3 PRIMARY SCHOOLS: 2002 TO 2012

3.1 Introduction

Buoyed by a resources boom, government funding for education substantially increased between 2002 and 2012. How has this funding affected the quality of school facilities and the number of teachers? Has the number of classrooms and teachers kept pace with enrolments and attendance? How has school governance and oversight fared? Was the last decade a good one for the education sector, or was it a lost decade? This chapter looks at findings from the 2002 (PESD) and 2012 (PEPE) surveys to answer these questions.

To do so it is split into six sections. Section 3.2 shows the accessibility of schools to key resources over the decade, while Section 3.3 examines the change in enrolment and attendance. The state of school facilities is examined in Section 3.4. Section 3.5 looks at changes to formal oversight and community engagement over the decade. Teacher numbers and performance are examined in Section 3.6. School financing is examined in Section 3.7. The conclusion sums up the chapter and reflects on what sort of decade it has been for primary education in PNG. The annex to this chapter includes a table of summary statistics for key variables.

Unless otherwise stated, the responses analysed in this chapter are from the Head Teacher surveys, and using the full 2002 and 2012 samples. 90 per cent confidence intervals (for figures) or standard errors (for tables) are shown for the national, decadal comparisons. Average ratios (for example, the ratio of students per teacher or the proportion of permanent classrooms) are calculated as the means of within-school ratios.

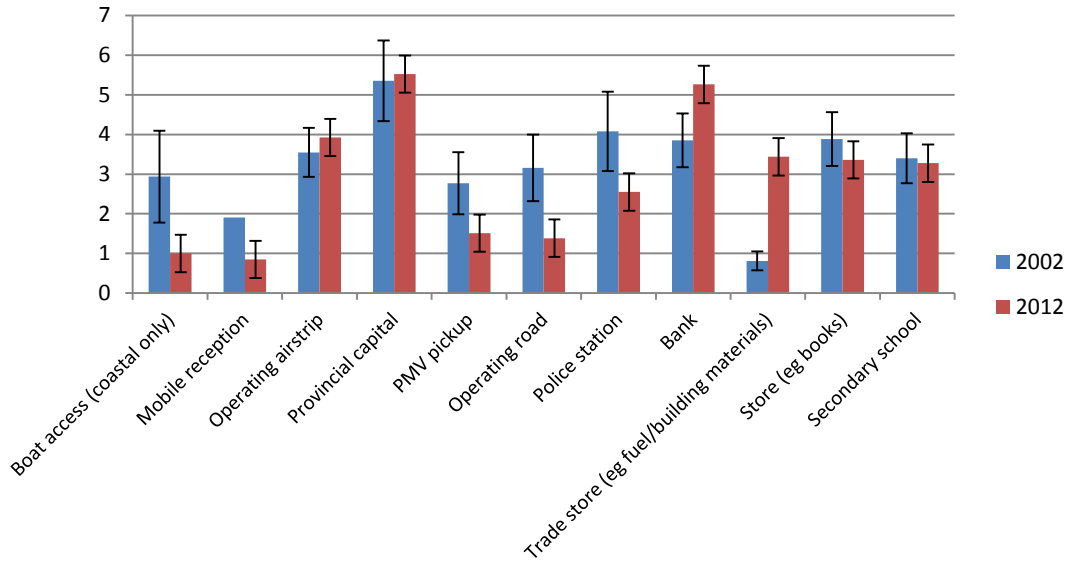
Overall, the chapter finds that the past decade has been one of expansion for primary schools. School enrolments have increased rapidly over the decade, and there are signs that more children are attending school; although absenteeism is on the rise. There are many indicators showing that school infrastructure has improved – classrooms are now more likely to be made of permanent materials and more have a chair and table for the teacher. Students have greater access to textbooks. Still, there are areas where investment is needed. Many teachers' houses and classrooms are in poor condition. Overcrowding has worsened, with teacher to student ratios deteriorating. Schools received 150 per cent more funding in 2012 than 2001. More funding makes oversight more important, but in 2012 only two-thirds of schools received a visit from a Standards Officer. While local school governance mechanisms are functioning and active, more

could be done to involve the community in overseeing and managing funds.

3.2 Access to infrastructure and resources

Schools in PNG face a myriad of challenges which they must overcome to provide students with a good education. For example, the structural constraints of remoteness restrict the ability of schools to hire (and keep) additional teachers and to maintain classrooms. Given this, an important first step in assessing progress and regress over the decade must include analysis of how access to key resources has changed. Figure 3-1 shows the number of hours Head Teachers estimated it took to get to key resources. It reveals that there have been some improvements in accessibility over the decade. Between 2002 and 2012, access to mobile reception, PMV (bus) pickup, and an operating road, significantly improved (Figure 3-1). For schools near the coast, it took less time to get to a boat. However, getting to a trade store selling fuel or building supplies took longer in 2012 than 2002.

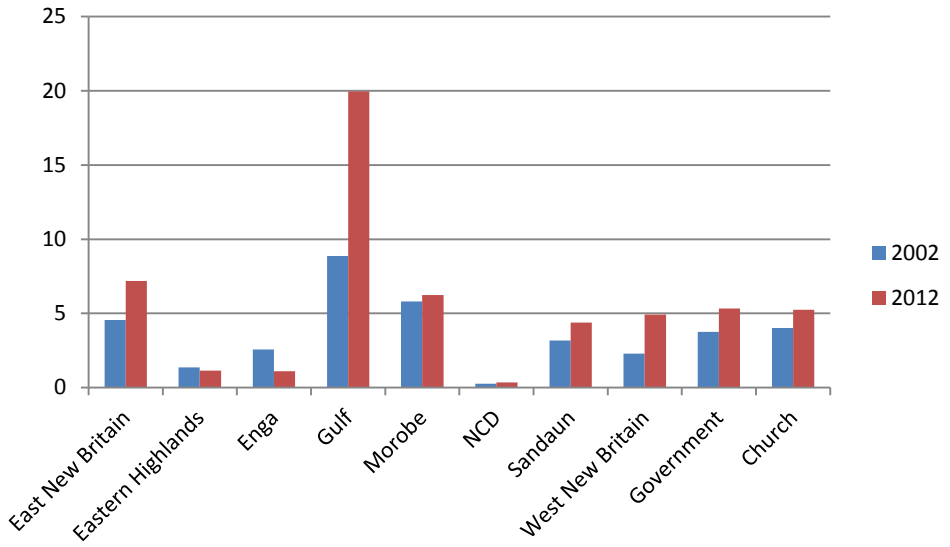
Figure 3-1: Hours to get to key resources from PEPE and PESD schools



Note: Error bars represent confidence intervals at the 90 per cent level throughout the report.

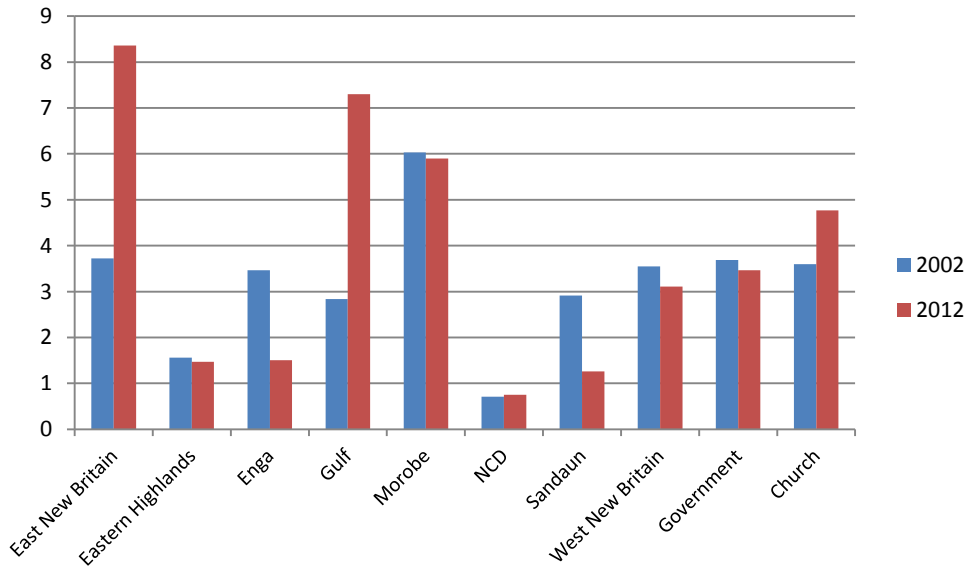
There are notable differences in accessibility between provinces and government and church facilities. Figure 3-2 shows that in 2012 it took twice as long to get to a bank in Gulf. The closure of the Bank of South Pacific's Kerema branch in 2008 is a key reason for this change. With the bank reopening in Kerema in June 2014, it is likely that these times have now reduced somewhat. Getting to a bank also took substantially longer in East New Britain, while most other provinces only recorded slight increases in time taken.

Figure 3-2: Hours to get to a bank by province, school agency



East New Britain recorded the longest time to get to an airport out of all the provinces in 2012 (Figure 3-3). Over the past decade travel time to an airport in this province more than doubled. This was mostly because of the closure of the Pomio district airstrip, which is located in the remote south-western corner of the province. Time taken to get to an operating airstrip also substantially increased in Gulf between 2002 and 2012.

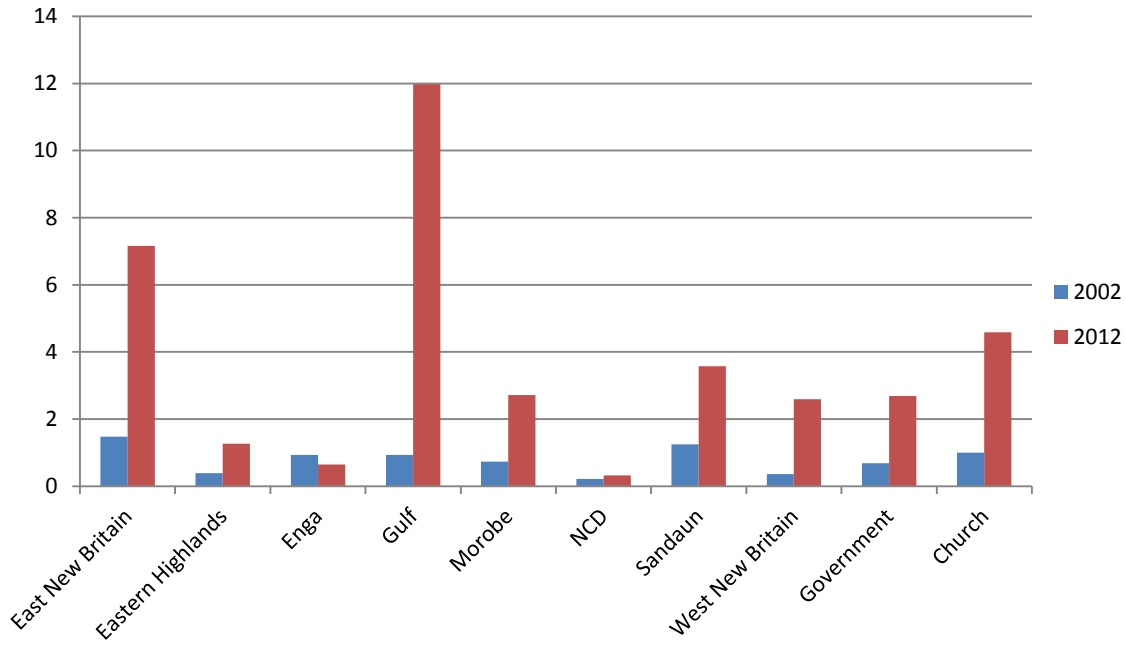
Figure 3-3: Hours to get to an operating airstrip, by province, school agency



All provinces except Enga and NCD saw substantial increases in the time taken to get to a trade store (Figure 3-4). In 2002 it took less than an hour to get to a trade store in most provinces; by 2012 it took 12 hours in Gulf, in East New Britain it took seven. Over the decade both government and church schools saw travel times increase. By 2012 it

took longer to get to a trade store from a church school than a government-run school.

