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Rationalising micro, multigrade, & under-subscribed schools in South Africa: A pathway to fiscal efficiency and educational equity

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CONTENTS

1. EXECUTIVE SUMMARY

South Africa's fiscal challenges and the imperative to improve educational outcomes are renewing interest in reducing the number of small, multigrade, and under-subscribed schools. At present, 23% of all schools are classified as multigrade—despite serving only 5% of the nation's learners. Yet, they command a disproportionate share of operational, maintenance, and leadership costs.

Spatial analyses in this report suggest that approximately 2 400 small, multigrade schools may lie within reasonable "walkable" distances of neighbouring schools, indicating potential consolidation with minimal disruption to learners' access. Rationalisation could free up financial and human resources—perhaps especially principals' posts and fixed-cost budgets—for reinvestment into more robust teaching and learning inputs. Nonetheless, the process must be carried out judiciously. Rural communities often consider local schools as communal hubs, while poor infrastructure, inadequate learner transport, and educator redeployment challenges could lead to deteriorating learning outcomes or disenfranchisement if not addressed.

Overall, when accompanied by community engagement, reliable learner transport or boarding options, and sufficient support for receiving schools, rationalisation can simultaneously advance fiscal efficiency and enhance educational quality. By redirecting resources from duplicated administrative roles to core instructional activities, small school closures or mergers offer a strategic opportunity to strengthen South Africa's education system.

2. INTRODUCTION

Facing severe fiscal constraints, several Provincial Departments of Education are planning substantial educator rationalisations (Maynier 2024). This note investigates a promising pathway to reduce the wage bill while preserving, or potentially enhancing, learning outcomes: reducing the number of small, multigrade, and under-subscribed schools. Over the past two decades, several provinces have made strides in closing such schools, yet substantial scope remains for further rationalisation. A multigrade school is defined as one in which multiple grades of learners share a single classroom, thereby preventing educators from teaching at the appropriate grade level to all learners. This prevents grouping learners by assessed learning level (or grade) which is widely regarded as pedagogically indispensable (Banerjee et al. 2016).

Small, multigrade and undersubscribed schools impose additional costs beyond pedagogical concerns, including inefficiencies in human resourcing, infrastructure, logistics, and broader regulatory burdens. Such schools are generally associated with higher fixed expenditures per learner, including principals' salaries, while also lacking the scope for subject specialist teaching or economies of scale in procurement. Provinces with a large number of small schools face added financial strain, diverting resources from potentially more equitable or effective investments in expanding larger institutions. There are also considerable logistical complications: the "last-mile problem" in delivering textbooks, school meals, and other essentials is particularly severe when many small, remote schools must be reached.

This note also emphasises that rationalisation efforts must be approached with caution. Communities often rely on local schools not merely as education providers, but as focal points for social, cultural, and administrative activities, especially in rural or marginalised settings. Moreover, key risks such as inadequate learner transport, poor road infrastructure, and reluctance among educators to relocate can, if unaddressed, undermine attempts to close or merge small schools. Decisions that appear cost-effective at a macro level could exacerbate local feelings of neglect or disenfranchisement unless stakeholders are meaningfully consulted and robust support mechanisms are put in place.

The primary challenge in merging or closing schools is ensuring that learners are not subjected to longer travel distances once their nearest school is closed. This paper investigates the feasibility of school closures while maintaining current travel distances for learners. Using spatial analysis, I identify small, multigrade, and undersubscribed schools that could potentially close without increasing learner travel times. The analysis defines each school's catchment area based on a reasonable travel distance for a given mode of travel. For instance, a catchment area for walking might be defined by a circle with a 3.3km radius around a school, encompassing the homes of learners who can reasonably be expected to walk to school. A school is deemed eligible for closure only if its removal does not reduce the total geographic coverage provided by the combined catchment areas of all remaining schools (Gustafsson 2016). This ensures that the current level of accessibility is preserved. Based on this analysis, and acknowledging several important limitations, I identify 2 362 micro and multigrade schools as candidates for closure.

These rationalisation strategies, however, must be deployed carefully, given the many constraints of Provincial Departments of Education and the importance of safeguarding young children's well-being. Although rationalisation cannot be a blanket solution, substantial opportunities exist to reduce duplication of effort while improving learners' educational experiences.

This document is structured as follows. The next section, 'Data', describes the sources of data for the analysis and briefly outlines how various variables of interest are defined and created. 'Descriptive statistics' then overviews key trends in multigrade schools' prevalence, size, and geography. Subsequently, 'Costs of multigrade and small schools' elaborates on pedagogical limitations, economies of scale in education, human resourcing and specialisation, the last-mile problem, infrastructure and maintenance challenges, and regulatory and bureaucratic overhead. This is followed by a detailed discussion of 'Risks and challenges in rationalising small and multigrade schools', covering learner transport, learner housing, schools as community focal points, educator resistance, and capital outlay. The penultimate section, 'Scope for merging schools', examines potential scenarios under which particular micro, multigrade, and under-subscribed schools could be closed without compromising access. Finally, 'Conclusion' summarises the main insights and implications for rationalising small and multigrade schools in South Africa.

3. DATA

The following analysis draws primarily from The Learner Unit Record Information and Tracking System (Lurits). All of the learner level data used originate from Lurits, including the grade of learners which was used to identify the count of unique grades in a school. Lurits also provides variables on class count, learner gender, learner race, and learner age. Most school level data originate from Masterlists: the educator and learner counts, GPS-coordinates, public or independent status, school phase, rurality, and fee-status. Spatial variables where also used, such as the boundaries of provinces and the former homelands, as well as high resolution spatial data such as the travel time to the nearest city which come from Weiss et al. (2020).

As the only variables used to determine whether a school is multigrade are the count of unique grades and the number of educators, there are edge cases in which this leads to classifying a multigrade schools as non-multigrade, necessarily leading to an undercount. This undercount occurs as there are plausibly schools which have multiple educators teaching in one grade for a particularly large cohort, but wherein there are other grades with inadequate numbers of educators. This can also occur when some educators are subject-specific, leading to multigrade teaching, even where there are more educators than grades. This might be particularly problematic for high schools, although subject educators will likely be expected to teach outside their subject in such a situation. It is possible that schools with more grades than educators are platooning—the practice of teaching grades in shifts, one grade after the other. This is unlikely to happen in South Africa as educator working hours are prescribed. As such, if platooning is occurring, educator contact time is likely to be substantially lower. Whether more grades than learners is leading to platooning or multigrade education, both have inherent pedagogical consequences.

