

Education Workforce Costed Options Paper

Executive Summary

This paper is the final in a series developed by Fab Inc. (on behalf of the Education Commission), to help the Teaching Service Commission (TSC) strengthen further the education workforce. It is part of the wider [Education Workforce Initiative](#) (EWI) and builds on the [Transforming the Education Workforce](#) report. Sierra Leone has been a key partner in this initiative. This work builds on a phase one scoping study that focused on options to strengthen the workforce. The other papers in this series cover: Education Workforce Management, Education Workforce Spatial Analysis, Education Workforce Supply and Needs and Education Workforce Recruitment and Matching.

This paper summarises the costs of the options identified throughout the series of papers developed by Fab Inc. (on behalf of the Education Commission), to help the Teacher Service Commission strengthen the education workforce in Sierra Leone. Given the global pandemic which emerged while the studies were being finalised, we also identify which of the options are particularly relevant for this context in terms of school closures and reopening.

These costed options are focused on increasing the number of qualified, specialised and effective teachers in all schools, and particularly in remote schools where these challenges are greatest. There are two broad approaches to overcoming this challenge in remote areas: encouraging qualified teachers to move and work in these schools, or supporting those already living and working in those areas to gain the required teaching qualifications and skills. These are not intended to be mutually exclusive, and a combination of options and approaches is likely to be most effective in meeting these challenges.

For each option, detail is provided on the key programming decisions and potential piloting options, and the costs, risks and benefits arising from these options. In each case, these could be scaled up further depending on the available budget and desired targeting. In all cases, these options are based on local and international evidence and have been adapted and designed for implementation in Sierra Leone.

Education Workforce Initiative Overview

This paper is the final in a series developed by Fab Inc. (on behalf of the Education Commission), to help the Teaching Service Commission further strengthen the education workforce. It is part of the wider [Education Workforce Initiative](#) (EWI) and builds on the [Transforming the Education Workforce](#) report. Sierra Leone has been a key partner in this initiative. This work builds on a phase one scoping study that focused on options to strengthen the workforce.

The second phase provides succinct evidence products on specific research areas to guide a policy dialogue on aspects of the education workforce in Sierra Leone, to be held in Freetown. Figure 1 summarises the relationship of these papers to each other:

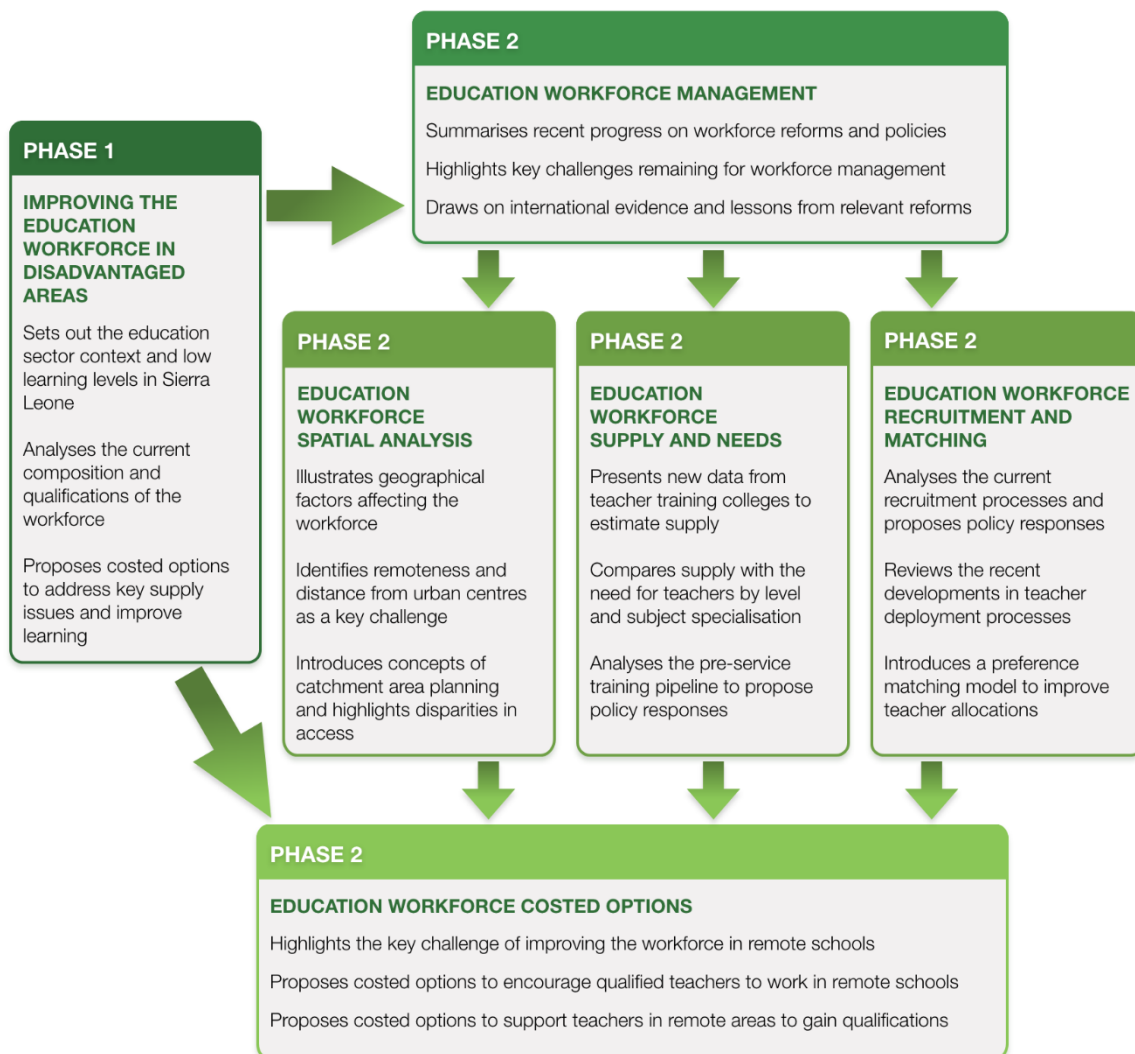


Figure 1: Education Workforce Initiative - Sierra Leone papers

Overview of costed options for improving the education workforce in remote schools

One of the biggest challenges in Sierra Leone is how to get a qualified, specialised and effective workforce across *all schools* – particularly in remote schools. There is a noticeable fall in the number of qualified teachers in remote schools that are more than an estimated hour's walk from urban centres. This challenge can be seen in a number of key markers including pupil-teacher ratios; pupil-qualified teacher ratios; and learning outcomes within the schools.

We have identified two sets of options to overcome this challenge:

1. Encourage qualified teachers to move to and work in these schools, or;
2. Support those already living and working in the remote areas to gain the required teaching qualifications and skills.

A range of potential options have been discussed by EWI, TSC and other stakeholders, which are shown below. We try to bring these together into a coherent set and generate costed proposals for action.