Figure 3-4: Hours to get to a trade store, by province, school agency



The remoteness index we developed (see Chapter 2) showed that more schools were in very remote locations in 2012 compared to 2002. As Table 2-3 shows, their proportion doubled to 25 per cent of the sample in 2012. The remoteness index was devised with reference to five key resources. Expanding our analysis to include responses to the accessibility of 11 resources, as we have above, shows that the past decade has seen access to some resources improve, and to others worsen. Much of the deterioration in accessibility has been driven by Gulf, the most remote province in our sample. The findings also highlight the challenges that East New Britain faces, a province that, our subsequent analysis shows, performs better in the education sector than many others.

The reversals of accessibility are concerning as they relate to key school functions: airstrips provide remote schools with resources; banks are the source of school funding (including subsidy payments) and teachers' pay; and trade stores provide essential materials for building and maintenance of school buildings. However, improving access to these resources is mostly outside of the control of the education sector. This shows the importance that other sectors play in contributing to improved learning environments.

3.3 Demand for schooling: enrolments and attendance

Table 3-1 shows that between 2002 and 2012 there was a large increase in enrolments, with schools experiencing a 58 per cent

increase in student numbers.[9] This represents a significant increase in the enrolment rate given that the school age population grew by approximately 30 per cent over the same period. As we discuss in Chapter 5, a large part of this increase was due to the abolition of tuition fees in 2012. Chapter 5 also shows a large increase in enrolments between 2001 and 2002 (when tuition fees were temporarily abolished) giving a cumulative increase between 2001 and 2012 of 85 per cent.

Enga and Gulf featured the highest increase in student numbers, with a growth of over 85 per cent between 2002 and 2012. NCD was home to the largest schools: on average, they had over 1000 students enrolled in 2012. Church schools recorded higher growth than their government counterparts. As expected, given the high enrolment rates in NCD (a capital city with easy access to most resources), in 2002 and 2012 schools that were not remote had a higher *number* of students enrolled than those in remote areas. Interestingly, enrolments grew the most slowly where schools were either the most or the least remote. In the latter category, enrolment rates are already high, and in the former, the challenges of accessibility clearly remain daunting.

The share of girls among enrolled students rose sharply from 30 to 46 per cent. This implies that the number of girls enrolled in primary school grew over the decade by 144 per cent, and the number of boys by only 22 per cent.

Table 3-1: Comparison of average school enrolments

	Enrolment 2002	Enrolment 2012	Change 2002-2012	% Female 2002	% Female 2012
Overall	186	294	58%	30%	46%
	(13.4)	(18.5)		(0.7)	(1.7)
East New Britain	192	240	25%	21%	47%
West New Britain	165	246	49%	35%	46%
Morobe	104	174	67%	32%	56%
Sandaun	130	191	47%	36%	46%
Eastern Highlands	247	409	66%	21%	40%
Enga	282	530	88%	25%	41%
Gulf	109	202	85%	33%	45%
NCD	637	1,059	66%	37%	48%
Government	211	317	50%	30%	45%
Church	154	265	72%	30%	47%
Readily accessible	377	547	45%	33%	45%
Accessible	173	337	95%	31%	47%
Remote	111	223	101%	26%	47%
Very remote	95	143	51%	24%	45%

Note: Based on the Head Teacher survey and, where there are missing values, statistics from the NDoE. In all tables, standard errors are in parentheses.

9. Official NDoE enrolment numbers show an increase in primary school enrolments of 56 per cent over this period.

As the numbers of enrolled students increased, so too did student absence rates. The PEPE survey focused on Grade 5 classes. In 2012, only 71 per cent of students of the Grade 5 teachers' home class were present when the survey teams arrived, which compares poorly to the 84 per cent in 2002 (Table 3-2). In 2002 the attendance rate was 75 per cent or more in all provinces. By 2012 that dropped to close to 60 per cent in West New Britain, Sandaun and Gulf. The increase in student absence might be for several reasons. One is that the enrolment figures have become extremely important because as of 2012 each primary school gets K270 per student enrolled. This might lead to enrolment inflation. It is also possible that with a large increase in enrolments, a larger number of students are enrolled in school who have a lower level of commitment to attend. Finally, it is possible that if the quality of education has fallen (for example, due to over-crowding) more students might be deterred from attending school.

To understand the likelihood of students taking extended breaks we asked the Grade 5 teachers to tell us the number of their students that were absent for more than 10 days. Long-term absenteeism has increased, with the proportion of children absent for more than 10 days doubling between 2002 and 2012 (Table 3-2) – from 9 to 18 per cent. In 2012, overall, boys were more likely to miss school for long periods. Of those who were long-term absentees, one-third were girls in 2002 and 2012, less than their share in enrolments in 2012. This varied by province, with girls making up half of those away for long periods in Gulf in 2012. In Enga, girls' rate of absence has doubled over the decade. But in West New Britain, girls made up less than 30 per cent of long-term absentees.

Table 3-2: Proportion of Grade 5 students present and long-term absence (%)

	Present on the day of the survey		Missed more than 10 days		Girls who missed more than 10 days	
	2002	2012	2002	2012	2002	2012
Overall	84	71	9	18	35	35
	(1.2)	(2.1)	(1.0)	(1.2)	(3.5)	(2.0)
East New Britain	90	72	13	14	37	39
West New Britain	87	64	13	22	31	29
Morobe	90	69	6	23	28	28
Sandaun	83	62	9	15	29	37
Eastern Highlands	83	91	6	14	54	33
Enga	84	70	7	17	28	42
Gulf	77	61	19	20	39	47
NCD	85	76	12	16	39	42
Government	80	71	11	20	34	35
Church	88	73	7	15	39	33

Note: From the Grade 5 teacher survey.

Policy makers clearly need to put absenteeism, something which is little discussed in education policy in PNG, on the agenda. The National Department of Education's (NDoE) National Plan for Education (2004 to 2014) (NDoE, 2004) and its Universal Basic Education Plan 2010 to 2019 (NDoE, 2009) highlight the problems of teacher absence but are

silent on student absenteeism (they focus instead on retention). The increase in student absenteeism is a worrying development; it undermines some (but not all) of the gains of enrolment increases. Acknowledging and understanding the problem is the first step, seeking solutions is the next. To this end, more auditing of claimed enrolment figures could help: this is discussed further in Chapter 5.

If we combine the information in Tables 3-1 and 3-2 (assuming that all grades had the same increase in absenteeism), the increase in the number of children attending school would be 34 rather than 58 per cent over the ten year period, and 56 rather than 85 per cent taking 2001 as the base.[10] This lower but still large increase in the number of children attending school is reflected in the community's perception that more children are at school. 62 per cent of community representatives believed that most or all children were attending school in 2002. This increased to 70 percent in 2012 (Table 3-3). In East New Britain, West New Britain and Sandaun the proportion who said most or all attended school increased substantially over the decade. In Gulf, substantially fewer respondents said the majority of the community's children attended school in 2012 (37 per cent) compared to 2002 (63 per cent). In East New Britain, by contrast, the increase was from 37 to 90 per cent.

Table 3-3: Most or all children in the community attend school (%)

	2002	2012
Overall	62	70
	(3.2)	(4.0)
East New Britain	37	90
West New Britain	44	82
Morobe	66	52
Sandaun	67	83
Eastern Highlands	86	72
Enga	59	67
Gulf	63	37
NCD	70	77
Government	65	66
Church	59	76

Note: Percentage of parents (2002) and P&C Committee members (2012) saying that most children in their community attend school.

Increases in enrolments and attendance are to be welcomed, but how are school facilities coping with this influx? We examine this question in the following sections.

3.4 Classrooms, textbooks and facilities

This section highlights findings related to students' learning environment: it examines the change in classroom availability and condition; growth in textbooks; and the condition of key facilities that

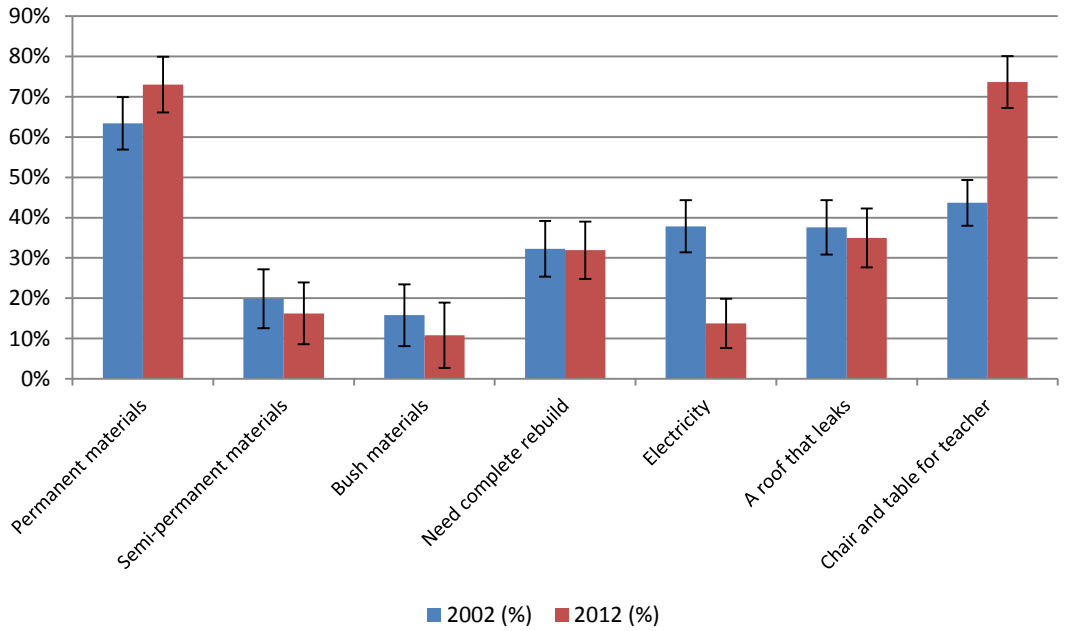
10. These are rough estimates, calculated using the sample means, and assuming absenteeism rates in 2001 and 2002 were equal.

aid learning. We also examine the condition of facilities for teachers, including staffrooms and teachers houses.