4. DESCRIPTIVE STATISTICS

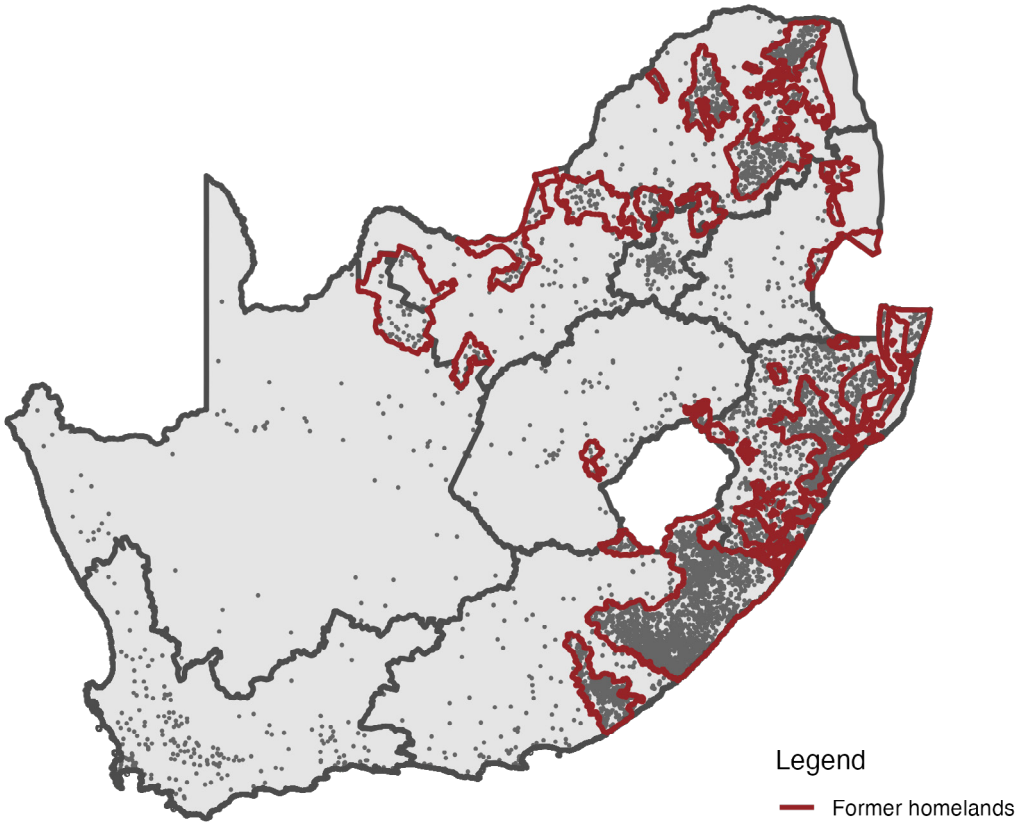

Figure 1: The 5 600 multigrade schools in South Africa (2023)

Of schools composed of fewer than 150 learners, 78% are Multigrade schools. Multigrade schools are slightly more likely to be black (93% v 87%), male (53% v 51%), public (92% v 90%), have a lower learner-educator ratio (26 v 29), and are further from cities (40 vs 71 minutes away) (Weiss et al. 2020). Multigrade schools are substantially more likely to be no fee schools (85% v 62%), rural schools (80 % v 50%), and located in a former homeland (73% v 50%). 88% of multigrade schools are primary schools compared to 56% of non-multigrade schools This might reflect the fact that only primary schools are multigrade schools, or it might reflect that subject educators in high schools increase the headcount of educators, while leaving some grades understaffed. As outlined, this cannot be determined with the available data.

Table 1: Descriptive statistics

Descriptive statistics Comparison of multigrade and non-multigrade schools		
Variable	**Non-multigrade**	**Multigrade**
Avg class count	18	8
Avg educator count	23	5
Avg grade count	7	8
Avg learner count	663	125
Black learners	87%	93%
Gender female	49%	47%

Descriptive statistics Comparison of multigrade and non-multigrade schools		
Variable	**Non-multigrade**	**Multigrade**
Homeland dummy	50%	73%
Learner educator ratio	29	26
No fees school	62%	85%
Overage learners	49%	28%
Phase: combined	10%	9%
Phase: intermediate	2%	1%
Phase: primary	56%	88%
Phase: secondary	32%	2%
Public school	90%	92%
Rural school	50%	80%
School count	19 203	5 601
Travel time to city (min)	40	71
White learners	6%	3%
Date are a combination of LURITS data, Masterlist date, and spatial covariates.		

Comparison of multigrade and non-multigrade schools

The provinces with the largest percentage and count of multigrade schools are the Eastern Cape (45%), KwaZulu-Natal (24%), and Limpopo (21%), see **Table 2**. Nationally, there are ~690 000 learners, in multigrade schools, ~280 000 in the Eastern Cape, ~178 000 in KZN and ~129 000 Limpopo. Only 5% of learners are in multigrade schools compared to 23% of schools being multigrade schools, reflecting the small average school size. Multigrade schools are allocated disproportionately high levels of human resources, with a learner-to-educator ratio of 26 compared to the national average of 29. Despite serving only 5% of learners, these schools account for approximately 6% of educators (around 28 000). How many principals are allocated to each school can only be speculated upon, but it is likely that many of these schools employ a principal on a commensurate pay rung. Assuming each school has one principal, this would entail that 23% of principals are in mulitgrade schools, proportional to the number of schools which are multigrade. As educator pay increases substantially with age and position, this likely has substantial costs to the fiscal sustainability of the education system.[1]

1 Determining the exact salary of principals in small schools is challenging due to limitations in available data and the structure of the pay system. Due to the structure of the Persal, which contains the payment data, it is not possible to directly link salary data to individual schools and their educators, making it difficult to ascertain whether principals in small schools earn more than their educators. The legislation that governs principal salaries, namely the Personnel Administrative Measures 2022 (PAM), only regulates the minimum and maximum notches principals can be paid, based on their school's PPN-provisioned posts (Section A.3). However, these notches do not appear to be strictly binding in practice. The PAM often allows principals to be paid below the entry notch of qualified educators, which is clearly implausible. This ambiguity means it is difficult to determine the exact cost of small school principals and by how much rationalizing these positions would reduce overall salary costs. Nonetheless, I have assumed principals are in fact paid more than educators as many provinces have implemented principal hiring freezes as a first step to cost containment.

Table 2: Descriptive statistics by province (Part 1)

Descriptive statistics by province (Part 1)					
Metric	**Easter Cape**	**Free State**	**Gauteng**	**KwaZulu-Natal**	**Limpopo**
Percent multigrade schools	45%	11%	5%	24%	21%
Count multigrade schools	2 343	107	155	1 430	800
Sum learners in multigraade schools	277 101	11 635	21 658	177 713	128 816
Percent learners in multigrade schools	15%	2%	1%	6%	7%
Sum educators in multigrade schools	11 098	516	927	7 565	4 087
Percent educators in multigrade schools	18%	2%	1%	8%	7%
LER in multigrade schools	25	28	61	24	31
LER in non-multigrade schools	30	28	26	30	32
Multigrade travel time to city (min)	62	20	1	55	63
Multigrade distance to nearest school (km)	2.36	5.71	0.65	2.63	2.13
Multigrade distance to nearest same phase (km)	2.91	9.61	1.41	3.44	3.79

Descriptive statistics by province (Part 2)					
Metric	**Mpumalanga**	**Northern Cape**	**North West**	**Western Cape**	**National**
Percent multigrade schools	8%	22%	15%	13%	23%
Count multigrade schools	135	122	217	237	5 546
Sum learners in multigraade schools	19 459	11 469	26 654	18 221	692 726
Percent learners in multigrade schools	2%	4%	3%	1%	5%
Sum educators in multigrade schools	741	571	7 722	1 007	27 634
Percent educators in multigrade schools	2%	5%	4%	2%	6%
LER in multigrade schools	26	19	25	18	26
LER in non-multigrade schools	31	28	30	27	29
Multigrade travel time to city (min)	30	139	59	18	47
Multigrade distance to nearest school (km)	3.88	12.49	4.93	5.92	2.93
Multigrade distance to nearest same phase (km)	5.49	15.04	6.91	8.65	3.99

Multigrade schools are on average very close to the nearest school and to schools of the same phase. As will be seen subsequently, this might not mean that removing these schools will guarantee that all learners are within walking distance. However, it does suggest that with a national average of only 4km to the nearest school of the same phase, learner transport is unlikely to be particularly costly when compared to the costs inherent in supporting a large number of small schools.