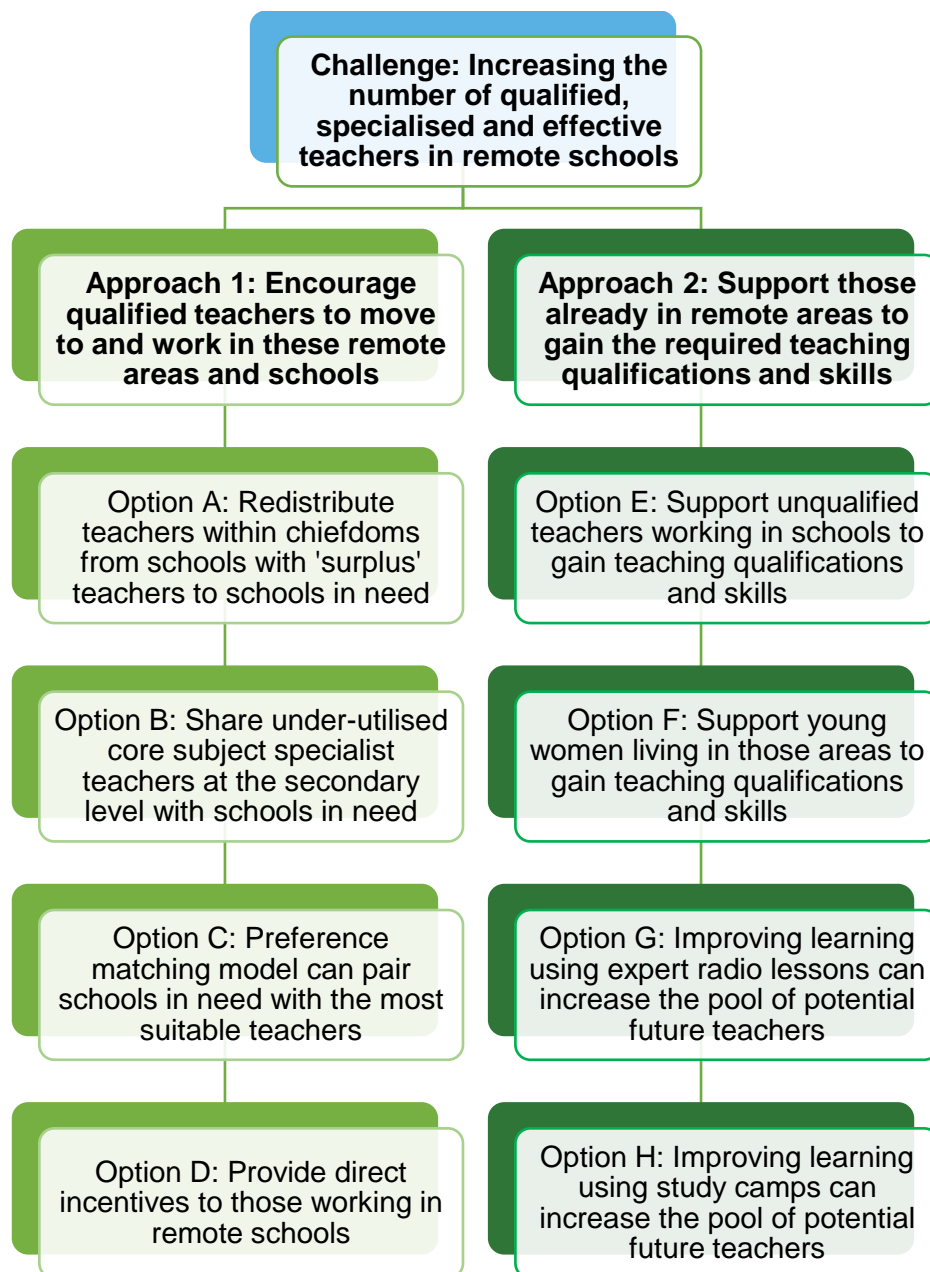


Figure 3: Summary of headline costs for the presented options

The headline cost figures are summarised below, with greater detail provided in the relevant sections. Total costs of a pilot or initial scale-up are presented, which vary in size for each option - each option could also be scaled up and implemented more widely. We do not include here any wider costs, such as for monitoring or evaluation, which should be relatively similar for any intervention.

The estimated direct costs for *implementing* these proposals are presented in this paper. However, in options involving improving the allocation of existing teachers, these policies can result in a more efficient allocation of resources and therefore could reflect cost savings compared to simply hiring additional teachers to payroll. They have also been costed to include incentives to induce participation, which are the main cost drivers.

Unfortunately, while we can look at the relative cost of the options, no evidence exists on the effectiveness of the options in a simple comparable way – meaning simple comparisons of their likely impact (on areas such as access or learning), are difficult. That given, we can identify possible routes through which the benefits will flow – from reducing ratios to improving the quality of teaching within fixed ratios.

A confounding challenge in the Sierra Leone context is that only approximately 40% of teachers are on government payroll. *It is harder to manage and hold teachers accountable when you are not paying their salaries.* Increasing the number of teachers on salary is a necessary aim, but the long-term nature of salary and pension liabilities from adding a teacher to payroll means that this option requires prolonged negotiation with the Ministry of Finance. The options presented assume payroll numbers are held the same – though obviously all options would be strengthened by increasing the numbers of payroll.

	Benefit	Number and type of units	Annual Cost	Average cost per unit	Additional considerations
Approach 1: Encourage qualified teachers to move to and work in remote areas and schools					
Option A: Redistribute teachers within chiefdoms from schools with 'surplus' teachers to schools in need	More equitable PQTRs, greater efficiency	1,105 teachers redistributed	269,392 USD (one-off)	244 USD per teacher	Potential cost-savings compared to new hiring
Option B: Share under-utilised core subject specialist teachers at the secondary level with schools in need	More equitable access to subject specialists, greater efficiency	186 teachers shared	28,864 USD	155 USD per teacher	Potential cost-savings compared to new hiring
Option C: Preference Matching Model can pair schools in need with most suitable teachers	More equitable PQTRs and subject specialist access, likely to lead to greater retention				Requires development
Option D: Provide direct incentives to those working in remote schools	More equitable PQTRs			To be agreed during phase three	Requires development
Approach 2: Support those already in the remote areas to gain the required qualifications and skills					
Option E: Support unqualified teachers working in schools to gain teaching qualifications and skills	Improved PQTRs and improved teaching	1,021 teachers qualifying over 3 years	321,610 USD	315 USD per teacher	
Option F: Support young women living in remote areas to gain teaching qualifications and skills	Improved PQTRs, increased female teachers and improved teaching	1,500 teachers qualifying over 4 years	1,131,313 USD	754 USD per teacher	Already piloted in Sierra Leone
Option G: Improving learning through expert radio lessons	Improved teaching in disadvantaged schools	600 classes with expert radio lessons	145,563 USD	243 USD per class / 6 USD per child	Particularly relevant in Covid context
Option H: Improving learning using study camps focused on foundational learning	Improved foundational learning in disadvantaged schools	81 study camps	21,503 USD	265 USD per study camp / 1 USD per child	Particularly relevant in Covid context
Note: Annual cost and average cost are presented here for the first year and/or the average year; costs are sensitive to assumptions on children covered per teacher; see below for further details.					