Classrooms

The NDoE's Universal Basic Education Plan for 2009 to 2019 (NDoE, 2009) aims for all primary school classrooms to be made of permanent materials by 2019. Figure 3-5 shows that there is still more that needs to be done to achieve this target as 27 per cent of classrooms were made of semi-permanent or bush materials in 2012. This was, however, down from 36 per cent in 2002. Compared to 2002, in 2012 the same proportion of classrooms needed to be completely rebuilt, and in both years a similar percentage had a roof that leaked when it rained. Still, there is evidence of improvement *within* the classroom: more classrooms had a chair and table for the teacher in 2012 compared to 2002. Classrooms that have access to electricity have halved (although as we show later in this chapter, access to electricity at the school level has increased).

Figure 3-5: Condition of classrooms (%)



The condition of classrooms varies greatly throughout the country. In 2012, in East New Britain and NCD over 89 per cent of classrooms were made of permanent materials and over 95 per cent had a chair and table for the teacher. In East New Britain only 15 per cent of classrooms needed to be rebuilt (Table 3-4). On the other side of the ledger, Gulf and Sandaun had the lowest proportion of classrooms made of permanent materials – less than 55 per cent. Enga had the lowest proportion of classrooms with a chair and table. Morobe had the highest proportion of classrooms needing to be rebuilt: 45 per cent required reconstruction in this province. Most provinces reported an improvement in the condition of classrooms over the past decade, yet

in Morobe, Gulf, Enga and NCD respondents said more classrooms required rebuilding in 2012 compared to 2002.

More government and church schools were built from better materials in 2012 and were more likely to have a chair and table for the teacher. However, a third of both church and government schools needed to be rebuilt in 2012. The condition of schools is also a function of remoteness. In 2012, fewer schools were made of permanent materials in remote areas, and the more remote the school the more likely its classrooms needed rebuilding.

The proportion of classrooms that do not need maintenance or rebuilding was unchanged over the decade. In 2002, only 29 per cent were in a good condition (not requiring maintenance or rebuilding) by 2012 it was 27 per cent.

Table 3-4: Condition of classrooms, disaggregated (%)

Percentage of classrooms	Made of permanent materials		With chair and table for the teacher		Needing rebuilding	
	2002	2012	2002	2012	2002	2012
Overall	63	73	44	74	32	32
	(2.4)	(2.0)	(2.9)	(2.3)	(2.2)	(1.9)
East New Britain	88	89	84	95	18	15
West New Britain	83	86	42	61	46	25
Morobe	66	69	50	91	27	45
Sandaun	33	52	35	80	50	40
Eastern Highlands	50	75	48	79	36	20
Enga	78	79	41	36	21	33
Gulf	56	54	44	49	29	42
NCD	92	100	79	100	20	23
Government	65	77	52	80	34	32
Church	63	68	44	73	31	31
Readily accessible	88	93	54	85	25	16
Accessible	53	77	44	76	37	30
Remote	64	73	50	88	31	34
Very remote	50	56	46	69	39	42

The number of classrooms at schools has increased over the decade. Table 3-5 shows that in 2012, on average, there were 8.4 classrooms per school, compared to 6.9 in 2002. Morobe and NCD had the biggest increases in classroom stock. The increase in classrooms has softened the impact of enrolment growth. The overall average number of students per classroom has increased by 20 per cent over the decade, to 32 students per classroom. This is a significant increase, but well below the 58 per cent increase in enrolments.

When taking out classrooms needing to be rebuilt from this calculation, so only considering functioning classrooms, the ratio of students-to-classrooms increases, as does the growth in number of students per classroom. In 2012 there was an average of 53 students per effective classroom, a 38 per cent increase from 2002. Students per functioning classroom were highest in NCD in 2012 (75 students per

functioning classroom). Morobe experienced the fastest increase over the decade. Enga, Eastern Highlands and West New Britain best managed to accommodate increasing enrolments: all these provinces saw less than a 10 per cent increase in the ratio of enrolled students per functioning classroom. West New Britain's performance shows the value of maintenance. By halving the number of classrooms requiring rebuilding, it was able to hold the growth of students per effective classroom to 9 per cent, despite a 49 per cent increase in enrolments.

While enrolments per classroom reduced as schools became more remote in 2012, remote schools had a similar ratio of students per functioning classroom compared to those in readily accessible locations.

If enrolment figures are inflated, as results from the Grade 5 teachers (Table 3-2) suggest they are, these numbers will exaggerate over-crowding. However, these results are still a cause for concern, particularly as students are less likely to attend overcrowded and dilapidated classrooms.

Table 3-5: Classrooms, and enrolled students per classroom and functioning classroom

	Classrooms per school			Enrolled students per classroom			Enrolled students per functioning classroom		
	2002	2012	Change	2002	2012	Change	2002	2012	Change
Overall	6.9	8.4	22%	26.7	32.0	20%	38.1	52.6	38%
		(0.4)	(0.3)		(1.0)	(1.35)		(3.1)	(6.5)
East New Britain	7.7	9.0	16%	25.9	25.6	-1%	27.7	40.6	46%
West New Britain	4.8	7.7	6%	30.3	29.4	-3%	41.2	44.8	9%
Morobe	5.7	6.2	54%	18.8	28.5	52%	25.1	53.8	114%
Sandaun	5.0	6.5	28%	27.4	30.2	10%	31.8	58.9	85%
Eastern Highlands	9.1	9.6	10%	26.1	42.4	62%	56.7	61.2	8%
Enga	8.4	12.9	6%	36.6	32.2	-12%	46.6	49.9	7%
Gulf	4.6	5.9	32%	25.6	24.7	-4%	31.7	37.4	18%
NCD	19.8	20.9	61%	41.1	53.4	30%	63.2	75.0	19%
Government	7.7	8.5	10%	28.1	33.2	18%	36.7	54.6	49%
Church	6.0	8.3	37%	25.0	30.0	20%	34.7	51.0	47%
Readily accessible	12.2	13.9	15%	33.3	35.4	6%	43.5	47.0	8%
Accessible	6.4	9.1	43%	27.8	35.3	27%	43.9	61.4	40%
Remote	5.1	6.3	24%	23.4	29.8	28%	32.0	47.2	47%
Very remote	4.4	5.7	26%	22.9	25.4	11%	33.3	45.8	38%

Textbooks

Averaging the availability of Grade 5 and 6 language and maths textbooks over schools, we find that textbook numbers increase over the decade – from 29.0 per subject and grade to 33.6, an increase of 16 per cent. The increase of textbooks was confirmed by Grade 5 teachers: 24 per cent said there were sufficient textbooks in 2002, this rose to 31 per cent in 2012.

There is a high degree of variability of textbook availability by grade and province. The decade has seen the availability of Grade 5 language textbooks decline in schools (Table 3-6). There were, on average, 10 fewer Grade 5 language textbooks in 2012 compared to 2002. On the other hand, overall, the availability of Grade 6 language and maths books more than doubled.

Teaching aids have not improved in availability over the decade. The percentage of Grade 5 teachers who could produce teaching aids was 79 per cent in 2002 and 78 per cent in 2012.

Table 3-6: Grades 5 and 6 maths and English textbooks per school

	Grade 5 maths		Grade 6 maths		Grade 5 language		Grade 6 language	
	2002	2012	2002	2012	2002	2012	2002	2012
Overall	42	38	19	39	42	32	15	33
	(3.0)	(3.0)	(2.4)	(2.2)	(1.8)	(3.7)	(1.9)	(2.2)
East New Britain	56	50	42	58	42	37	24	40
West New Britain	67	18	12	24	41	21	7	21
Morobe	39	28	15	26	51	25	8	27
Sandaun	57	35	29	38	53	27	27	27
Eastern Highlands	17	48	9	54	21	46	13	44
Enga	35	57	11	42	33	38	7	42
Gulf	31	35	13	31	45	28	18	28
NCD	44	48	32	52	83	42	46	47
Government	42	41	20	42	48	34	20	35
Church	41	34	17	36	36	30	11	31
Readily accessible	50	56	25	43	45	40	22	40
Accessible	36	37	17	41	40	36	13	37
Remote	44	36	18	36	44	35	11	37
Very remote	33	31	16	36	46	25	15	26

On a *per student* basis, the availability of Grade 5 and 6 textbooks has worsened slightly. The average student to textbook ratio for the two grades and subjects we surveyed across schools increased from 2.0 in 2002 to 2.2 in 2012. Again there was some significant variation by grade. Student per textbook ratios declined for Grade 6 maths and Grade 5 language textbooks but increased for Grade 5 maths and Grade 6 language textbooks increased (Table 3-7).

Table 3-7: Students per textbook, Grade 5 and 6

	Grade 5 maths		Grade 6 maths		Grade 5 language		Grade 6 language	
	2002	2012	2002	2012	2002	2012	2002	2012
Overall	1.5	2.1	2.3	1.8	3.0	2.4	1.3	2.1
	(0.3)	(0.3)	(0.4)	(0.3)	(0.6)	(0.4)	(0.3)	(0.3)
East New Britain	0.5	1.8	0.5	1.7	1.7	2.0	0.6	1.9
West New Britain	0.8	3.4	0.9	2.7	1.0	3.4	0.1	2.6
Morobe	2.0	1.4	2.0	1.0	3.4	1.2	1.9	1.1
Sandaun	1.6	1.0	1.5	1.0	1.1	1.7	0.3	1.6
Eastern Highlands	1.3	1.5	1.6	1.2	1.2	2.3	1.1	2.4
Enga	1.4	4.3	7.6	4.9	4.4	5.8	2.6	4.9
Gulf	1.8	1.8	3.0	1.2	10.6	2.1	1.8	1.1
NCD	4.6	4.1	6.6	3.5	6.7	4.4	3.3	3.5
Government	1.5	1.7	2.6	1.4	3.9	2.0	1.8	1.7
Church	1.5	2.6	2.1	2.5	1.9	3.2	0.7	2.9
Readily accessible	3.0	2.7	2.1	2.6	2.1	3.0	0.9	2.6
Accessible	1.6	2.9	2.3	2.6	2.4	3.5	1.0	3.0
Remote	0.9	1.1	2.4	1.1	5.1	1.4	1.1	1.5
Very remote	0.8	1.1	3.4	0.9	3.5	1.3	2.4	1.1

To put these findings in context, we can compare the numbers of textbooks in our survey to the targets of the NDoE and the Australian aid program, which distributed textbooks between 2010 and 2013. In its National Education Plan 2005-2014 (NDoE, 2004), the NDoE aimed for textbooks to be supplied at a ratio of two students to one textbook in lower primary and one-to-one in upper primary. The Australian aid program adopted the former target for primary schools; it aimed for all primary schools to have two students per textbook by 2015 (AusAID, 2010: 57). The Universal Basic Education Plan 2010 – 2019 (NDoE, 2009) goes further by calling for a ratio of one student to one textbook by 2019.