The proportion of multigrade schools nationwide has remained stable at approximately 22% between 2017 and 2023. However, this trend varies across provinces. Gauteng, Mpumalanga, Limpopo, and most notably the Free State, have seen declines in the percentage of multigrade schools. In contrast, other provinces have either experienced stagnation or increases in the proportion of multigrade schools, with the Eastern Cape showing a particularly notable rise (see **Figure 2**).

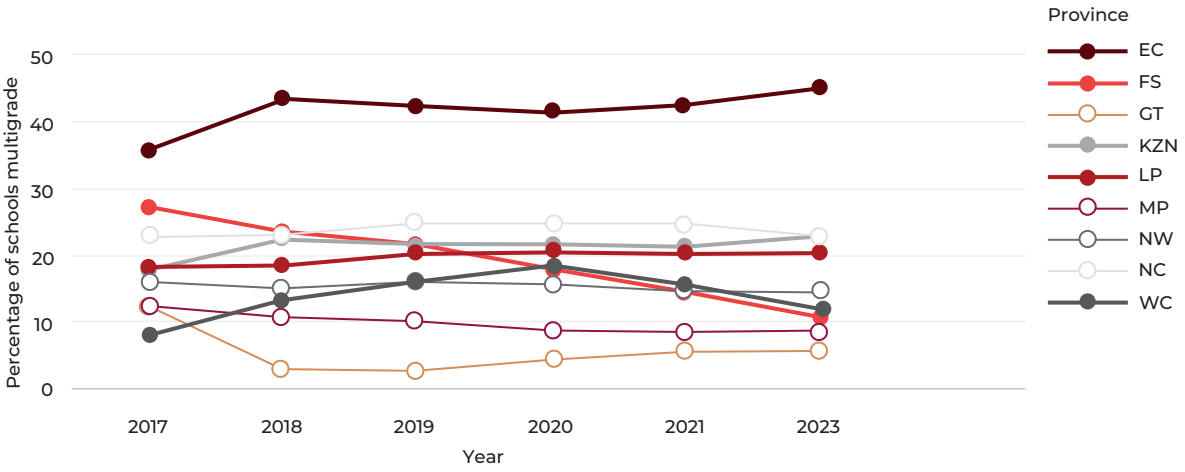

Figure 2: Percentage of schools multigrade by province and year (2017 to 2023)

These trends are also reflected in the general increase in average learner counts in schools, again, notably in the Free State which increased from 280 learners per school in 2000 to 710 in 2023. The Free State has accomplished this dramatic increase in average schools size by rationalizing small and multigrade schools, closing 601 schools (39%. of schools, accounting for 4.5% of learners) between 2009 and 2022, see **Figure 3**. This was occurring through a moderate increase in learner numbers from 656 000 to 730 000 learners provincially. This was likely accomplished through increases in learner transport and learner housing. Contrasting this, the Eastern Cape has experienced a steady decline in the size of schools, and a decrease in the learner-educator ratio. This has deepened the Eastern Cape's precarious financial situation wherein the ratio of learners to educators is not sustainable.

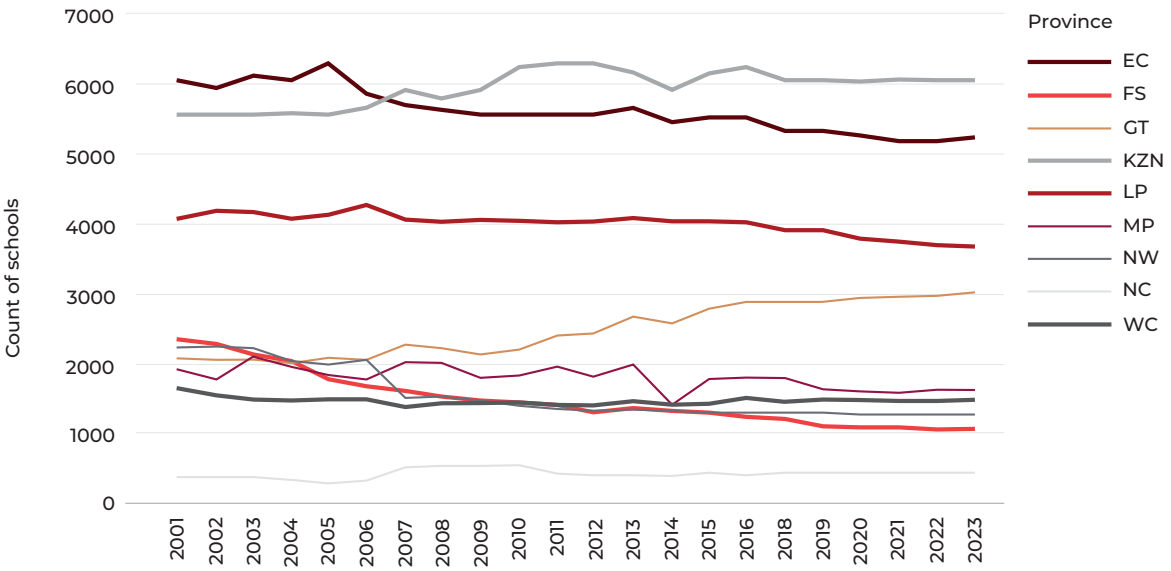

Figure 3: School count by province and year (2001 to 2023)

5. COSTS OF MULTIGRADE AND SMALL SCHOOLS

5.1 Pedagogical limitations

Teaching multiple grades in a single classroom, particularly in resource-constrained contexts like South Africa, poses significant pedagogical challenges. One of the most pressing issues is the difficulty in aligning curricula for different grades. Each grade has distinct learning objectives, and teachers often lack the time, training, and resources to develop lesson plans that adequately address the diverse academic requirements within a single classroom. This frequently results in surface-level teaching, where essential concepts are either rushed or neglected, leaving learners with critical gaps in knowledge (Berry 2010; Unesco 1989).

The need for age-differentiated instruction further complicates the situation. Multi-grade classrooms demand that teachers simultaneously address a wide range of developmental stages and learning abilities. In under-resourced settings, where teachers often lack access to training and instructional materials, this becomes particularly challenging. For example, younger learners may require intensive foundational support, while older learners need opportunities for deeper engagement. The inability to balance these demands often leads to inequitable learning outcomes, where some learners are unintentionally prioritised over others (Little 2006).

Classroom management is another significant hurdle. Teachers must navigate the behavioural and engagement needs of learners at different cognitive and emotional maturity levels. This can lead to behavioural disruptions that impede the flow of lessons. Younger learners may demand constant attention, while older learners risk disengagement if their educational needs are not adequately met. Such dynamics undermine the classroom's overall effectiveness.