Options A, B, E and F can all be summarised by a cost per teacher - though the activities differ - in that the teacher is redistributed to another school (Option A), shared between two schools (Option B), or supported to gain qualifications and skills (Options E and F).

Of these, the cost per teacher is largest for Option F. However, this is also the only option that is targeted entirely at remote areas, involves the most extensive coaching, benefits an additional aspect in increasing female teachers, and is based on an existing programme, making this the most reliable option for estimating costs and scaling up.

Options A, B and E can all benefit remote areas and schools, but depending upon the piloting and roll-out might not focus exclusively on these areas. Of these three, it is unsurprising that the lowest costs are for sharing existing teachers on payroll across schools (Option B), followed by redistributing teachers that again are already on payroll to different schools (Option A), and the highest costs are for supporting unqualified teachers to gain qualifications and skills (Option E).

Options C and D were included for completeness, based on the initial development of the Preference Matching Model (Option C) and stakeholder discussions of interest in incentives (Option D). However, both of these options require further engagement and development before being ready for implementation. These are being taken forward in a future phase of work.

Options G and H are similar ideas, but with differing delivery mechanisms. Option G is costed per class provided with recorded audio lessons, whilst Option H is costed per primary school provided with a two-week remedial study camp. As a result, whilst Option H would work out at a lower cost per class reached, this would be a shorter-term intervention.

Options with particular relevance to the Covid-19 response

Options G (remote audio lessons) and H (short term study camps) are particularly relevant for trying to increase learning and resilience in the current Covid-19 context. The use of radio lessons as part of the distance learning programme during school closures has already built up a bank of lessons, and experience of students in listening to recorded audio lessons. Taking this forward and integrating it into the classroom, with teachers facilitating, is a useful step when schools reopen for ensuring quality lessons are being provided across the country.

Similarly, the intensive remedial study camps in option H can be particularly useful in recovering some of the learning loss during these school closures, and can be targeted to areas that are likely to have been affected the most. This may be due to lower radio ownership or signal coverage restricting access to the radio lessons. Alternatively, these could also be targeted at schools that had the greatest dropout and challenges after the Ebola crisis, or at schools with a poor recent history of exam results. As a result, there is

significant potential for using options G and H in particular to reduce inequalities, build resilience, and improve learning in the Covid-19 response and school reopening plans.

Next steps

The EWI Sierra Leone team have been asked to continue supporting TSC to help them further improve their policy making, and will continue this support through until March 2021. As part of this, the options in this paper will be discussed with key stakeholders, to inform the Covid response, and the post-Covid recovery period.

Approach 1: Encourage qualified teachers to move to and work in remote areas and schools

The first approach considered focuses on how the existing qualified workforce can be encouraged to move to, and work in, remote areas and schools. This aims to leverage the workforce currently on government payroll that already have a level of experience and verification.

This will also require consideration of what will happen to those currently working in those remote areas, and how their experience and skills, even if unqualified, can be best utilised going forward, as well as how their potential opposition to these options may also be addressed.

Option A: Redistribute teachers within chiefdoms from schools with 'surplus' teachers to schools in need

Summary

- There is significant variation in class sizes and pupil-teacher ratios across grades and schools. In some cases, there are 'surplus' teachers in that if they were to be moved, this would not cause class sizes to increase above 40.
- In these cases, these teachers could be redistributed to nearby schools where there is a 'shortage' of teachers, where class sizes are currently above 40.
- As teachers will likely oppose moving too far, limiting this redistribution to only schools within the same chiefdom is a politically feasible compromise.

What is it and how does it combat the problem?

This option refers to redistributing teachers from schools where there are 'surplus' teachers to schools where there is a 'shortage' of teachers within the same chiefdom. This is illustrated at the primary level but could be extended for secondary by taking into account subject specialism.

Even at a localised chiefdom level, it is often the case that the schools nearer to the towns, main roads and urban centres have a greater number of teachers, relative to students, than schools that are more remote. Identifying the teachers that can be redistributed without overly affecting the schools they are moved from, can ensure a much more equitable and efficient spread of qualified teachers across all schools.

Programming decisions?

The key decision for policymakers is whether teachers will require compensation or incentives for being redistributed; the level these would need to be set at; and whether these would vary depending upon the groups of teachers being considered. For example, the government is likely to have a greater level of control over teachers that are currently on government payroll, so the compensation or incentive could well be set at a lower level.

In any case, it is also important to consider practically how this will be implemented, who will be chosen to be moved, and how they can be monitored to ensure they do teach at the school they have been directed to work at.

Potential pilot?

Guidelines can be distributed to all schools detailing how to effectively allocate teachers to grades within each school (e.g. to maintain a similar qualified PTR across grades or prioritise particular grades in each school) and how to determine their need for qualified teachers if all teachers were to be responsible for one class. This would facilitate the process of selecting schools with a surplus of qualified teachers as schools are made participants of this process.

As mentioned above, the government is likely to have a greater level of control over teachers that are currently on government payroll, and so this is likely to be the best group for piloting.

How much does it cost?

We indicatively cost out a proposal for redistributing 1,105 teachers on government payroll across primary schools:

1. Developing guidelines for ensuring the efficiency of within-school teacher allocations by grade and sharing these with schools
2. Developing guidelines and a strategy for transferring teachers within chiefdoms, discussing with stakeholders, communicating this with schools and identifying applicable teachers
3. A one-off relocation allowance, of approximately 1.5 times the average monthly salary of a qualified, government payroll teacher

Action	Key activities description	Fixed or Variable	Unit Cost (Le)	Number of Units	Cost (Le Mn)
1	Develop recommendations/guidelines for effective allocation of teachers per grade	One-off Fixed	15,505,545	1	16
	Distribute guidelines to schools	One-off Per school	41,650	6,463	269
2	Develop strategy for transferring teachers within chiefdoms	One-off Fixed	15,505,545	1	16
	Consultation with stakeholders	One-off Fixed	15,505,545	1	16
	Communication of strategy	One-off Per school	41,650	6,463	269
	Recruitment of teachers willing to be transferred	One-off Per teacher	100,000	1,105	110
3	Deployment / reallocation to other schools	One-off Per teacher	1,736,006	1,105	1,918
Total Cost (Le Mn)		One-off Per teacher	2.4	1,105	2,613.7
Total Cost (USD)		One-off Per teacher	244	1,105	269,372

Figure 4: Breakdown of costs for proposed Option A

As well as direct costs, redistributing teachers across schools can also have significant political capital costs. Whilst these can be reduced by limiting the scale of redistribution to within chiefdoms as in this option, it is important to consider the political cost and potential repercussions on other activities. Engaging with teachers and unions will be important.

What are the risks of this option?