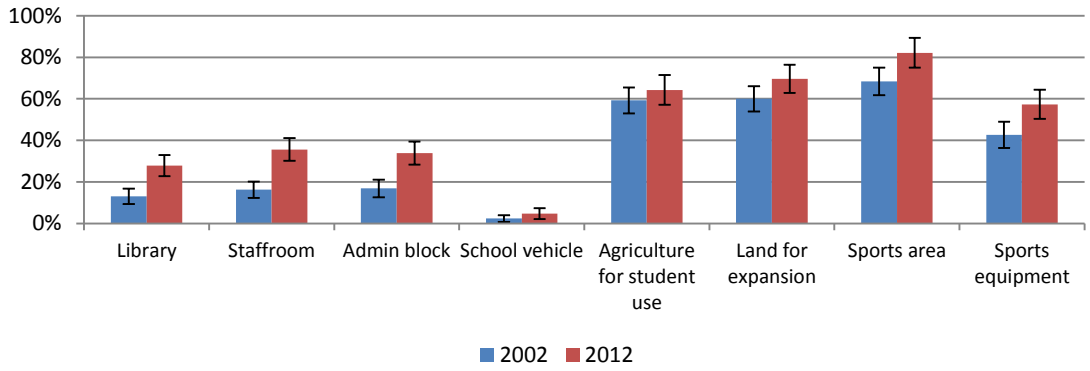
The good news is that the Australian aid program's target is almost being met: the ratio of two students to a textbook has largely been achieved. With rapid growth in the student population over this period, this is an impressive achievement. On the other hand, the NDoE is some way from reaching its 2019 target of one textbook per child. While in 2012 the average might be at two-students-per-textbook, in some schools – particularly those in NCD – it is well above this level. There are also questions about how the government will distribute textbooks now that the Australian aid program is no longer involved.

Facilities

While many are concerned that the quality of school infrastructure has gone backwards over the decade, we find that schools have seen a number of statistically significant improvements in the provision and quality of a range of key facilities. Between 2002 and 2012 the percentage of Head Teachers who thought there was an adequate or good provision of libraries, staffrooms, and administration blocks

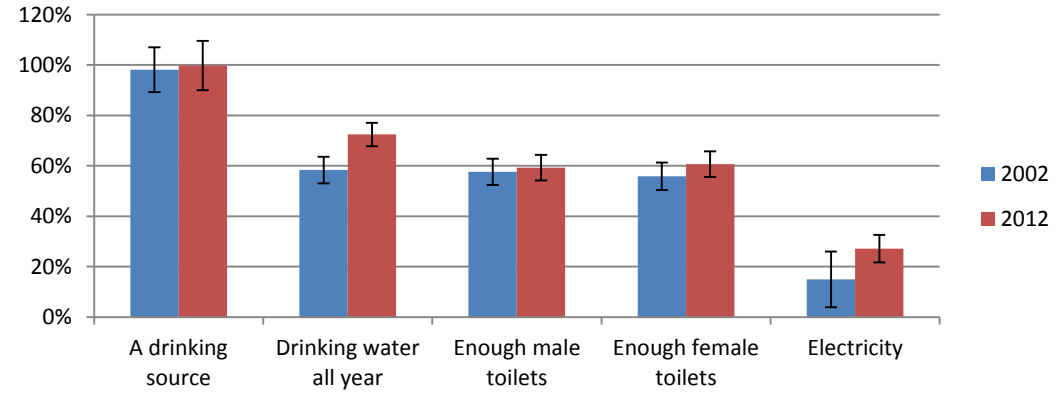
doubled (Figure 3-6). There was also a perception that the provision of other facilities improved, but not by as much.

Figure 3-6: Schools with adequate or good provision of facilities



Water and sanitation facilities have stayed the same or improved. All schools reported having a drinking source in 2012, which was similar to the situation in 2002 (Figure 3-7). Significantly, 72 per cent of schools are able to access drinking water all year, an improvement on the 50 per cent recorded in 2002. The provision of male and female toilets stayed the same over the decade; by 2012 only around 60 per cent of schools had enough toilets for both sexes. The percentage of schools with electricity doubled over the past decade: in 2012 only 27 per cent of schools had electricity, compared to 15 per cent ten years earlier.

Figure 3-7: Schools with water, toilets and electricity



The increase in available drinking water is a significant achievement. As illustrated in the box below, improving water supplies in schools has some very tangible benefits for students, teachers and the community.

Improving water access matters: the case of Tatana Primary School

Over the past ten years, Tatana primary school in NCD, one of the schools visited by researchers in both 2002 and 2012, has started to address what the PESD's qualitative report, *Wok Bung: A qualitative study of twelve primary schools in Papua New Guinea* (Guy, Paraide, Kippel, & Reta, 2003), identified as its most serious problem: an acute lack of water. The report noted that on most school days children had to take their own water, and that the school was often closed due to a lack of water supply. But in 2010 a water pump, supplied by InterOil, was installed to transfer water to the school.

Managed and housed by the President of the school's BoM, the tank pumps water to the school daily. This has meant that teachers do not have to leave the school to collect water, and that on most days children no longer have to bring their own water to school. The installation of an additional water tank on the school grounds has also helped secure water supplies. According to the Head Teacher, this has meant that students are at school longer and can better concentrate on their studies, rather than on getting a drink.

Teachers' houses

Like classrooms, the quality of materials used in teachers' houses improved over the decade. Overall there were more teachers' houses around schools: there were 5.2 in 2002 and 6.8 in 2012. More were made of permanent materials in 2012 (Figure 3-8), and fewer needed rebuilding. However, because they came from such a poor base in 2002, in 2012 teachers' houses were still in worse condition than classrooms. In 2012, 58 per cent of teachers' houses were made of permanent materials (Figure 3-8), compared to 73 per cent of classrooms (Figure 3-5); 38 per cent of teachers houses needed rebuilding, only 32 percent of classrooms were in such poor condition. The percentage of houses that did not require any maintenance or rebuilding increased, but not significantly, from 18 per cent to 20 per cent.

Figure 3-8: Condition of teachers' houses

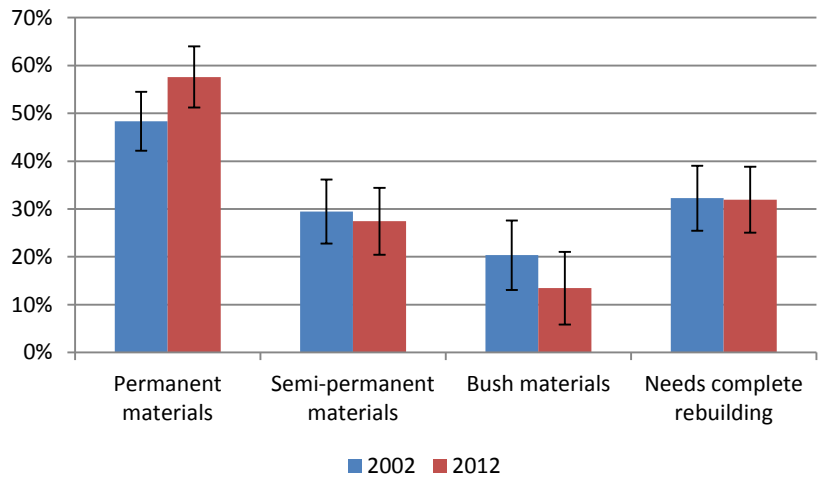


Table 3-8 shows that the demand for housing still exceeds supply: in 2002 and 2012 there were still about 2.5 teacher positions per functioning house (a house that didn't require rebuilding). NCD was the worst location for housing, it had 6.9 teachers to one effective house in 2012. Schools close to key resources had more teachers-per-functioning-house than remote schools.

Table 3-8: Teacher positions per functioning house

	2002	2012	Change
Overall	2.5	2.6	0%
	(0.1)	(0.1)	
East New Britain	3.1	2.0	-36%
West New Britain	1.7	2.2	32%
Morobe	2.2	2.2	2%
Sandaun	2.9	3.1	8%
Eastern Highlands	2.8	2.6	-8%
Enga	2.5	2.9	13%
Gulf	2.1	1.6	-22%
NCD	4.9	6.9	41%
Government	2.8	2.6	-5%
Church	2.1	2.5	19%
Readily accessible	3.3	3.3	2%
Accessible	2.6	2.8	8%
Remote	2.2	2.3	7%

3.5 Teachers

Teachers are essential for quality schooling; there needs to be enough turning up and teaching for students to learn. Table 3-9 shows the reported difference between the number of teacher positions to those actually working (who regularly turn up), and the increase in both. The number of teaching positions at the average school has increased from 7.9 to 9.6, and the number of teachers working has increased more from 6.5 to 8.7 per cent. The latter increase is statistically significant. It is also consistent with the fact that teacher numbers have been increasing in PNG. The teacher salary bill (including secondary teachers) has gone up by 25 per cent over the last ten years. NDoE statistics show that the total number of teachers in primary schools across the country increased from 21,653 in 2009 to 23,069 in 2012.

According to Head Teachers, the difference between teacher positions and those actually working decreased over the decade. In 2002 the difference between teacher positions and those working was 21 per cent, it dropped to 10 per cent in 2012. In both 2002 and 2012, Gulf reported the biggest difference between teacher positions and working teachers, while the gap was narrowest in NCD and East New Britain.