Additionally, peer collaboration and group reading, valuable pedagogical strategies, are often limited in multigrade settings. Learners at different developmental stages may struggle to work together effectively, with older learners dominating activities and younger ones feeling excluded. This diminishes the potential for collaborative learning to enhance understanding and foster classroom cohesion. In resource-constrained environments, where teacher-led instruction is already strained, the lack of effective peer support further compromises learning outcomes.

The causal analyses that look at the effect of grouping learners by assessed learning ability show very strong effective sizes (Banerjee et al. 2016). Yet, the evidence for the pedagogical costs of multigrade teaching is mixed and outdated (Veenman 1995). Nonetheless, the theoretical reasons to avoid multigrade education, outlined above, seem adequate as a foundation to avoid multigrade learning for pedagogic reasons.

6. ECONOMIES OF SCALE IN EDUCATION

A key rationale for consolidating small schools lies in the fundamental concept of economies of scale. In economic terms, schools, like many production units, achieve cost advantages when they operate at a sufficiently large scale, thereby spreading fixed costs over a wider base of learners. Large schools can afford to invest in resources (both human and physical) that become uneconomical for smaller schools to sustain. The basic idea is that certain inputs—such as principals, administrative staff, and infrastructure—are largely "fixed" in the sense that they do not increase proportionately with the number of learners. As the school size grows, the *per-learner* cost of these fixed inputs declines.

In the context of South Africa, small schools pose a marked challenge to achieving efficiency through scale. Even though they serve relatively few learners, each school must maintain, at a minimum, its own principal and a set of teachers. Post-provisioning norms attempt to partially compensate small schools by allocating more educators per learner compared to larger schools, yet they do not eliminate the structural inefficiencies that arise when fixed roles have to be replicated across a large number of small institutions.

Notably, although small schools only consume 6% of the educators in the education system, each likely requires a highly paid principal, which may mean that as many as 23% of the country's principals (the percentage of multigrade schools) are being allocated to 5% of the learners. This differential highlights the massive wage bill implications of small schools. In aggregate, the cost of maintaining these additional principals is likely to be substantial, crowding out potential investments in educational materials, improved infrastructure, and specialist teaching staff, contributing to the hiring freezes and downsizing being experienced across the country.

6.1 Human resourcing and specialisation

An additional dimension of economies of scale is the scope for role specialisation. Large schools can employ specialist subject teachers—such as foundational literacy and mathematics educators—who devote their attention to a given discipline. They can also hire specialised administrative and support staff (for instance, office administrators, cleaning and maintenance, etc). In smaller schools, especially those that are multigrade, one individual often ends up juggling multiple roles. A single teacher might be responsible for teaching multiple subjects across disparate levels, while the principal is often forced to teach per post provisioning norm requirements, as well as handle administrative tasks. Such an arrangement limits the depth of expertise that can be applied to each role.

In settings where financial resources are constrained, role specialisation is vital for delivering higher-quality education and for fostering teacher development. The problem is further compounded in remote and under-resourced regions—such as many of the former homelands—where there is already a shortage of effective teachers. This inability to specialise ultimately constrains both the breadth and depth of academic opportunities offered to learners. It also hampers the administrative efficiency of the school, because principals cannot delegate tasks to suitably trained personnel; instead, they find themselves overburdened by management and teaching duties, with inadequate time to master either domain.

6.2 The last-mile problem

In addition to human resources, the logistics of running a school system at scale must be considered. The notion of the "last-mile problem"—often discussed in the economics of logistics—refers to the disproportionately high costs incurred when distributing goods or services to multiple, geographically dispersed endpoints. In an educational context, these goods and services include the delivery of textbooks, school meals, cleaning supplies, and other learning and teaching support materials (LTSM). When schools are few and large, economies of scale in logistics are more easily achieved. A single truck, for example, can deliver a substantial load of school meals or textbooks to one urban-based institution, minimising transport costs per learner.

By contrast, delivering the same volume of resources to numerous small schools located in remote rural areas drastically increases per-learner costs. The routes are often longer, the roads less developed, and the fraction of the delivery load per school is smaller, meaning transport vehicles cover great distances with less cargo each time. This erodes any marginal cost advantage that might be reaped through bulk purchasing at a provincial or national level. Even in moderately large rural schools, the average cost per learner for deliveries tends to be more manageable than in those extremely small and scattered schools that characterise much of the South African education landscape. Consequently, from a purely logistical point of view, the proliferation of small schools represents an inefficiency in resource distribution. These cost inefficiencies, when scaled up across thousands of small schools, can become a significant burden on provincial education budgets and hamper efforts to achieve equitable resourcing.

6.3 Infrastructure & maintenance

The capital expenditure requirements of a functional school are another domain where economies of scale become relevant. Schools require basic facilities—classrooms, administrative offices, toilet blocks, sports areas, libraries, and access to electricity and water, see **Table 3** for the DBE requirements for micro schools (schools with fewer than 125 learners) (Department of Basic Education 2013). In large schools, these facilities can be built and maintained at a relatively low per-learner cost, because the cost is amortised over many users. However, very small schools typically cannot afford the full range of these facilities per learner, resulting in inadequate infrastructure

that fails to meet minimal quality standards. Many small rural schools in former homeland areas are likely to still utilise pit latrines, where the problem is most concentrated, lack reliable electricity and internet connections, and cannot offer computer access.

Table 3: DBE Infrastructure Requirements for Small, Medium, and Large 'micro schools'

Infrastructure	Small (0–25)	Medium (25–65)	Large (65–125)
Classrooms	1–2	2–4	4–6
Multipurpose classroom (Library/ Computer/Science laboratory)	1	1	1
Principal's office	x	x	x
Admin office	x	x	x
Strong room	x	x	x
Staff room		x	x
Kitchenette		x	x
Grade R classroom	1	1	1
Covered dining area	1	1	1
Parking bays (per post establishment)	x	x	x
Toilets (Learner Toilets: Girls, Boys, Grade R)	6	6	11
Toilets (Staff Toilets,: Female, Male)	1	1	2
Nutrition centre where National Schools Nutrition Program is implemented	x	x	x
Area for physical, education, sport and recreation	x	x	x

(Department of Basic Education 2013)

These infrastructural shortcomings create significant barriers to improving educational outcomes. Without electricity, for instance, it is challenging to integrate modern technology into the classroom. Limited or non-existent sanitation facilities undermine basic health and hygiene, posing public health risks that can affect attendance and community perceptions of schooling. The absence of a dedicated school libraries and specialised classrooms restricts the types of curricular experiences the institution can provide. Thus, the marginal cost of adding or upgrading facilities in a small school—whether it be installing an electricity line or constructing a new building—becomes exorbitant when assessed on a per-learner basis.

Maintenance demands similar economies-of-scale considerations. In a large school, a single maintenance personnel may be sufficient to address routine upkeep tasks, from fixing broken windows to painting walls and repairing equipment. In smaller schools, the absolute demand for such tasks may be lower, but the per-learner cost of employing or contracting such services tends to be higher. The "last-mile problem" resurfaces in the form of getting materials and personnel to dispersed locations for this maintenance. Moreover, smaller schools, especially in remote areas, do not benefit from the same bargaining power as larger institutions when procuring maintenance services or materials. Bulk discounts and economies of scale in scheduling can be elusive when schools are spread out over great distances.