The greatest risks of this option involve ensuring that teachers continue to work in the school they are newly placed in. There are previous examples of teachers on payroll relocating to schools and areas that they would prefer to work in, not the ones they are actually paid to work in. It is important that monitoring processes are in place to avoid this situation, and that legal recourse to retrieving the relocation allowance is in place for those that do violate this.

It is also worth noting that this policy is not explicitly targeted at redistributing teachers towards remote areas, but instead ensuring a more efficient allocation. Nevertheless, it is likely and expected that this would contribute a net benefit to remote areas and schools.

What are the potential benefits of this option?

The key benefits of this option are an improved distribution of teachers across grades and schools, to reduce the incidences of very-high PTRs occurring in certain grades and schools. Whilst PTRs at the national level are not too severe, the variation in PTRs can be very large, even within small areas. Smoothing these out, by redistributing teachers from schools where the teachers are not needed to avoid class sizes above 40, to schools where class sizes are above 40, increases the equity of the system and is likely to increase learning outcomes, particularly in remote schools where the ratios are often the worst.

There are also potential cost-savings associated with this option. Compared to hiring an additional new teacher in the in-need school, redistributing an existing teacher is a much lower cost and a more efficient option. For example, if a teacher that is currently on government payroll is redistributed, the unit cost of 244 USD per teacher is significantly less expensive than the average salary of a teacher on payroll of 1,861 USD per teacher (estimated to take into account April 2020 pay rise).

In other words, compared to hiring a new teacher in the disadvantaged school, redistributing a teacher from a school where they are less needed results in a cost saving of 1,617 USD per teacher. Across the 1,105 teachers suggested teachers to pilot with above, this would result in a cost saving of 1,786,510 USD compared to adding new teachers to payroll. Compared to the initial cost of 269,372 USD, this is equivalent to a net-saving of more than 1.5 million USD over additional hiring.

Option B: Share under-utilised core subject specialist teachers at the secondary level with schools in need

Summary

- At the secondary level, there are significant shortages of teachers with core subject specialisms (notably English, maths and science teachers).
- As with Option A, there are often cases of both over- and under-supply within the same areas. This is particularly relevant at secondary, where the working hours of a teacher can vary based on how many individual classes they are assigned.
- Subject specialists with less than half of their time scheduled (working hours below 20 per week) could be shared with nearby schools that do not have those subject specialists.

What is it and how does it combat the problem?

Remote schools have the greatest shortage in core subject specialists at the secondary level. However, there are often schools not so far away that have subject specialists in those areas that are currently under-utilised. Sharing these subject specialists across both schools can help to reduce the current shortage.

Programming decisions?

As with Option A, the key financial decision for policymakers is whether teachers will require incentives for increasing their workload, the level these would need to be set at, and whether these would vary depending upon the groups of teachers being considered.

There are a number of practical policy considerations. Firstly, it will also be important to clearly designate the management of the teacher and have monitoring procedures in place to ensure the teacher is correctly turning up at both schools. At a more localised level, this should be supported by ensuring coordination of the timetabling to enable the teacher to balance classes at both schools, for example with scheduling classes at each school on alternating days or at one school in the morning, and the other school in the afternoon. Care should also be taken that teachers' other duties, such as administrative tasks, are considered and that teaching loads do take aspects of travel time into account, for example. Ideally this is done in a way so teachers can streamline lesson planning (i.e. not have to do the whole thing twice but teach the same course in both locations).

A final consideration is the need to test against civil service rules related to seniority and teaching load. Underutilisation can often be hardwired into the contract of a very long serving teacher or be culturally expected. TSC should work with the Teacher Unions to ensure buy-in for any pilot phase.

Going forward, it is possible that technology could be incorporated across this process to potentially reduce travel, extend sharing and improve monitoring. Here the specialist can visit less frequently, and/or act as a mentor for the unqualified teachers.

Potential pilot?

As with option A, the government is likely to have a greater level of control over teachers that are currently on government payroll, so the compensation or incentive could well be set at a lower level. As a first step, we used strict criteria to identify potential 'shareable teachers'. We focus on the key subjects of English, Maths and Science at the Junior and Senior secondary levels and exclude private schools. For each school level, we identified:

- the closest school by distance
- The 'hours taught' per teacher. We classify a teacher as having capacity if they teach 20 hours or less.
- A reasonable distance to travel between schools – we set this at 5km assuming one hour walking is a natural barrier.

This identifies a minimum of 186 'shareable teachers' on the government payroll. Depending upon the criteria identified, this could be extended further. For example, the analysis can also be expanded to incorporate any schools within 5km (not just the nearest); and vary the distances for example if transport will be provided.

How much does it cost?

In this option, we indicatively cost out a proposal for secondary schools of:

1. Developing guidelines and a strategy for sharing teachers across nearby schools, discussing with stakeholders, communicating this with schools and identifying applicable teachers
2. A recurring transport allowance of approximately 5% of the average monthly salary of a qualified, government payroll teacher

Action	Key activities description	Fixed or Variable	Unit Cost (Le)	Number of Units	Cost (Le Mn)
1	Develop strategy for transferring teachers within chiefdoms	One-off Fixed	15,505,545	1	16
	Consultation with stakeholders	One-off Fixed	15,505,545	1	16
	Communication of strategy	One-off Fixed, to all schools	41,650	2,432	101
	Recruitment of teachers willing to be work across schools	One-off Per teacher	100,000	186	19
2	Sharing transport allowance (Approx. 5% of salary)	Recurring Per teacher	694,402	186	129
First Year Cost (Le Mn)		Per teacher	1.5	186	280
First Year Cost (USD)		Per teacher	155	186	28,864
Recurrent Annual Cost (Le Mn)		Per teacher	0.7	186	129
Recurrent Annual Cost (USD)		Per teacher	71.6	186	13,312

Figure 5: Breakdown of costs for proposed Option B

What are the risks of this option?

Similarly with Option A, the greatest risks of this option are ensuring that the teachers do in fact work at both schools which they are being shared across and that the transport allowance is being paid to facilitate. Monitoring processes will need to be in place for this.

It is also worth noting that this policy is not explicitly targeted at sharing teachers towards remote areas, but instead ensuring a more efficient allocation. Nevertheless, it is likely and expected that this would contribute a net benefit to remote areas and schools.

What are the potential benefits of this option?

The key benefits of this option are a greater and more equitable access to specialist teachers. There is particular need for improving the teaching of English, maths and science as WASSCE pass rates in these subjects have fallen to below 5% in 2019, as explained in more detail in the Education Workforce Supply and Needs paper.

Improving the teaching of these subjects can also have a positive longer-term impact in increasing the potential pool of future teachers as passing WASSCE in maths and English (or an equivalent English exam) is required for enrolment in teacher training colleges. Moreover, improved grades in these subjects is likely to encourage more trainee teachers to specialise in these subjects, and therefore potentially form a virtuous circle of improvement.

As with Option A, there is also potential for cost-savings through this method, compared to hiring an additional teacher onto payroll to fill these subject specialisation gaps. For example, if a teacher that is currently on government payroll is shared across schools, the unit cost of 155 USD per teacher is significantly less expensive than the average salary of a teacher, or more relevantly half a teacher, as the shared teacher would only work part-time in the school currently lacking the specialist.