Table 3-9: Positions and working teachers, 2002 and 2012

	2002			2012		
	Positions	Working	Difference (%)	Positions	Working	Difference (%)
Overall	7.9	6.5	-21	9.6	8.7	-10
	(0.6)	(0.7)		(0.7)	(0.7)	
East New Britain	7.4	6.9	-7	9.2	9.0	-2
West New Britain	7.6	6.4	-19	9.4	8.7	-9
Morobe	5.7	4.8	-19	7.1	6.3	-13
Sandaun	5.9	4.5	-30	7.6	6.5	-17
Eastern Highlands	10.1	8.4	-20	11.2	10.4	-8
Enga	11.1	7.9	-41	15.1	13.7	-10
Gulf	4.4	2.8	-58	5.0	3.6	-38
NCD	23.8	22.9	-4	25.5	24.4	-4
Government	8.8	7.4	-19	9.9	9.1	-8
Church	6.9	5.5	-26	9.1	8.1	-13
Readily accessible	13.9	12.8	-9	16.0	16.1	1
Accessible	7.9	6.3	-26	10.7	9.6	-11
Remote	5.4	3.6	-48	7.5	6.3	-20
Very remote	4.8	3.5	-39	5.7	4.8	-20

The percentage of teachers absent on the day of the visit fell slightly between 2002 and 2012. The PESD report estimates an absence rate of 15 per cent in 2002, calculated by comparing those present with those said to be regularly working (World Bank and NRI, 2004, p. 71).[11] By 2012 that figure had fallen to 13 per cent. There will always be some absenteeism, due to ill-health or teachers being away on duty, but it is positive that the figure has fallen, or at least not risen

The number of "ghost teachers" appears to have dropped over the decade. The report on the 2002 PESD data (World Bank and NRI 2004) found that about 12-15 per cent of teachers were on the payroll for the schools surveyed in 2002 but were not regularly working. Our calculations suggest the percentage of reported ghost teachers is now negligible. Comparing our own data on teachers working with NDOE payroll data shows no differences at all (Table 3-10). This also confirms the accuracy of Education Management Information System (EMIS) data – as it shows that those on the system are likely working – which is available for 197 of the schools we surveyed. This does not mean that there are no ghost teachers at all (they might not be listed against schools, for example) but the results do suggest a significant improvement relative to 2002.

11. We recalculated other estimates but not this one from the PESD data due to the complexities of the data set in relation to this particular variable.

Table 3-10: Ghost teachers 2012

	Number of schools	Teachers on payroll	Teachers at school	Total ghost teachers	Ghost teachers (%)
PEPE 2012	214	2324	2331	-7	-0.29
EMIS 2012	197	1773	1760	13	0.71

Notes: EMIS is the Education Management Information System. EMIS data on the number of teachers at schools is provided by schools and is collected via the annual school census. Payroll data from NDoE for November 2012. PEPE data on number of teachers at schools is based on the Head Teacher survey (number of teachers regularly working).

Increases in teacher numbers have not been enough to compensate for growth of enrolments. Table 3-11 shows that student-per-teacher-position and students-per-working-teacher ratios have worsened. There are now more than 30 enrolled students per teaching position (up from 22 in 2002), and 36 students per working teacher (up from 31 in 2002). Morobe, Gulf, NCD and Eastern Highlands all saw high growth in both ratios over the decade. The stand out is East New Britain, where these ratios stayed the same or reduced, even though enrolments increased by 25 per cent (Table 3-1). Interestingly, the rate of increase in students attending school (based on the Grade 5 data shown in Table 3-2) is about equal to the rate of growth in working teachers, suggesting no increase in the number of attending students per working teacher from 2002 to 2012. However, as Chapter 5 shows, there are now some very large classes in some provinces and grades, and this might be deterring students from attending.

Table 3-11: Enrolled students per teacher position and working teacher

	Students per teacher position			Students per working teacher		
	2002	2012	Change	2002	2012	Change
Overall	21.8	30.3	39%	31.4	35.9	14%
	(0.6)	(1.1)		(1.5)	(1.6)	
East New Britain	25.6	25.0	-2%	27.8	25.9	-7%
West New Britain	18.8	22.5	20%	24.3	26.3	8%
Morobe	17.4	26.4	52%	23.9	41.5	73%
Sandaun	21.1	26.6	26%	30.9	31.7	2%
Eastern Highlands	23.8	38.3	61%	33.8	44.2	31%
Enga	24.4	36.4	49%	41.2	45.1	9%
Gulf	25.8	48.9	89%	50.1	78.5	57%
NCD	26.9	40.9	52%	29.6	41.5	40%
Government	22.5	30.5	36%	32.5	34.9	7%
Church	21.2	29.4	38%	30.7	37.5	22%
Readily accessible	26.2	34.8	33%	32.7	31.7	-3%
Accessible	21.5	30.1	40%	32.4	36.1	11%
Remote	20.3	31.2	54%	32.9	37.4	14%
Very remote	20.3	28.4	40%	30.0	38.5	28%

Notes: The students-per-teacher-position ratio is lower than the students-per-working-teacher ratio in all but one instance: in 2012 readily accessible schools were the exception. This could be because teachers are working in schools close to key resources even though they are posted elsewhere.

Gender

There are now more women in leadership and teaching positions in PNG schools. Between 2002 and 2012 the percentage of female Head Teachers (or acting Head Teachers) doubled (Table 3-12). There was much variation across the provinces, however. In 2012, two-thirds of NCD Head Teachers were women; yet, in Enga only 3 per cent were women. Sandaun stands out as the one province where the number of female Head Teachers fell over the decade. The proportion of female Grade 5 teachers almost doubled – from 27 per cent in 2002 to 55 per cent in 2012. Again, the variation between provinces was stark. While three-quarters of Grade 5 teachers were female in West New Britain this dropped to 30 per cent in Enga.

Table 3-12: Percentage of female Head Teachers and Grade 5 teachers

	Head Teacher (%)		Grade 5 Teacher (%)	
	2002	2012	2002	2012
Overall	13	27	27	55
	(2.2)	(2.8)	(3.1)	(3.2)
East New Britain	10	42	46	60
West New Britain	34	29	45	75
Morobe	7	33	27	71
Sandaun	17	10	16	47
Eastern Highlands	14	28	20	33
Enga	3	3	24	30
Gulf	0	20	7	46
NCD	33	63	50	71
Government	15	31	27	59
Church	10	19	26	49

Note: These figures are based on the gender of the Head Teacher and Grade 5 survey respondent respectively.

Length in position and willingness to continue

In both 2002 and 2012, on average, Head Teachers had been at their school for three years, but this varied greatly by province (Table 3-13). By 2012 Head Teachers in NCD had stayed at the schools for the longest, almost five years. On average, Grade 5 teachers stayed longer at their school than Head Teachers. In 2012, they had been at their current school for over four years; Grade 5 teachers in NCD and Enga had been in place for six and over seven years respectively.

Are Head Teachers and Grade 5 teachers motivated to continue? Yes for Head Teachers, no for Grade 5 teachers. Table 3-14 shows that only one quarter of Grade 5 teachers said they want to continue in 2012; this compares poorly to the over 80 per cent of Head Teachers who said they wanted to stay on. In Enga, NCD and Sandaun only 10 per cent of Grade 5 teachers wanted to continue. The difference in motivation between Head Teachers and Grade 5 teachers is likely related to the condition of teachers housing, which likely impacts teachers more than Head Teachers (from our field visits we were told that Head Teachers generally had better housing, or at least better options for housing. In

addition, if the Head Teacher has poor housing they have less time to wait to transfer to another school).

Table 3-13: Experience with school and desire to stay at school

	Years at school			Wants to stay at school		
	Head Teacher		Grade 5	Head Teacher (%)		Grade 5 (%)
	2002	2012	2012	2002	2012	2012
Overall	3.0	3.1	4.3	84	87	24
	(0.2)	(0.2)	(0.3)	(2.5)	(2.1)	(2.8)
East New Britain	3.4	2.3	4.7	65	83	30
West New Britain	2.3	1.9	3.3	71	89	25
Morobe	3.1	3.6	4.1	92	82	34
Sandaun	2.7	2.8	4.1	76	80	10
Eastern Highlands	2.6	3.8	4.1	85	97	23
Enga	3.7	3.3	7.6	93	100	10
Gulf	3.4	3.1	2.3	100	82	36
NCD	2.8	4.8	6.2	87	83	11
Government	2.5	3.0	5.0	77	86	24
Church	3.3	3.4	3.6	90	86	24

Note: Responses from Head Teacher and Grade 5 surveys.

Performance

In 2002 and 2012 P&C Committee members were asked about the performance of teachers. In both years, about two-thirds thought teachers always or often spent their days teaching, but the percentage responding that teachers were on time fell from 69 to 59 per cent, a significant reduction (Table 3-14). Teachers were most likely to be perceived to be on time in East New Britain and Enga, but most tardy in Morobe and NCD in 2012. Perceptions of government teachers worsened over the decade, while perceptions about church teachers improved. By 2012, perceptions of the latter group were significantly more favourable than of the former.

Table 3-14: Perceptions about teachers from parents/P&C members (%)

Percentage who said teachers always or often…	In class on time each day		Spend days teaching	
	2002	2012	2002	2012
Overall	69%	59%	68%	65%
	(3.0)	(3.1)	(2.4)	(3.0)
East New Britain	60%	84%	73%	87%
West New Britain	82%	72%	82%	74%
Morobe	69%	33%	66%	44%
Sandaun	80%	73%	80%	60%
Eastern Highlands	72%	52%	57%	69%
Enga	48%	80%	57%	83%
Gulf	72%	57%	72%	71%
NCD	39%	23%	57%	46%
Government	76%	50%	66%	57%
Church	60%	74%	72%	77%

Note: Responses from parents/P&C members.

Pay

There are mixed results when it comes to teachers' pay (Table 3-15). On the positive side, more Grade 5 teachers were getting paid at the right grade and paid on time in 2012 compared to ten years before. However, it takes teachers an average of 17 hours to access their pay, which costs them 288 kina per trip. Only one-third of teachers were paid the correct allowances in 2012, unchanged from 2002. There were also a third of teachers who sought additional income from their teaching job in 2002 and 2012.

Table 3-15: Teacher pay

	Paid at proper pay grade (%)		Paid on time (%)		Time taken to access pay (hours)	Cost to access pay (kina)	Paid eligible allowances (%)		Alternative income (%)	
	2002	2012	2002	2012	2012	2012	2002	2012	2002	2012
Overall	52	89	65	85	17	288	35	34	30	27
	(3.9)	(2.0)	(3.3)	(2.0)	(2.0)	(47)	(3.5)	(3.1)	(2.8)	(3.2)
East New Britain	42	87	70	97	8	70	27	38	42	57
West New Britain	86	94	65	75	23	767	45	25	23	31
Morobe	52	92	75	82	32	291	33	24	50	22
Sandaun	43	90	32	73	22	517	4	17	21	27
Eastern Highlands	53	93	67	100	4	86	39	67	21	17
Enga	40	83	87	93	3	32	30	17	8	10
Gulf	44	78	48	63	14	220	67	56	35	22
NCD	56	75	80	96	2	10	83	63	20	39
Government	55	86	70	89	15	272	35	37	32	24
Church	46	94	57	83	22	328	31	32	30	29

Notes: From Grade 5 teacher survey.