Compounding the issue, as a large number of multigrade and micro schools are located in the former homelands, it seems reasonable to speculate that many were built to minimal standards and which have since deteriorated. These older structures often require frequent and more intensive repairs—repairs that are costlier per learner, given the small enrolment. The interplay of weak infrastructure, limited funding, and high per-learner maintenance costs further underscores the unsustainability of operating so many small schools, particularly when consolidated facilities could benefit from centralised budgets and larger, more specialised maintenance teams.

6.4 Regulatory & bureaucratic overhead

A less commonly discussed cost relates to the regulatory and bureaucratic overhead. Every school, regardless of size, is subject to the same reporting and compliance requirements imposed by the Department of Basic Education and Provincial Education Departments. These obligations may include financial audits, submission of enrolment data, and adherence to safety regulations. In principle, a small school may not find it any simpler to fill out these forms and comply with regulations than a large school—indeed, it can be more onerous given that there are fewer administrative staff. When multiplied across hundreds of small schools, this compliance overhead generates inefficiencies at both the school and departmental levels, as more effort is spent ensuring each institution meets uniform requirements.

Furthermore, small schools complicate teacher deployment planning and district support. A province may struggle to efficiently allocate new graduates or specialised teachers, given that each additional teacher slot in a small school might only cover a handful of learners. This results in constraints on staff mobility and a mismatch between teacher skills and the demands of specific schools. In large schools, by contrast, teacher allocation can be made more flexible, with multiple teachers specialising in different subjects or roles.

Finally, at the system-wide level, the presence of numerous small schools amplifies disparities in educational quality. When resources are stretched across many locations, wealthier or better-located schools may receive relatively more political or administrative attention, leaving small rural schools even further behind. This dynamic perpetuates historical inequalities, particularly in areas most affected by the legacy of Bantu Education. Rationalising small schools, under careful planning and community engagement, could thus serve as a strategy for both cost containment and equity enhancement.

7. RISKS AND CHALLENGES IN RATIONALISING SMALL AND MULTIGRADE SCHOOLS

7.1 Learner transport

Learner transport is frequently seen as a necessary means of retaining access when small schools close. However, as will be shown, there are likely a substantial number of schools which might be rationalised without requiring learner transport as learners will retain walkable accessibility to other schools. This is discussed extensively in a later section. Nonetheless, obstacles complicate the expansion of learner transport. First, many provinces are failing to provide adequate learner transport at present, which may call into question the feasibility of learner transport expansion. Yet, as small schools are likely more costly to run, lifting these costs might provide ample fiscal clearance to expand learner transport. Second, colluding taxi associations often demand higher prices for learner transport contracts than the rates that provincial education departments (PEDs) can afford. Such negotiations can lead to protracted stand-offs, delaying the start of transport routes or forcing learners to walk long distances in the interim. Third, there are safety concerns.

Buses and taxis must travel poorly maintained rural roads, risking breakdowns or accidents, and unroadworthy vehicles can put learners in jeopardy. Fourth, effectively monitoring these transport services presents its own challenges. Provinces with large geographic spans and limited administrative capacity can struggle to ensure that contract operators abide by the required safety and punctuality standards. Fifth, as younger learners in many multigrade schools are particularly vulnerable, parents and communities may be reluctant to send them on long, unsupervised journeys—even if the transport is subsidised. Despite these challenges, the Free State provides some evidence that learner transport can facilitate successful school rationalisation in specific contexts, provided strong oversight and partnerships are in place. Over time, prudent contracting and thorough engagement with communities may help other provinces replicate these successes. Ultimately, as will be noted in subsequent sections, closing or merging schools without ensuring safe and reliable transport risks excluding the very learners that education policies aim to uplift.

7.2 Learner housing

When journeys exceed a feasible daily commute, learner accommodation is sometimes proposed as an alternative to transport. Indeed, the Free State's experience indicates that, even with the initial capital outlay for and running costs of boarding facilities, concentrating learners in fewer, larger schools can be of a similar costs as running many micro schools. Still, this approach poses serious risks and ethical considerations. One significant concern is the younger average age of learners in multigrade schools, who would be most affected by leaving home to attend boarding facilities. The psychosocial implications for these children—some as young as Grade R—are not fully understood and may include trauma from separation, heightened homesickness, or vulnerability to bullying and abuse.

Although the Department of Basic Education (DBE) and PEDs can enforce regulations to protect boarders, strong oversight is difficult to guarantee, particularly in rural regions with limited monitoring capacity. Without rigorous and regular inspections, instances of neglect, intimidation, or more severe abuses may go undetected. Only a narrow set of schools might be well positioned to support a significant expansion of their boarding capacity. Such schools typically already have a strong track record of academic performance and adequate management systems. Therefore, it is likely that learner housing should be considered as a scalable option only for a small subset of schools. In most other areas, a focus on improved access to day schools—whether through subsidised transport or strategic infrastructure upgrades—will remain a less disruptive path to rationalisation.

7.3 Schools as community focal points

Small schools, especially those located in rural or marginalised areas, often serve as crucial community anchors. They can act as meeting spaces, adult education venues, or focal points for cultural events and, of course, voting stations. In some regions, the school's presence is one of the few ways in which the community remains connected to the broader public service network, including health campaigns or social welfare visits. Consequently, when a school closes, the community loses not only an educational institution but also a shared physical and symbolic space. This can exacerbate perceptions of neglect or marginalisation, thereby triggering fierce local opposition, even if learners have another school fairly close by. In many instances, local leaders may believe that that the social cost of losing a school outweighs the potential efficiency gains. The perceived or actual loss of local identity is no small matter, particularly in areas with historical experiences of forced removals or disenfranchisement. Consequently, rationalisation programmes must involve careful stakeholder consultations.

7.4 Educator resistance

While the Employment of Educators Act (1998, amended 2022) provides for the redeployment of educators, it is not always straightforward to enforce. Teachers may have built personal and professional networks in a particular locale and might resist compulsory transfers on the grounds of family commitments or simply a preference for their current position. In such cases, unions can exert significant influence, potentially delaying or derailing school closures through labour disputes. Moreover, educators in smaller schools sometimes fear a loss of autonomy or seniority if they move to a bigger school. In a small school, a single teacher may teach multiple subjects and hold several responsibilities, often enjoying relatively close relationships with local communities. Shifting to a larger institution means adapting to more standardised roles, clearer hierarchical structures, and unfamiliar communities. Such dramatic changes can lead to job dissatisfaction and attrition if not accompanied by adequate support, career development opportunities, and incentives. For this reason, genuine engagement with educator unions and clearly articulated redeployment frameworks are essential to avoid protracted conflicts that could undermine rationalisation efforts.

7.5 Capital outlay

Finally, expanding receiving schools to accommodate learners from closed or merged institutions requires significant capital investment, particularly in infrastructure. This may include the construction of additional classrooms, dormitories for boarding facilities where necessary, and specialised spaces such as offices. Further costs involve upgrading essential amenities like sanitation facilities, water supply, and electricity to accommodate increased enrolment. While these

expenses can be substantial upfront, they often represent a more cost-effective long-term strategy compared to the ongoing inefficiencies of maintaining numerous underutilised small schools. To maximise the impact of these investments, it is crucial that expansion plans are carefully aligned with demographic trends, ensuring that receiving schools can sustainably meet the needs of their communities for years to come.