In other words, compared to hiring a new teacher in the disadvantaged school, redistributing a teacher from a school where they are less needed results in a cost saving of 755 USD per 'half teacher'. Across the 186 teachers suggested teachers to pilot with above, this would result in a cost saving of 144,220 USD compared to adding new teachers to payroll. Compared to the initial cost of 28,864 USD, this is equivalent to a net-saving of 115,356 USD over additional hiring.

Option C: A Preference matching model can pair schools in need with the most suitable teachers

The Recruitment and Matching paper introduces a Preference Matching Model to improve the allocations of teachers to schools, which takes into account the preferences of the teacher and the preferences of the school and uses an algorithm to identify the optimal pairings for maximising those preferences.

In terms of the particular challenge of staffing remote rural schools, these are likely not to be many teachers' highest preference, but using the Preference Matching Model we can identify the teachers that might be most suitable for those schools. For example teachers that already live relatively close, speak the same language and specialise in a subject that the school is currently lacking are most likely to be matched with the remote schools in need.

Matching preferences in this way can reduce the attrition of teachers from remote areas, reduce complaints and reduce the extent that alternative incentives might also be required.

In the Recruitment and Matching paper, an illustrative model is developed that highlights the potential of the Preference Matching Model. However, this would require further work to be implemented fully. If this option is of interest, stakeholder engagement with schools, teachers and unions can be taken further to develop the model and ensure this meets the needs of the Sierra Leone education system.

The costs of this process largely depend upon stakeholder engagement, with the actual development of the model likely to be a smaller share and, providing there is sufficient government and stakeholder support, likely able to be covered by development partners.

Option D: Provide direct incentives to those working in remote schools

Another option to encourage qualified teachers to move to and work in remote areas and schools is to provide direct incentives to those working in remote schools. Such an incentive has previously been available in Sierra Leone for teachers, is currently available for health workers, and remains a popular option.

However, the large financial cost associated with such a policy ensures that this is a significant political issue as well as a practical economic policy decision. Discussions around the feasibility of financing, as well as the levels of incentive that would be required and suitable for successful implementation are ongoing and will be taken forward in the next phase of our work.

Approach 2: Support those already in the remote areas to gain the required teaching qualifications and skills

The second approach focuses on how those that are already living and working in the remote areas and schools can be supported to gain qualifications and promote learning in these areas. This has the advantage of ensuring that these individuals are already willing to live and work in these areas and are likely to have greater ties to the area. This reduces the chance of teachers requesting to transfer away or even leaving without authorisation.

Option E: Support unqualified teachers working in schools to gain teaching qualifications and skills

Summary

- High potential unqualified and untrained teachers are supported to gain a teaching qualification by distance learning.
- The government pays for 50% of their tuition fees and provides them with a loan to cover the remaining 50%.
- The teachers receive ongoing coaching to support them to implement what they learn during in-service in the classroom.
- More detail is included in the Phase 1 Teaching and Learning Paper.

What is it and how does it combat the problem?

This option refers to supporting the unqualified teachers with the highest potential in remote areas to gain a teaching qualification by distance learning, and support them with expert coaching, whilst they continue to teach in their classrooms.

Programming decisions?

Previous Sierra Leonean programmes for supporting unqualified teachers to gain a qualification (Street Child, Teach for Sierra Leone, GATE) expected no financial contribution from the teachers they worked with. Given the relatively small scale of these programmes, this may have been feasible. However, given the larger scale programme being suggested here, this is unlikely to be feasible. Our recommendation is that the teachers receive a subsidy that covers a share of the tuition fees and then receive a loan to cover the remaining amount.

Our recommendation is for the teachers to receive a 50% subsidy and a loan to cover the remaining 50%. This way there is a clear incentive for the teachers to continue with the programme (because they are financially invested), which should help with retention. However, it also means that there is no immediate cost to gaining the qualification for the teachers. Given the likely poverty levels of many of these teachers, this is an important consideration.

Previous Sierra Leonean programmes have trialled financial support for unqualified teachers to gaining qualifications, both with and without ongoing coaching. Street Child's experience in Sierra Leone is an essential lesson. They found that supporting teachers to gain a teaching qualification had no impact on improving learning outcomes due to the poor quality of instruction in the TTCs. Only when the pursuit of the teaching qualification was coupled with regular on-site coaching were improvements in learning outcomes observed. Therefore, we recommend that any pathway that supports unqualified teachers to gain a teaching qualification should be accompanied by an element of ongoing coaching support from highly accomplished teachers.

This option is dependent on the carrying capacity of the TTCs to accommodate an increasing number of distance learners. Moreover, greater engagement with the TTCs and other key stakeholders to improve their teaching, align curriculum and increase pedagogical practice - as recommended in the Phase 2 Supply and Needs paper - will improve the effectiveness of this option.

Potential pilot?

There are a range of different characteristics of unqualified teachers. This can be used to ensure that roll out is targeted at those with the highest potential. For example, the 2018 Annual School Census data found that 7% of unqualified teachers (although only 1.6% at the primary level) had university degrees in non-teaching subjects. Whilst this alone would not be sufficient to meet the level of qualified teacher need, this would reflect a particularly high-potential group.

This could be followed by unqualified teachers that have already undertaken some extent of teacher training but that had been unable to complete the course. Finally, this could be followed by the unqualified teachers with the required WASSCE grades for TTC enrolment, but who have not yet begun a teacher training course.

In each case, this can also be focused towards those unqualified teachers that are currently working in remote areas first.

How much does it cost?

In this option, we indicatively cost out a proposal for unqualified teachers with non-teaching university degrees on government payroll of:

1. Identifying the cadre of student teachers selected for the support and ensuring their suitability
2. Paying the teacher training course costs, including subsequent recovery of half of this loan amount

3. Training of coaches that will lead the cadre of student teachers in ongoing coaching
4. Ongoing coaching of student teachers to improve teaching quality throughout qualification process

Action	Key activities description	Fixed or Variable	Unit Cost (Le)	Number of Units	Cost (Le Mn)
1	TSC selects unqualified teachers to gain a qualification	Fixed	11,604,436	1	12
	Recruitment process for unqualified teachers	Per student teacher	100,000	1,021	61
2	Payment of distance learning fee subsidies (3-year programme) - cohort 2021	Per student teacher, per year	1,716,685	1,021	5,258
	<i>Future recovery of loan amount (0.5xFee)</i>	Per student teacher	(858,342)	1,021	(2,629)
3	Development of coaching programme	Fixed	15,505,545	1	16
	Materials for coaching	Per coach	5,475	51	14
	Training of coaches	Training per coach (5 days per year)	241,759	1	37
4	Coaching visits of teachers and monitoring of trainee teachers	Per visit, per year	124,373	1,021	3,810
	Payment of phone credit for district coach	Per coach, monthly	83,300	51*12	128
	Salary of district coach	Per coach, per year	16,000,000	51	2,450
Total 4 Year Cost (Le Mn)		Per teacher	9.0	1,021	9,156
Total 4 Year Cost (USD)		Per teacher	924	1,021	943,675
Average Annual Cost (Le Mn)		Per teacher, per year	2.2	1,021	2,289
Average Annual Cost (USD)		Per teacher, per year	231	1,021	235,918

Figure 6: Breakdown of costs for proposed Option E

What are the risks of this option?