3.6 Formal oversight, community engagement and school management

Schools are subject to two types of oversight to promote accountability and transparency. The first is from government officials – including Standards Officers, and District Education Officers and Advisors. The second comes through the community via the BoM and P&C Committee. In this section we look at the effectiveness of these types of oversight and how they have changed over time. We also examine the way schools are internally managed.

Government oversight

In the Universal Basic Education Plan (2010 to 2019), the NDoE aims to have 80 per cent of schools receiving a Standards Officer visit by 2019. Our findings suggest that there is still a way to go before this goal is realised. Table 3-16 shows the percentage of head teachers that said that their schools received a visit from a Standards Officer. It also shows that, on average, just over half of schools received a visit from a Standards Officer in 2001, and two-thirds in 2011 and 2012, a

statistically significant increase. In 2012, NCD and Enga had the highest rate of inspections; West New Britain had the lowest, with less than half of schools reporting a Standards Officer visit. Church and government schools were similarly likely to receive a visit across the three years. On average, the number of Standards Officer visits was similar in 2001, 2011 and 2012 (the dip in visits in 2012 can be explained by the timing of the survey, which occurred late in 2012). Visits were more frequent in Enga and NCD in all three years. There was little difference between government and church schools, but in all years the more remote schools received fewer visits.

81 per cent of schools received a visit in either 2011 or 2012, suggesting that the NDoE target is currently being met over a two-year rather than an annual interval.

In 2012, 62 per cent of Standards Officers observed classes, slightly up from 58 per cent in 2002. More Standards Officers checked school records: from 56 per cent in 2002 up to 68 per cent in 2012. We look at how often the Standards Officers check subsidy payments in Chapter 5.

Table 3-16: Percentage of schools with at least one Standards Officer visit; number of visits per year

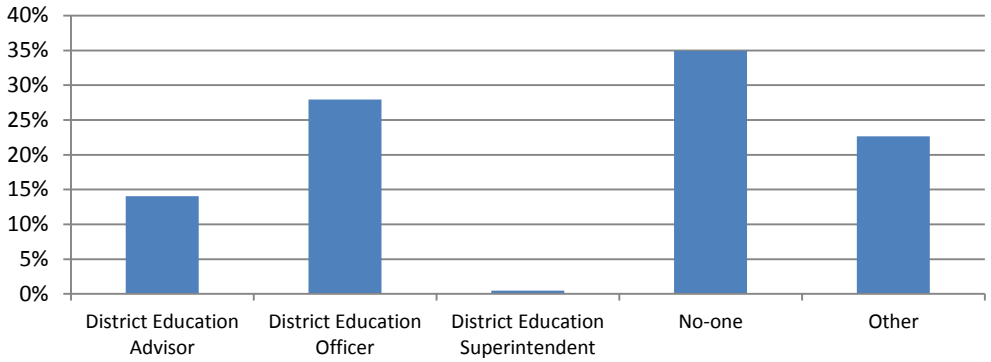
	One or more visit per year (%)			Number of visits		
	2001	2011	2012	2001	2011	2012
Overall	56	65	64	1.3	1.5	1.2
	(3.1)	(3.0)	(3.0)	(0.1)	(0.1)	(0.1)
East New Britain	57	72	72	1.1	1.6	1.6
West New Britain	50	42	48	1.2	1.0	0.7
Morobe	43	73	60	1.3	1.3	0.8
Sandaun	70	65	65	1.0	1.3	1.3
Eastern Highlands	55	58	58	1.3	1.3	0.9
Enga	80	87	87	2.1	2.5	1.9
Gulf	34	43	62	0.6	1.1	1.2
NCD	80	83	87	3.8	3.9	3.8
Government	57	64	62	1.4	1.4	1.1
Church	57	66	67	1.2	1.5	1.2
Readily accessible	76	68	68	2.4	2.0	1.8
Accessible	58	70	74	1.3	1.8	1.2
Remote	43	60	60	0.8	1.2	0.7
Very remote	54	61	70	0.9	1.0	0.9

Notes: Number of visits calculated based on all schools – not just those visited by a Standards Officer. As some schools received no visit the average can drop below one, as it does in Gulf. The overall average number of Standards Officer visits out of only those schools that received a visit increased from 1.9 in 2001 to 2.1 in 2011.

In 2012 we asked who else besides the Standards Officer inspected the school, a question not included in the 2002 survey. 65 per cent of Head Teachers said someone other than the Standards Officer inspected the school in 2012; mostly the school was visited by a District Education Officer (Figure 3-9). The District Education Officer and District Education Advisors are different from the Standards Officers as they

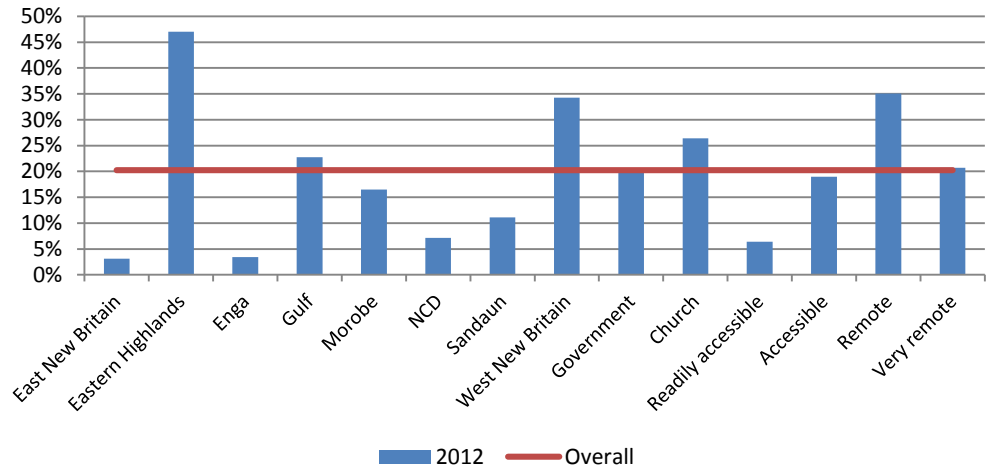
report to the provincial administration, the latter reports to the NDoE. A third of respondents said that no-one else inspects the school.

Figure 3-9: Other than the Standards Officer, who else inspects the school (2012, %)?



Overall, Figure 3-10 shows that 20 per cent of schools did not receive an inspection from anyone in 2012, neither from the Standards Officer nor anyone else. Eastern Highlands and West New Britain were least likely to receive a visit. On the other hand, over 90 per cent of schools in East New Britain and Enga received a visit. Schools in readily accessible locations were more likely to receive a visit.

Figure 3-10: Percentage of schools without an inspection from anyone (2012)



Community engagement

As outlined in Chapter 1, the BoM and P&C Committee play a critical role in school governance. Table 3-17 shows the make-up of the BoM and P&C associations and details about attendance. As Chapter 1 notes, the BoM should consist of at least seven members. On average this minimum was exceeded: in 2012, there were on average 8 members, in 2002, 8.8. The percentage of women on the BoM remained the same over the decade: one-fifth of BoM members were female. In addition, more BoM members were parents of children in 2012 compared to 2002. The average BoM in our sample met four times

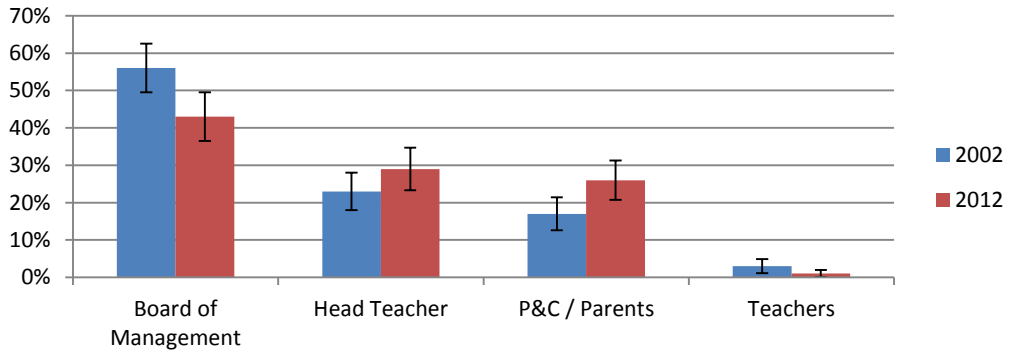
annually in both 2001 and 2012. Nearly all schools had a P&C Committee in 2002 and 2012 and, on average, they met three times annually in 2001 and 2012.

Table 3-17: The BoM and P&C by the numbers

Response	%/#	Value
Average number of BoM members (2002)	#	8.8
Average number of BoM members (2012)	#	8.0
Percentage of female BoM members (2002)	%	23
Percentage of female BoM members (2012)	%	22
Percentage of BoM members parents (2002)	%	32
Percentage of BoM members parents (2012)	%	38
Number of BoM meetings on average (2001)	#	4.0
Number of BoM meetings on average (2012)	#	4.0
Schools with a P&C Committee (2002)	%	95
Schools with a P&C Committee (2012)	%	96
Number of P&C meetings (2001)	#	3.7
Number of P&C meetings (2012)	#	3.9

While P&C Committees are meeting, members do not have much say in determining the P&C's activities. According to the Head Teacher, the BoM, followed by the Head Teacher, had the most say over P&C activities (Figure 3-11).