8. SCOPE FOR MERGING SCHOOLS

The most significant barrier to rationalising schools is reducing accessibility. Accessibility might be considered on multiple levels, keeping a school within walking distance, within bicycling distance, within public transport distance, and finally, far enough to require learner transport. This distance is ultimately about how long a learner should reasonably be expected to travel to get to school within their given means. Determining which schools can be closed or merged without reducing accessibility at scale is a non-trivial problem. Not least because a learner's distance from a school might not correspond to the time it takes them to get to school: the path or road might be very winding, the driving surface might be very poor, etc. There are also complexity such as learner safety.

The DBE sets 5km as the threshold after which learner transport is required (these thresholds are discussed subsequently). However, the path a learner takes to school is practically never straight. Some distance must be added for the winding nature of paths, for the increased time taken to walk uphill, for crossing obstacles, etc. A plausible assumption is that a learner's residence within 3.3km of a school might require the learner to walk 50% longer to reach the school, i.e. 5km. We might then assign a radius of 3.3km from a school as adequately accessible for all able-bodied learners. Other distance thresholds may be employed for other modes of transport, which is explored subsequently.

I identify small, multigrade, and undersubscribed schools that could potentially close without increasing learner travel times. The following analysis defines each school's catchment area based on a reasonable travel distance for a given mode of travel. As per the above, a catchment area for walking might be defined by a circle with a 3.3km radius around a school, encompassing the homes of learners who can reasonably be expected to walk to school. A school is deemed eligible for closure only if its removal does not reduce the total geographic coverage provided by the combined catchment areas of all remaining schools (Gustafsson 2016). This ensures that the current level of accessibility is preserved.

A first approximation to this problem is straightforward: for each school, create its 3.3km buffer, then check if that buffer is already fully contained within the union of all the other schools' buffers (this approach is drawn from Gustafsson (2016)). If it is, the school's buffer can be deemed "redundant" or non-essential, suggesting that the school could potentially be removed while maintaining coverage for everyone previously served within 3.3km. This is illustrated in Figure 4. In panel A and panel B, there are sets of five buffered schools. In the set A1, the central school (the red point) is wholly covered by its neighbours' overlapping buffers, so removing it (A2) leaves the original coverage area unchanged. In set B1, however, removing the central school reveals a newly uncovered patch (B2) that had been only covered through the central school's overlap with its neighbours.

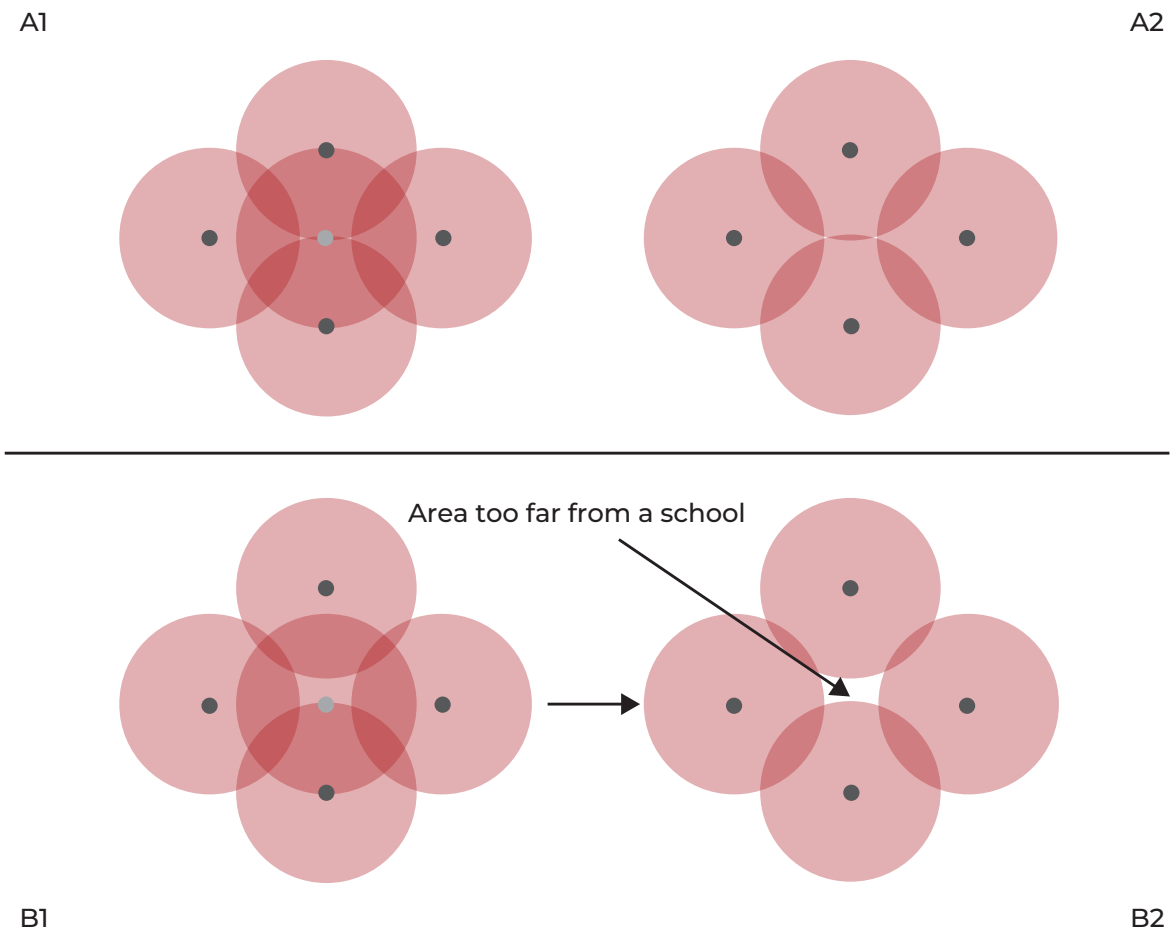

Figure 4: Determining whether a school can be removed without losing walkable access

The shortcoming of this approach is that it does not account for how multiple overlapping buffers may together cover certain regions only when all of them are present. In other words, a single buffer that appears redundant might be partially compensating for gaps left by other also defined as redundant, an interaction invisible in a simple one-at-a-time check. [2] To rigorously determine whether a school can be removed, we must identify the minimal subset of schools whose buffers collectively cover exactly the same area that the full set would cover. This is a classic example of the minimum set cover problem, a problem where there is no known polynomial-time algorithm to guarantee finding the best solution as the number of observations grows large. The required analysis must explore every possible combination of schools (or use sophisticated optimisation routines) to ensure that coverage is preserved while removing the maximum number of seemingly superfluous schools. This analysis has thus been omitted due to these computational costs.

There are several distance thresholds worth considering for assessing school accessibility. The National Learner Transport Policy (2015) does not explicitly mandate a walking distance after which learners must be provided with transport (DoT 2015). However, the earlier National Schools Transport Policy (2009), now superseded, specified a 3km threshold, equating to a 2km radius when applying the 50% heuristic described earlier. In a written reply to the National Council of Provinces, the Minister of Basic Education indicated that a 5km distance is the threshold beyond which learner transport is required (Minister of Basic Education 2022). Using the 50% heuristic, this suggests a practical radius of 3.3km.

2 As such, the count given provides an upper threshold, hence conservative discounting of distances by allowing learners 50% of the distance for extra travel time.