There are two main risks of this option. Firstly, that the teacher being supported is not able to pass the teacher training exams and gain the teaching qualification. However, this is likely to be minimised through the targeting of the highest potential unqualified teachers and through the provision of coaching alongside the teacher training programme.

The second risk is that the loan amount is not recovered. This risk could be minimised by also prioritising the addition of these teachers to government payroll whereby they could more easily afford, and the government recover, the loan. This would also not be unwarranted as these teachers are likely to be highly qualified and/or working in remote schools, and therefore particularly worthy of addition to payroll, depending upon the targeting that was implemented. In each case, it is important that monitoring processes are in place to avoid these issues, and that legal recourse to retrieving the loan amount is in place for those that do violate this.

Similarly, to reduce the risk of the teachers leaving the teaching profession after gaining the qualification, there could be a stipulation that the subsidy itself would also have to be repaid if this occurs within a certain minimum number of years.

It is also worth noting that this policy is not explicitly targeted at supporting teachers exclusively from remote areas, but instead is currently targeted at the unqualified teachers with the highest potential across the country. Nevertheless, it is also possible to tailor this directly towards teachers in remote schools whether by roll-out (i.e. supporting those in remote areas first) or by using different criteria (i.e. explicitly targeting those already working in remote schools).

What are the potential benefits of this option?

The key benefit of this option is to increase the number of qualified teachers in schools. The improved professionalisation through a fully-qualified workforce is a key aim of the TSC, which is targeted to be achieved by 2023. However, the associated Supply and Needs paper analyses current levels of enrolment in teacher training colleges compared to the need, and finds that this will not be achieved in time, without interventions such as this to support and incentivise enrolment.

Increasing the number of qualified teachers is intended to increase student learning and whilst there are quality issues with the pre-service training system, the Phase 1 Report does find correlations between the numbers of qualified teachers in schools and the learning outcomes of those pupils. Moreover, the additional coaching provided in this option during the qualification process also serves to improve teaching quality and student learning throughout.

Option F: Support young women living in remote areas to gain teaching qualifications and skills

Summary

- The GATE project in Sierra Leone has worked with young women from remote rural areas to support them to train and qualify as primary school teachers.
- As these are areas that struggle to attract qualified teachers, and as Sierra Leone has the 6th lowest share of female teachers in the world, championing and scaling up this programme can provide a range of benefits.
- The process is made up of a *learning assistant* phase, where the young women gain classroom experience and prepare for the Teacher Training College entrance exams, followed by a *student teachers* phase where they continue their school placements whilst studying for the teaching qualifications via distance learning. Coaching is provided throughout both phases to improve their classroom efficacy whilst studying.

What is it and how does it combat the problem?

The GATE program works with marginalised young women living in rural areas, who aspire to become primary school teachers and role models for girls in their classrooms. Supporting these young women to gain teaching qualifications can achieve the dual targets of a qualified and effective teacher workforce in remote schools, and increasing the number of female teachers from the very low levels found currently.

The GATE program has had a very high success rate in passing both the teacher training entrance exams, and the teacher training courses themselves. More generally, the Supply and Needs paper finds that the pass rate of teacher training course exams is the same for both conventional and distance learners, suggesting that there is no drop off in teacher quality through this pathway.

Programming decisions?

Whilst the GATE project has focused on young women, and this does address a specific inequity in the Sierra Leone teaching workforce, this model could be applied across genders.

As highlighted above in Option E, it is recommended that coaching is provided as well as financial support. Previous experience has found that supporting teachers to gain a teaching qualification had no impact on improving learning outcomes due to the poor quality of instruction in the TTCs. Only when the pursuit of the teaching qualification was coupled with regular on-site coaching were improvements in learning outcomes observed.

Potential pilot?

The GATE project has already supported more than 500 young women across five districts to gain teaching qualifications whilst working in remote, rural schools. The high success rate in completing the teacher training suggests that this is ready to be scaled-up further.

Those that have already qualified could also be considered for prioritisation in adding to government payroll as they meet priority criteria of being female teachers, already working in remote schools, and having received expert coaching to improve their pedagogical methods.

How much does it cost?

Using real cost data shared by the GATE project team, we can show the exact costs for the initial 500 young women across five districts with 60 tutors, and project this to a national scale up of 1,500 young women across all 16 districts with 180 tutors.

The key steps involve:

1. Student teachers given induction, revision camps, learning materials, bursaries, tuition fees and exam fees
2. Tutors to support the student teachers during the learning assistant phase, and Practice Study Mentors (PSMs) to support during the student teacher phase, provided with training and stipends

3. District-level costs for recruitment of student teachers, training and revision facility hire, and community engagement
4. Fixed costs of developing materials and digital design that are gender-sensitive

Action	Key activities description	Fixed or Variable	Unit Cost (Le)	Number of Units	Cost (Le Mn)
1	Student teacher induction, learning materials and revision camps including food and transport	Per student teacher	16,881,401	1,500	25,322
	Student teacher bursaries	Per student teacher	704,539	1,500	1,057
	Student teacher tuition fees and exam fees	Per student teacher	6,719,648	1,500	10,079
2	Tutor training and stipends	Per tutor, 1 year	6,852,031	180	1,233
	PSM training and stipends	Per PSM, 3 years	12,588,750	180	2,266
3	District-level recruitment	Per district	36,490,576	16	584
	District facility hire	Per district	16,810,455	16	269
	Community engagement	Per district	75,071,908	16	1,201
4	Fixed costs of developing materials and digital design	Fixed	1,895,843,128	1	1,896
Total 4 Year Cost (Le Mn)		Per teacher	29.3	1,500	43,908
Total 4 Year Cost (USD)		Per teacher	3,017	1,500	4,525,253
Average Annual Cost (Le Mn)		Per teacher	7.3	1,500	10,977
Average Annual Cost (USD)		Per teacher	754	1,500	1,131,313

Figure 7: Breakdown of costs for proposed Option F

What are the risks of this option?

As with Option E, there is a risk that the teacher being supported is not able to pass the teacher training entrance exams or final exams and gain the teaching qualification. However, this risk is likely to be reduced by the provision of coaching and revision camps, and the experience so far has been of a very high success rate, above that of regular TTC entrants.

Similarly, the risk of the teachers leaving the teaching profession after gaining the qualification can also be reduced by a stipulation that some extent of the fees or stipends would have to be repaid if this occurs within a certain minimum number of years.

What are the potential benefits of this option?