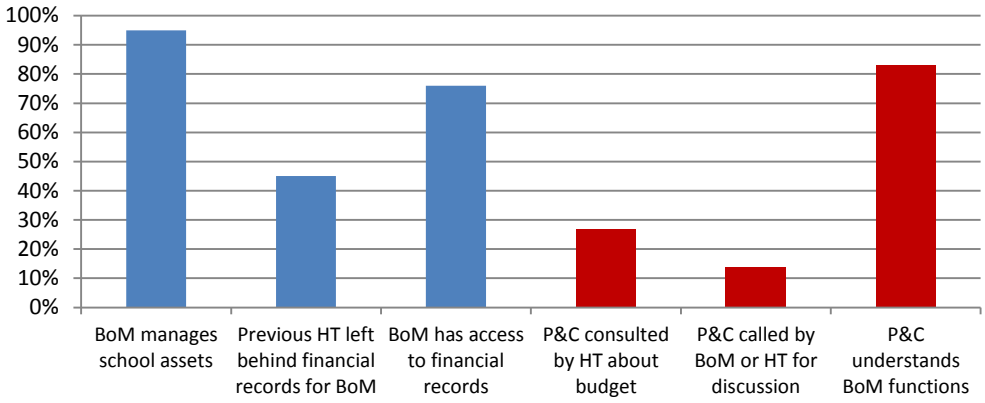
Figure 3-11: Most say over P&C Committee activities



There are also some mixed results regarding the involvement of the BoM and P&C Committees in managing school finances. As highlighted in Figure 3-12 (which presents responses from BoM and P&C Committee members), 95 per cent of BoM respondents said they managed school assets, but only 76 per cent said that they were provided with reasonable access to financial records. The critical job that the BoM plays in helping to manage school finances is further hampered when Head Teachers leave. Less than half of all respondents from the BoM said Head Teachers left behind financial records when they left the school. The P&C Committee's level of engagement in budgeting is even worse. Only 27 per cent said they were consulted about the budget and 14 per cent said they were called to discuss school issues with the BoM or Head Teacher. Despite this, P&C Committee members appear to have a grip on the way community

oversight is supposed to work: over 80 per cent said that they understood the BoM's functions.

Figure 3-12: The BoM and P&C access and management of finances (%, 2012)



Notes: First three responses from BoM survey, second three from P&C.

Despite its constraints, there are signs that the BoM is functioning well – though there is room for improvement. Two-thirds of P&C members believed the BoM had effectively managed the school in 2012, 10 percentage points down from 2002 (Table 3-18). In 2012 respondents in Enga and Sandaun were particularly enthusiastic about the BoM's management: in both these provinces almost 90 per cent of respondents in believed the BoM was well managed. This is in stark contrast to Eastern Highlands (25 per cent), NCD (48 per cent) and Gulf (51 per cent).

Table 3-18: Parents and P&C views on the BoM

	BoM is effectively managed (%)	
	2002	2012
Overall	77	67
	(3.2)	(4.2)
East New Britain	75	67
West New Britain	75	77
Morobe	76	75
Sandaun	77	87
Eastern Highlands	80	25
Enga	85	87
Gulf	76	51
NCD	48	48
Government	74	63
Church	79	72

Notes: From P&C survey.

Community interaction with the school has been shown to be an important contributor to successful schools in PNG (World Bank and NRI, 2004) and in other developing countries (World Bank, 2009). The proportion of P&C members and parents who said that the Head Teacher interacted with the community was stable over the decade. In

2002 46 per cent said that the Head Teacher mixes with the community, compared to 49 per cent in 2012.

School management

Within schools, there has been a decentralisation of decision making over the past ten years. By 2012 twice as many Head Teachers and a third more Grade 5 teachers said Head Teachers dominated decisions about class size (Table 3-19). This came at the expense of those external to the school (National Government, Standards Officers, Provincial Government). When it came to evaluating student performance, teachers were in charge in 2012, followed by Head Teachers. Teachers' say in student performance increased over the decade, while Head Teachers' involvement declined. This is probably a result of larger schools, which requires the Head Teacher to delegate more.

Table 3-19: Most say on class size and student performance (%)

Most say on…	Deciding class size				Evaluating student performance			
	Head Teacher		Grade 5 teacher		Head Teacher		Grade 5 teacher	
	2002	2012	2002	2012	2002	2012	2002	2012
BoM	1	11	11	16	3	2	4	3
District government	1	2	4	1	0	0	1	1
Head Teacher	37	72	44	63	52	37	37	30
National government	23	1	9	3	1	0	-	-
P&C / parents	0	1	0	1	0	1	0	0
Provincial government	6	2	14	4	2	1	3	0
Standards Officer	19	2	5	0	5	1	3	2
Teachers	15	9	14	12	37	54	51	63
Other	0	0	0	0	0	3	2	1
Total	100	100	100	100	100	100	100	100

Notes: From Head Teacher and Grade 5 teacher surveys.

This decentralisation of decision making is also apparent in aspects of human resource management. Table 3-20 shows that the Head Teacher is playing a much stronger role in evaluating teacher performance and in-service training selection. The Head Teacher was the key decision maker in these areas in 2012. Decentralisation has meant that the role of provincial governments in schools has declined across the board, although they still have the most say in teacher appointments (Table 3-20).

Table 3-20: Most say on human resources (%)

Most say in…	Appointing a teacher				Evaluating teacher performance				Selection for in-service training			
	Head Teacher		Grade 5 teacher		Head Teacher		Grade 5 teacher		Head Teacher		Grade 5 teacher	
	2002	2012	2002	2012	2002	2012	2002	2012	2002	2012	2002	2012
BoM	3	16	7	24	3	4	3	20	0	1	0	7
District government	5	12	2	7	0	3	0	1	1	4	1	3
Head Teacher	1	8	3	8	42	73	43	57	17	60	28	52
National government	8	1	7	1	2	0	1	0	5	0	4	0
Other	7	16	3	12	0	3	1	2	0	6	0	2
P&C / parents	2	0	1	0	0	0	0	0	0	0	0	0
Provincial government	71	35	74	24	6	0	5	0	47	7	41	5
Standards Officer	2	12	2	23	45	16	46	17	28	17	21	19
Teachers	0	1	1	0	1	1	1	2	2	5	5	11
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Notes: From Head Teacher and Grade 5 teacher surveys.

3.7 School funding

Funding at the school level has improved substantially and significantly over the decade. Table 3-21 shows that, adjusted for inflation, schools received 112 per cent more per student in 2012 than in 2001. (We use 2001 for comparisons because 2002 was an exceptional year, due to the temporary abolition of tuition fees.) With more students, the average school received 150 per cent more funding. Not all provinces fared well over the decade however; Gulf saw a drop in revenue per student; in NCD funding per student was essentially the same.

Table 3-21: Revenues per school and per student

	Revenue per school			Revenue per student		
	2001	2012	Growth	2001	2012	Growth
Overall	35,031	87,486	150%	159	336	112%
	(6,972)	(6,490)		(11)	(21)	
East New Britain	28,579	89,491	213%	170	357	110%
West New Britain	50,284	82,228	64%	193	342	78%
Morobe	22,541	65,588	191%	198	463	133%
Sandaun	12,469	55,135	342%	129	306	137%
Eastern Highlands Province	18,420	97,241	428%	110	268	144%
Enga	38,226	147,297	285%	133	286	115%
Gulf	9,920	27,069	173%	173	155	-10%
NCD	204,226	309,248	51%	281	292	4%
Government	34,816	91,498	163%	136	344	162%
Church	35,529	81,425	129%	180	326	46%
Readilly accessible	85,065	205,479	142%	179	332	61%
Accessible	25,285	111,339	340%	150	316	127%
Remote	15,478	72,623	369%	146	240	28%
Very remote	11,838	36,515	208%	160	399	77%

Notes: Total revenue and revenue per student are measured in 2012 kina. Revenue per student is calculated as the ratio of total revenue to enrolled students within each school. One school in Morobe and the very remote category reported receiving grant funding from the National Government of 200,000 kina or 2632 kina per student; removing this effect reduces revenue per student in Morobe to 366 kina and for the Very Remote category to 313 kina.

Due to the Tuition Fee-Free (TFF) policy, which is examined in Chapter 5, schools received 82 per cent less from parents, or K58 (Table 3-22). Funding from provincial governments is more or less unchanged, but at only K7 per student. The reduction in fee income has been more than compensated for by massive increases in national government funding of K201 per student, as well as a smaller increase (K35) from other actors, such as donors and churches. Schools are not just better off because of the abolition of tuition fees in 2012, and large increase that year in subsidy payments. Rather our more detailed analysis in Chapter 5 of the TFF policy (see Table 5-2 and related discussion) suggests that schools have seen their financial position significantly improve over a number of years.

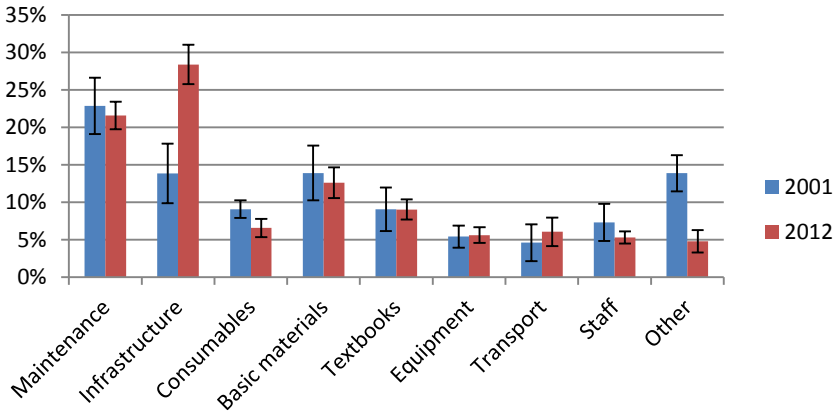
Table 3-22: Revenues per student by source

Source of revenue:	2001	2012	Growth
Parents	70	12	-82%
	(8)	(1)	
National Government	48	249	419%
	(3)	(9)	
Provincial Governments	7	7	-11%
	(2)	(2)	
Other (donors, church, other government, etc.)	33	68	103%
	7	(19)	
Total	159	336	112%
	(11)	(21)	

Notes: The data are measured in 2012 kina. Standard errors are in parentheses. Revenue per student is calculated as the ratio of revenue to enrolled students within each school.

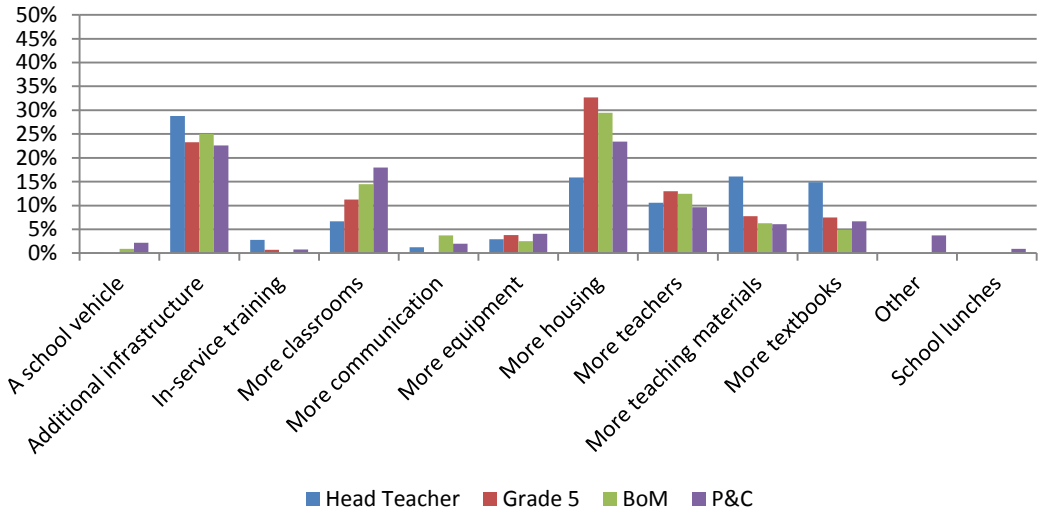
What are schools spending all this money on? According to the Head Teachers, spending on infrastructure has increased markedly over the decade to become the largest spending item in 2012 (Figure 3-13). Maintenance was the second largest spending item in 2012, similar to 2001 levels. Basic materials used to aid teaching as well as textbooks were also popular items in 2001 and 2012.