Beyond this distance, public transport may need to be subsidised, or explicit learner transport provided. For this analysis, as there are no published guidlines of which I am aware, I have somewhat arbitrarily chosen 5km as a threshold within which access by bicycle might be reasonable, and 10km as the distance at which learner transport would be required, though longer distances might also be justifiable. The critical constraint should be whether the learner's daily travel time is excessive (e.g., exceeding 2 hours) and whether the cost of transport is lower than the cost of operating the school—likely a threshold that is easily met.

In the following analysis, I have bundled the DBE's definition of micro schools (fewer than 125 learners) with multigrade schools to test whether these schools can be removed without reducing the coverage given by other schools within a first approximation. I have bundled these as multigrade schools present distinct pedagogical challenges and micro schools distinct inefficiency challenges.

Table 4: Scope for multigrade and Micro School Rationalisation

Multigrade & Micro (M&M) Schools with full covereage from other schools						
	2km			3.3km		
	M & M	Non-M&M	both	M & M	Non-M&M	both
Eastern Cape	144	677	821	1 061	1 706	2 767
Free State	16	350	366	24	438	462
Gauteng	246	1 882	2 128	298	2 282	2 580
Kwazulu-Natal	89	1 298	1 387	543	2 580	3 123
Limpopo	70	585	655	282	1 489	1 771
Mpumalanga	19	418	437	33	727	760
North West	11	186	197	20	302	322
Northern Cape	2	66	68	2	82	84
Western Cape	77	873	950	99	980	1 079
National	**674**	**6 335**	**7 009**	**2 362**	**10 586**	**12 948**
	5km			10km		
	M & M	Non-M&M	both	M & M	Non-M&M	both
Eastern Cape	1 906	2 285	4 191	2 220	2 514	4 734
Free State	28	489	517	41	569	610
Gauteng	311	2 442	2 753	322	2 560	2 882
Kwazulu-Natal	976	3 538	4 514	1 435	4 191	5 626
Limpopo	555	2 150	2 705	751	2 636	3 387
Mpumalanga	49	951	1 000	86	1 174	1 260
North West	43	503	546	126	856	982
Northern Cape	3	122	125	20	178	198
Western Cape	114	1 074	1 188	168	1 216	1 384
National	**3 985**	**13 554**	**17 539**	**5 169**	**15 894**	**21 063**

At the 3.3km threshold (which represents a 5km walking distance), there are potentially a large number of schools which might be rationalised in South Africa. There are 2 598 schools with full coverage from other schools at this threshold. It is probable that a large fraction of these might be rationalised without reducing walking access. As is to be expected, the number of schools grows dramatically the larger the threshold. Finally, the provincial percentages of rationalisable schools does vary somewhat substantially. It appears that more urban provinces, such as the Western Cape and Gauteng, have a larger fraction of schools which might be rationalised. In absolute numbers, Gauteng, KwaZulu-Natal, and the Eastern Cape present the largest opportunities for rationalisation.

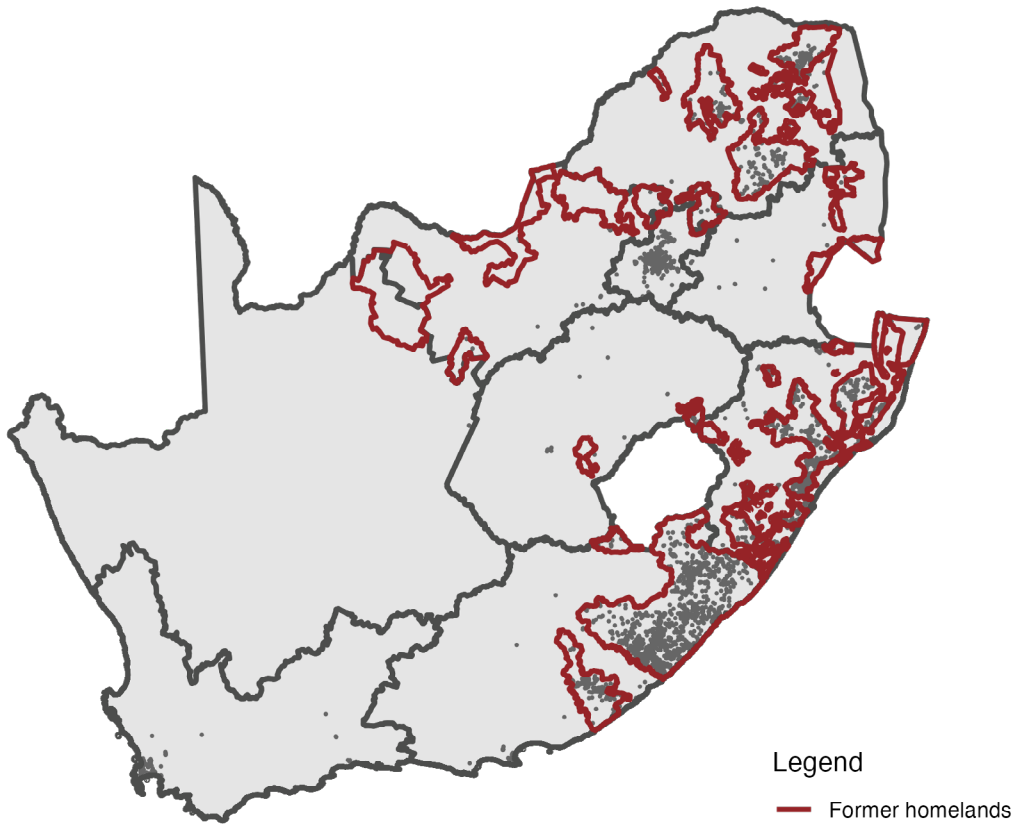

Figure 5: Multigrade & Micro schools with full coverage within 3.3km

9. UNDER-SUBSCRIBED SCHOOLS

Another substantial source of inefficiency in the South African education system is under-subscribed schools. At the level of human resourcing, these are school with a very small number of learners for every educator.[3] Significant under-subscription likely occurs when schools experience large reductions in learner numbers, such as through internal migration of learners, where educators are either not willing to move to receiving areas or who cannot be easily terminated.

It is hard to define this threshold, but for the purpose of this analysis, I will define under-subscription as a school in the bottom 15% of learner-educator ratios (the number of learners for every educator). Unfortunately, using such a crude definition would mean that wealthy schools with many SGB posts would likely also be captured as under-subscribed. As such, I have also excluded all fee-paying schools from the definition and all of the statistics in this section.

3 Under-subscription might also be defined in terms of infrastructure. For example, one might define under-subscription as schools with more classrooms than teachers. However, this is beyond the scope of this work.

Mpumalanga and the North West classify all schools as fee paying in the Masterlist, this seems unlikely and so these provinces have had all of their schools included regardless of fee status.

I will keep this section brief and simply replicate the descriptive analysis conducted for multigrade schools for under-subscribed schools. The patterns are as one might expect. These schools are more likely to be rural, in the former homelands, and be primary schools, see **Table 5**. The percent of multigrade schools and the count of learners in these schools is as follows: Northern Cape 26% of schools and ~6 900 learners, Eastern Cape 25% of schools and ~114 000 learners, and KwaZulu-Natal 20% of schools and ~112 000 learners, see @tbl-undersub_prov. Approximately 1 322 under-subscribed schools have a distance of 3.3km covered by a 3.3km buffer of other schools. The province with the most under-subscribed schools with coverage is the Eastern Cape with 705, see **Table 7**. It should be noted that these numbers are not mutually exclusive of the multigrade and micro schools analysis above.