This option has a number of key benefits. Firstly, it directly combats the challenge of increasing the number of qualified teachers in remote schools as it is currently only implemented in such remote schools. The coaching and support provided also ensures not only a high success rate in the teachers qualifying, but also improves the teaching quality and student learning throughout the learning assistant and student teacher process.

Hiring and training directly from the remote areas themselves also increase the likelihood of the teachers staying in those areas longer term. As well as reducing attrition out of these

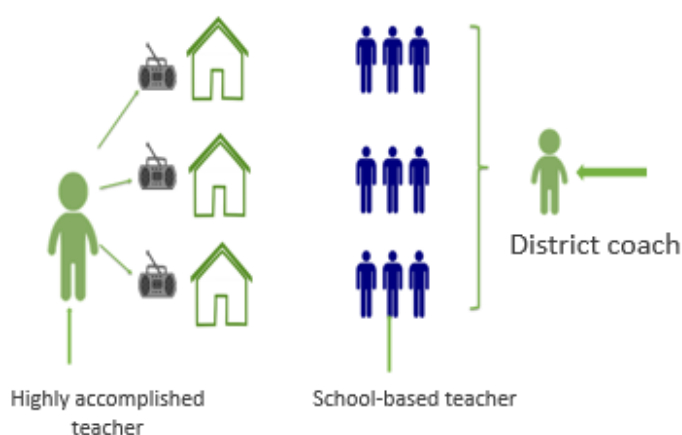
areas, this also reduces the need for remote, housing or relocation incentives. This is an important consideration due to the financial constraints the system is operating under.

Another key benefit is the focus on increasing the number of female teachers. As raised in the associated Supply and Needs paper, Sierra Leone has the 6th lowest share of female teachers in the world. Moreover, the Spatial Analysis paper finds that this is particularly prevalent in remote schools, with the share of female teachers falling by half in schools that are more than 5km from an urban centre. Addressing this shortfall can increase equality, provide gender role models for female students, and potentially improve female students' achievement. A recent evaluation of the GATE program also found a number of societal benefits for the participants and their communities through this process.

Option G: Improving learning using expert radio lessons can increase the pool of potential future teachers in remote areas

Summary

- Distinguished teachers record high-quality audio lessons focused on foundational skills in numeracy and literacy.
- Recorded audio lessons are distributed by SD card to teachers in remote schools. The teachers themselves act as facilitators during the lessons.
- The teachers receive ongoing coaching, both on-site and virtually, to monitor usage of the resource and help them use resources effectively.



What is it and how does it combat the problem?

Whilst there is a lack of qualified and effective teachers in remote areas, learning interventions can have dual benefits of mitigating these disadvantages in the short-term,

and potentially increasing the pool of potential teachers in the long-term by improving the learning and examination results of children in those areas.

One intervention that has international evidence of success, as well as previous experience in Sierra Leone during the Ebola crisis, and is particularly relevant during the ongoing Covid-19 pandemic is using radios to deliver high-quality lessons into remote classrooms and using the teachers in those classrooms to facilitate the learning.

Programming decisions?

A key lesson from the Leh Wi Learn programme in Sierra Leone, and from other programmes internationally, is that provision of high-quality lesson resources – whether they are lesson plans or lesson recordings – needs to be coupled with a monitoring and coaching function to maximise impact.

Potential pilot?

The large numbers of radio lesson resources already recorded (a legacy from the Ebola crisis, from the Radio Education broadcastings and the current Covid-19 response), could reduce the up-front costs required to develop new materials.

To take this further, 3-5 highly accomplished teachers will probably need to spend three months adapting and developing the existing bank of radio lessons, ensuring that they focus on key foundational skills. They will also design the accompanying written exercises to go with the lessons. Many of the lessons may need to be re-recorded to incorporate the changes.

Once the lessons have been prepared, the district-level coaches will be trained in the teaching approach. The lesson developers will conduct a five-day training in which time the coaches will observe the lessons being delivered, and learn ways to maximise their impact.

Once the coaches have been trained, they will need to train the local teachers, or facilitators, in the approach. Each school will send one teacher to the training. This will be an intensive one-day training session that takes place in the Chiefdom. The training will explain the justification for the lessons, allow the teachers to observe a radio lesson and discuss their responsibilities when the lessons are playing. We expect a coach to teacher ratio of 1:40, considering that coaching will be a blend of on-site and virtual. Peer learning communities could be established by the coach, for example using WhatsApp groups, so that teachers could provide each other mutual support as well, as has been successful in other contexts.

Each school in the pilot will have one teacher who has been trained in the approach. This one teacher will then be responsible for delivery of recorded audio lessons within that school. They will play the audio lessons on-demand from the SD card that they have been provided with. They will also be able to be sent accompanying written exercises by phone, which can then be written on the board. Each teacher in the pilot will be visited by the coach within the first month of the pilot. Coaches will visit every 2-3 months thereafter, and will be in contact with teachers weekly by phone.

How much does it cost?

In this option, we indicatively cost out a proposal for 100 pilot primary schools, each with six grades, for a total of 600 school grades with 15 highly accomplished teacher coaches of:

1. Using highly accomplished teachers to plan and record the lessons (the need for this may be reduced due to the recent bank of lessons developed during the Covid crisis)
2. Purchasing and distributing the SD cards with the lessons on, and radios for an estimated half of schools that will be currently without radios with SD card slots
3. Training of coaches that will instruct the teachers in remote schools to use the technology and facilitate the recorded audio lessons
4. Ongoing coaching to the teachers in remote schools to improve use and learning

Action	Key activities description	Fixed or Variable	Unit Cost (Le)	Number of Units	Cost (Le Mn)
1	Highly accomplished teachers recording lessons	Per teacher, annual	5,000,000	4	20
2	SD Card costs	Per school grade, annual	1,000,000	600	600
	Radio costs	Per 50% of school grades, one-off	275,000	300	83
3	Development of coaching course	Fixed, one-off	15,505,545	1	16
	Training of coaches	Per coach, annual	422,142	15	6
4	Coaching visit costs	Per visit (5 per school grade), annual	124,373	15	373
	Payment of phone credit for coach	Per coach, monthly	83,300	15*12	15
	Salary of coach	Per coach, annual	20,000,000	15	300
First Year Cost (Le Mn)		Per class	2.4	600	1,412
First Year Cost (USD)		Per class	243	600	145,563
Recurrent Annual Cost (Le Mn)		Per class	2.2	600	1,314
Recurrent Annual Cost (USD)		Per class	226	600	135,462

Figure 8: Breakdown of costs for proposed Option G

Assuming a class size of 40, this works out at 24,000 children reached by this option, at a unit cost of approximately Le 54,765 per child or USD 5.64 per child.

The costs of this option may be reduced as a result of the Covid-19 crisis which has increased the bank of recorded expert lessons, as well as increasing the number of radios already provided within schools.

What are the risks of this option?

The greatest risk of this option is that the take up or implementation of the recorded audio lessons is poor. This risk is reduced by the ongoing coaching, and is also reduced by the practical experience already within Sierra Leone from the Ebola crisis and current Covid-19

closures. Similarly, the risk of equipment malfunction or a lack of power connectivity is reduced by the practical experience, which has encouraged the provision of robust, solar-powered radios.