Figure 3-13: Percentage of school spending by category



Even though infrastructure was already the number one spending category, when asked what they would purchase if more funding was available, respondents wanted even more infrastructure (including teachers' housing and classrooms). Most Head Teachers said additional infrastructure was their number one priority, while Grade 5 teachers and representatives of the BoM selected teachers' houses as most important (Figure 3-14). General infrastructure and teachers' houses were of similar importance for those from P&C Committee. More classrooms, teachers, teaching equipment and textbooks were also popular options; school vehicles, in-service training, communication, equipment and school lunches were not.

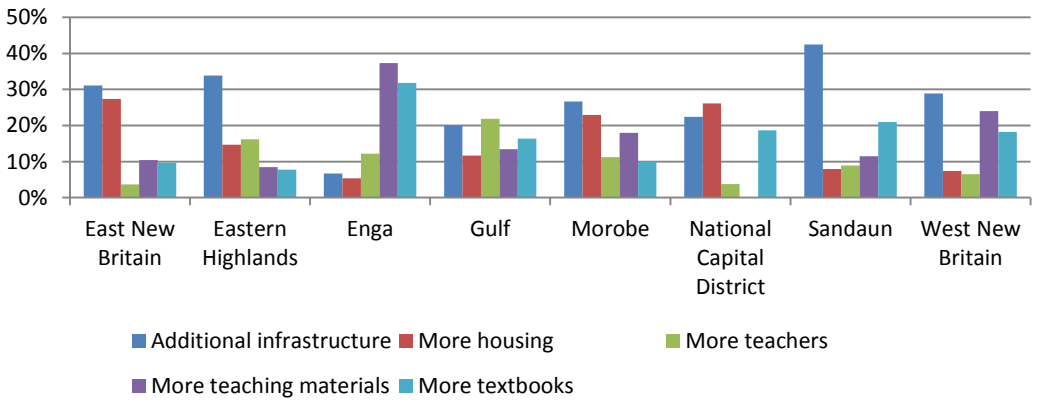
Figure 3-14: First preference for spending by respondent (2012)



Notes: From the Head Teacher, BoM, Grade 5 teacher and P&C surveys.

Funding preferences differed significantly by province, as Figure 3-15 highlights. Head Teachers wanted additional infrastructure in East New Britain, Eastern Highlands, Morobe, Sandaun and West New Britain. In Enga teaching materials were most desired, NCD prioritised teachers' houses, while Gulf wanted more teachers.

Figure 3-15: First preference for spending by province (2012)



Notes: From the Head Teacher survey.

3.8 Conclusion

Between 2002 and 2012 schools benefitted from some significant improvements in access to infrastructure: it is now easier to get to a PMV, get to mobile coverage, and get to a road. At the same time, in Gulf and East New Britain it is harder to get to a bank, operating airstrip, and a trade store to buy building supplies. These obstacles disadvantage schools and require whole–of-government solutions. Part of the solution may be technical. For example, mobile phones can be used to provide teaching plans as well as banking services to teachers and school administrators in remote locations. Addressing these constraints will also involve promoting equitable economic development and providing improved infrastructure, such as roads. Clearly, the problems that schools face are in part determined by government departments other than the NDoE.

There is much to be learnt from places that have overcome these obstacles. In this study, East New Britain offers an example of a province that faces problems in access to key resources yet has managed to perform well in terms of other education indicators (for example, teachers are most likely to be on time and teach). More research is needed to understand why places like East New Britain overcome their obstacles while others do not.

Schools now have significantly greater funding at their disposal, with most of the increase coming from the national government. Increases in revenue are important, but more needs to be done to ensure that it is spent well. Standards Officers need to be visiting more frequently. BoM members and P&C Committee members should be more involved in overseeing spending.

Increases in demand show that more parents want to send their children to school, a good outcome. But policy makers need to be wary of the affect that increasing student absenteeism has on access to education – our findings suggest that absentee rates are increasing and, in turn, undermining the impact of enrolment increases. Addressing student absenteeism should be prioritised by policy makers; it is an issue that is currently not given sufficient attention.

According to our results, more teachers were regularly working in 2012, and the number of ghost teachers has fallen, but these positive developments have not been enough to make up for increased enrolments. More teachers are needed. The consequences of the pressure placed by enrolment increases on infrastructure and human resources are further investigated in Chapter 5.

Teachers also need to be better motivated. It is noticeable that teachers at church schools score significantly higher in terms of the community perception of the time they spend teaching, and whether they turn up on time. Our survey also highlights two key issues which are sure to add to teacher dissatisfaction and that need attention from policy

makers: non-payment of allowances and the poor state of teachers' houses.

Supporting teachers' concern about their living conditions, there is great support for further spending on infrastructure more generally. The importance of addressing infrastructure needs is witnessed in the high proportion of teachers' houses and classrooms that needed to be rebuilt in 2012. Funding should be set aside to build infrastructure, but in order to see improvements over the coming years it is important to also focus on maintaining existing infrastructure. This will mean bolstering recurrent funding. Chapter 9 shows that that the national government's development budget has been given increasing priority over the last decade. This is also happening at the school level where more funding is spent on infrastructure than maintenance.

In sum, our analysis suggests that the education sector has not experienced a "lost decade". In some cases, an improvement in one area (for example, access to water) has been countered by a decline in another area (absenteeism). In other cases, positive and negative outputs are intertwined. For example, increased enrolments have put pressure on school infrastructure. But overall the last decade for education was one of expansion.

Chapter 3 Annex

Table 3-A1: Summary statistics and tests of difference for education variables, 2002 and 2012

		2002			2012			Test-
		N	mean	SE	N	mean	SE	statistic
Students								
Enrolments	no.	182	186	13.4	207	294	18.5	4.7
Share of girls in enrolments	%	187	30	0.7	195	46	1.7	8.8
Grade 5 attendance rate	%	175	84	1.2	201	71	2.1	-5.4
Grade 5 missed more than 10 days in Term 3	%	174	9	1.0	202	18	1.2	5.8
Most children in community attend school	%	204	62	3.2	212	70	4.0	1.6
Classrooms								
Number	no.	206	6.9	0.4	216	8.4	0.3	3.0
Made of permanent materials	%	206	63	2.3	216	73	2.0	3.3
Needing rebuilding	%	206	32	2.1	216	32	1.9	0.0
Needing maintenance	%	206	38	2.0	216	41	2.3	1.0
With chair & table for teacher	%	204	44	2.8	216	74	2.3	8.3
Enrolled students/functioning classroom	no.	182	38	2.6	197	53	5.8	2.3
Facilities								
Year-round drinking water	%	198	58	3.2	214	72	2.8	3.3
Enough female toilets	%	188	56	3.4	214	61	3.1	1.0
Schools with electricity	%	209	15	2.4	205	27	3.0	3.1
Infrastructure index	%	199	54	1.2	216	60	1.3	3.3
Teachers								
Positions	no.	206	7.9	0.6	215	9.6	0.7	1.8
Working	no.	205	6.5	0.7	216	8.7	0.7	2.2
Paid at grade	%	145	52	3.9	198	89	2.0	8.4
Paid allowances	%	168	35	3.5	197	34	3.1	0.0
Teacher usually on time	%	203	69	3.0	212	59	3.1	-2.3
Teacher usually teaching	%	204	69	2.4	211	65	3.0	-1.1
Students per (working) teacher	no.	181	31	1.5	207	36	1.6	2.3
Teacher housing								
Number	no.	206	5.2	0.2	216	6.8	0.4	3.5
Teacher positions per functioning house	no.	206	2.5	0.3	215	2.6	0.3	0.2
Made of permanent materials	%	206	48	1.2	216	58	2.0	4.3
Needing rebuilding	%	205	32	1.2	216	32	2.8	0.0
Needing maintenance	%	205	36	2.2	216	39	2.1	1.0
Textbooks								
Average per subject per grade	no.	161	29	1.9	194	34	2.0	1.7
Average students per textbook	no.	197	2.0	0.3	198	2.2	0.3	0.4
Sufficient textbooks	%	175	24	3.1	203	31	2.8	1.7
Accessibility								
Time to get to a bank	hrs.	197	3.9	0.4	216	5.3	0.7	1.7
Time to acquire mobile reception	hrs.	177	1.9	0.3	216	0.9	0.2	-2.8
Remoteness index	hrs.	185	3.0	0.3	214	3.5	0.4	1.0
Supervision by Standards Officer (SO)								
At least one SO visit a year	%	214	56	3.1	216	64	3.0	1.9
SO checked records	%	168	56	3.6	201	68	3.0	2.6
SO submitted report	%	171	65	3.4	216	80	2.5	3.5
SO observed classes	%	174	58	3.5	201	62	3.2	0.9
Board of Management (BoM)								
BoM meetings	no.	179	4.0	0.2	213	4.0	0.2	0.0
BoM membership	no.	206	8.8	0.2	216	8.0	0.2	-2.8
BoM effective	%	196	77	3.2	196	67	4.2	-1.8
Most say over school subsidy	%	205	48	3.2	215	67	3.0	4.3
P&C Committee								
Schools with P&C	%	207	95	1.4	216	96	1.3	0.5
P&C meetings	no.	189	3.7	0.2	199	3.9	0.3	0.6

		2002			2012			Test-
		N	mean	SE	N	mean	SE	statistic
School revenue								
Total revenue	2012 kina	139	35,031	6,972	196	87,486	6,490	5.5
Total revenue per student	2012 kina	89	159	11	188	336	21	7.5

Notes: Test-statistic is calculated as the difference in the mean between 2012 and 2002 divided by the standard error of the difference in the mean, which in turn is calculated as the square root of the sum of squared standard errors for each year. A test-statistic (in absolute value) greater than 1.65 indicates a statistically significant difference in means at the 10% significance level, and greater than 1.96 indicates a significant difference at the 5% significance level (based on a two-tailed t-test). For definitions of variables see Table 1 in the Summary. A few variables are for 2001 rather than 2002: see the notes to Table 1 in the Summary for details.