Table 5: Comparison of undersubscribed and non-undersubscribed schools

Descriptive statistics Comparison of undersubscribed and non-undersubscribed schools		
Variable	**Non-undersubscribed**	**Undersubscribed**
Avg class count	15	9
Avg educator cournt	18	8
Avg grade count	7	7
Avg learner count	595	138
Black learners	95%	92%
Gender female	48%	47%
Homeland dummy	66%	69%
Learner educator ratio	32	17
No fees school	84%	88%
Overage learners	51%	46%
Phase: combined	6%	6%
Phase: intermediate	1%	2%
Phase: primary	65%	76%
Phase: secondary	27%	16%
Public school	100%	100%
Rural school	65%	81%
School count	16 850	2 973
Travel time to city (min)	52	70
White learners	3%	3%
Undersubscribed is defined as being in the bottom 15% of learner educator ratios Data are a combination of LURITS data, Masterlist data, and spatial covariates.		

Table 6: Under-subscribed school descriptive statistics by province

Descriptive statistics by province (Part 1)					
Metric	**Easter Cape**	**Free State**	**Gauteng**	**KwaZulu-Natal**	**Limpopo**
Percent multigrade schools	25%	11%	3%	20%	4%
Count multigrade schools	1 171	82	39	1 000	144
Sum learners in multigraade schools	114 460	16 927	10 963	112 125	17 848
Percent learners in multigrade schools	7%	3%	1%	5%	1%
Sum educators in multigrade schools	6 494	914	576	6 606	953
Percent educators in multigrade schools	13%	5%	1%	9%	2%
LER in multigrade schools	17	18	18	16	18
LER in non-multigrade schools	32	31	33	32	33
Multigrade travel time to city (min)	66	21	1	62	65
Multigrade distance to nearest school (km)	2.32	5.14	0.61	2.57	2.48
Multigrade distance to nearest same phase (km)	3.06	10.65	0.94	3.71	6.03

Table 7: Scope for under-subscribed school rationalisation

Under-subscribed Schools with full covereage from other schools						
	2km			**3.3km**		
	Undersubscribed	**Non-under**	**both**	**Undersubscribed**	**Non-under**	**both**
Eastern Cape	56	492	548	705	1 695	2 400
Free State	22	271	293	28	336	364
Gauteng	34	980	1 014	35	1 154	1 189
Kwazulu-Natal	56	777	833	368	2 088	2 456
Limpopo	23	527	550	100	1 513	1 613
Mpumalanga	34	378	412	53	668	721
North West	15	152	167	27	261	288
Northern Cape	0	13	13	0	16	16
Western Cape	40	407	411	6	447	453
National	**244**	**3 997**	**4 241**	**1 322**	**8 178**	**9 500**

Under-subscribed Schools with full covereage from other schools						
	5km			10km		
	Undersubscribed	Non-under	both	Undersubscribed	Non-under	both
Eastern Cape	1 302	2 483	3 785	15 113	2 781	4 294
Free State	30	374	404	36	427	463
Gauteng	36	1 252	1 288	38	1 317	1 355
Kwazulu-Natal	689	3 077	3 766	1 055	3 738	4 793
Limpopo	199	2 323	2 522	285	2 857	3 142
Mpumalanga	70	882	952	105	1 091	1 196
North West	48	461	509	125	812	937
Northern Cape	1	36	37	12	73	86
Western Cape	8	492	500	38	578	616
National	**2 383**	**11 380**	**13 763**	**3 208**	**13 674**	**16 882**

Descriptive statistics by province (Part 2)					
Metric	Mpumalanga	Northern Cape	North West	Western Cape	National
Percent multigrade schools	9%	26%	15%	12%	15%
Count multigrade schools	150	71	202	108	2 967
Sum learners in multigraade schools	59 055	6 901	59 162	10 805	408 246
Percent learners in multigrade schools	5%	6%	7%	1%	4%
Sum educators in multigrade schools	3 253	388	3 182	612	22 978
Percent educators in multigrade schools	9%	10%	12%	3%	7%
LER in multigrade schools	18	17	16	17	17
LER in non-multigrade schools	33	29	31	32	32
Multigrade travel time to city (min)	30	170	61	25	55
Multigrade distance to nearest school (km)	2.21	13.61	3.26	7.67	2.99
Multigrade distance to nearest same phase (km)	3.9	16.99	6.28	9.5	4.43

10. CONCLUSION

The rationalisation of small, multigrade schools in South Africa is both an urgent necessity and a complex challenge. On one hand, the economic realities are stark: operating a large number of undersubscribed schools is highly inefficient, especially within the constraints of an already overstretched national education budget. Personnel downsizing appears inevitable under these circumstances. This document aims to provide analytical guidance on where such downsizing could have limited or even positive impacts on learning outcomes by targeting schools characterised by poor pedagogical conditions, particularly multigrade teaching.

The inefficiencies of the current system are evident in several areas: disproportionate administrative overheads, the high per-learner cost of maintaining facilities, and logistical challenges in supplying resources to remote schools. Furthermore, the duplication of fixed roles—such as principal positions—across thousands of small schools contributes to a substantial wage bill that could be redirected towards improving teaching quality and strengthening infrastructure in better-resourced yet still accessible schools. From a pedagogical perspective, there are also strong reasons to avoid multigrade teaching, as it involves instructing learners at vastly different developmental stages within the same classroom, often to the detriment of educational outcomes.

On the other hand, school closures and mergers carry undeniable risks. Communities often rely on local schools as vital community pillars, providing not only educational services but also public meeting places, adult learning programmes, and various social support functions. Parents and teachers alike may feel a sense of dislocation and uncertainty at the prospect of travel or boarding options for younger learners, while teachers themselves may resist redeployment due to professional or personal attachments. If these complexities are not carefully addressed—through comprehensive consultation, adequate transport provisions, and well-supervised boarding facilities—rationalisation efforts may inadvertently compromise learner well-being or deepen social tensions.

Despite these challenges, the evidence suggests that a substantial number of multigrade or micro schools are geographically covered by other institutions, such that learners in those regions could retain the same level of walkable access even if one or more schools were closed. This finding hints at a potential pathway for greater efficiency that does not inevitably translate to increased travel times. Yet, a simple one-to-one replacement policy has clear limitations; a more nuanced approach that considers transport affordability, road conditions, and local socioeconomic contexts is essential. Where walking is not feasible, provincial authorities must ensure that transport services are safe, reliable, and cost-effective, drawing lessons from the Free State's successes in deploying learner transport to facilitate consolidation.

Ultimately, rationalising schools should be part of a broader strategy to strengthen educational outcomes, especially for learners in rural or under-resourced areas. Consolidation could yield economies of scale, enabling investments, inter alia, in better teaching materials, and improved infrastructure. However, any consolidation plan must incorporate substantial stakeholder engagement to uphold community trust. As such, the rationalisation of multigrade schools could serve as a catalyst for meaningful education reform, striking a balance between much-needed efficiency gains and the safeguarding of equitable, high-quality schooling.

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NOTES

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