What are the potential benefits of this option?

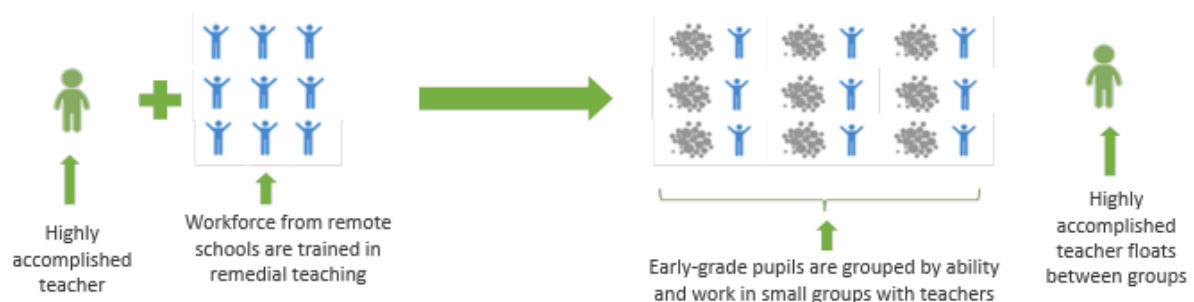
The key benefit of this option is ensuring the quality of lessons being provided in schools. This is particularly useful in remote schools where the number of qualified teachers is low, and the ability to easily monitor classes is reduced. As these are also areas where student learning and exam results are lowest, ensuring high quality lessons are being provided can help to mitigate these differences in the short-term.

Moreover, the Ebola and Covid-19 crises have highlighted the importance in radio lessons for building resilience within the education system. Improving the use, quality and practice of students learning from such lessons can also benefit the system in the longer-term.

Option H: Improving learning using study camps can increase the pool of potential future teachers

Summary

- Expert remedial instructors lead in-school learning camps during term time, supported by teams of unqualified and untrained teachers.
- Each school in pilot receives 2x 20-day learning camps, focused on foundational skills in numeracy and literacy.



What is it and how does it combat the problem?

As with Option G, interventions focused on student learning can have dual benefits of mitigating the disadvantages of students in remote schools in the short-term, and potentially increasing the pool of potential teachers in the long-term by improving the learning and examination results of children in those areas.

This option builds on the significant international literature on Teaching at the Right Level (TaRL) and recommends for schools to participate in intensive learning camps (with a clear

focus on foundational numeracy and literacy), led by expert remedial instructors supported by the local teachers.

As children in poorer, remote areas are likely to be the most disadvantaged by the current school closures during the Covid-19 crisis, this method could also be a useful 'equaliser' when restarting schools, and ensure these children aren't left further behind.

Programming decisions?

A key programmatic decision for these learning camps is whether to run these camps during regular term time or not. Our recommendation is that this would take place in schools, during term time to maximise student attendance, during which the schools would go entirely 'off-timetable'. Whilst it is somewhat undesirable to disrupt regular teaching in this way, there is ample evidence that after-school camps would be relatively poorly attended compared to in-school camps, and that the 'net effect' on learning is greatest during school time.

Potential pilot?

Within a selected district, a pilot with approximately 100 schools would be beneficial initially to facilitate an evaluation. This could be targeted at the lowest performing schools.

The first stage will involve training the expert remedial instructors. This is likely to take 2-3 weeks, and will be delivered by individuals and organisations experienced with the approach (for example, by TaRL trainers). For the pilot phase (running for 2-3 years), we anticipate training 8-10 instructors.

The second stage will involve the instructors training the local teachers. We expect this to take place on the day before the first day of the learning camp (likely on a weekend day). The instructor will model the approach and distribute any relevant teaching materials. At the beginning of each day of the camp, the instructor will lead a short briefing that will detail the activities and objectives for that day, and model any key techniques. At the end of each day, there will also be a short debrief session in which the instructor will share their observations and reflections of the unqualified and untrained teacher's practice from that day.

Each school will receive 2x20-day learning camps over the pilot period. Given 100 schools in the pilot, this means that 200 camps will be held over the period. Each instructor will be expected to lead approximately 8-9 camps per year (assuming there are ~180 school days yearly). The instructors will be paid a yearly salary of approximately \$2,250 (in the bracket of a Senior Teacher). There is no cost to utilising the local teachers, as they would be in school during the learning camp period anyway.

How much does it cost?

In this option, we indicatively cost out a proposal for 2 'trainer of trainers' to instruct 9 highly accomplished teachers to provide 9 camps each per year, or 81 camps in total, of:

1. 'Trainer of trainer' costs for instructing highly accomplished teachers in specialised remedial teaching
2. Highly accomplished teacher costs for salaries and transport to remote schools

3. Training materials for the teachers in remote schools

Action	Key activities description	Fixed or Variable	Unit Cost (Le)	Number of Units	Cost (Le Mn)
1	Development of coaching programme	Fixed, one-off	15,505,545	1	16
	'Trainer of trainer' costs	Per 'ToT', annual	153,846	2	0.3
2	Highly accomplished teachers' salaries	Per teacher, annual	20,000,000	9	180
	Transport costs for highly accomplished teachers	Per camp	124,373	81	10
3	Training materials for teachers in remote schools	Six local teachers per camp, annual	5,475	486	3
First Year Cost (Le Mn)		Per camp	2.6	81	209
First Year Cost (USD)		Per camp	265	81	21,503
Recurrent Annual Cost (Le Mn)		Per camp	2.4	81	193
Recurrent Annual Cost (USD)		Per camp	246	81	19,905

Figure 9: Breakdown of costs for proposed Option H

Assuming a class size of 40, this works out at 18,360 children reached by this option per year, at a unit cost of approximately Le 10,519 per child or USD 1.08 per child.

What are the risks of this option?

The greatest risks of this option are that the study camps do not contribute to an increase in learning as intended, and instead are less beneficial than the regular class time that is interrupted. However, the risks of this are low based on the use of highly accomplished teachers, further trained in remedial education techniques, and based on an extensive international literature of successful implementation including in other contexts from within the region.

What are the potential benefits of this option?

The key benefit of this option is the improved learning of foundational skills resulting from the focus on remedial education, and the implementation of the strongly evidenced Teaching at the Right Level (TaRL) methods. Incorporating the use of this into the system has benefits not only for the students and teachers involved but also for the wider system through the recognition of such benefits and methods.

As well as the benefits of the remedial focus to equity and ensuring that all students learn the key foundational skills, the targeted implementation of these learning camps can further improve equity within the system. For example, after the resumption of schooling following the Covid-19 crisis, learning camps could help to bolster learning in areas that have been worse affected such as the remote areas where access to the radio lessons programme has been lower (due to both lower radio ownership and poorer connectivity), and where distances to schools make it harder for teachers to have kept track and facilitated learning during the school closures.