Free State	100	3	358	13	1319	46	1072	37	32	1	2881
Gauteng	20	1	103	5	800	36	1283	57	27	1	2233
KwaZulu-Natal	180	3	1054	20	2543	47	1556	29	76	1	5409
Mpumalanga	20	1	137	7	950	50	775	41	25	1	1907
Northern Cape	11	2	45	9	254	48	209	40	7	1	526
Northern Province	1127	27	574	14	1004	24	1386	33	79	2	4170
North West	40	2	184	8	996	41	1142	47	50	2	2412
Western Cape	1	0	14	1	340	19	1396	79	19	1	1770
<b>Total SA</b>	<b>1713</b>	<b>6</b>	<b>3090</b>	<b>11</b>	<b>10785</b>	<b>40</b>	<b>11095</b>	<b>41</b>	<b>505</b>	<b>2</b>	<b>27188</b>

Source: Dept of Ed School Registrar of Needs Survey, EduSource, 1997

## 14. Conclusions and policy implications for DBSA

Development in general and economic development specifically, are hampered by the lack of infrastructure at schools. The bad examination results are proof of inadequate facilities in which schooling takes place. The output from and the outcome of the education system cannot be favourable if the process is inferior. The successful implementation of the new Curriculum 2005 and the Outcomes based education (OBE) is dependent on the overall situation at schools including the availability of infrastructure. The size and growth in learner enrolment together with the lack of infrastructure at schools will in future hamper the success of education.

The DBSA should ensure that infrastructure planning is co-ordinated between the different departments and local authorities and DBSA projects. With nearly 30 000 schools in South Africa, every local authority must focus on accurate planning, taking into consideration their overall needs, including infrastructure needs of the schools in their areas. An education impact assessment could be done during the appraisal phase for various DBSA projects with the education data now available.

Affordability of certain infrastructure services is an important aspect to take into consideration. The provincial departments of education together with the school boards run by the parents and the community are responsible for the payment of most of these bills. The non-payment of these bills by schools can have an extremely negative influence on the financial situation of local authorities.

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## **ABSTRACT:**

### **INFRASTRUCTURE AT SCHOOLS IN SOUTH AFRICA**

By Dr Tobie Verwey

This publication provides a summary of the basic infrastructure needs at more than 27 000 schools in South Africa in 1996. The database is part of the School Register of Needs Survey of the Department of Education. As DBSA is an infrastructure finance institution, information on infrastructure at schools is important. Education impact assessments can now be done during the appraisal phase of DBSA projects.

Economic development and the success of the new Curriculum 2005 and OBE are hampered by the lack of infrastructure at schools. Libraries and media centres seem to be “luxury” facilities as 83% of all schools do not have these facilities. The following facilities are also not available, namely, 77% of secondary schools are without Biology laboratories and 69% without Science laboratories, 12% of all schools have no toilets, 61% have no access to telephones, and 52% are without electricity. Some children need to bring their drinking water from home because 24% of all schools are without any water on site.

