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Advice on Narrowing the Learning Gaps between Schools

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Executive Summary

The Equitable Education Fund (EEF) approached the World Bank for technical and advisory services to support them to design a project to narrow the performance gaps between schools in selected provinces/areas in Thailand. This final report contains the deliverables under the reimbursable advisory agreement that was signed between the World Bank and EEF. The EEF expects to use this advice to develop a small-scale program to pilot an approach or approaches to narrow the performance gaps, in collaboration with the Office of the Basic Education Commission (OBEC). If this proves successful, the step after that would be for OBEC to design, fund and implement a much larger program to address the large number of small schools. EEF's (and OBEC's) intention is to improve the quality of "Protected" primary schools and small primary "Hub" schools which are strategically located so that they are able to accommodate students from other nearby small, poor quality "Affiliated" schools, which will be closed down. It is expected that the lessons learnt from the pilot will provide policymakers with valuable evidence, making future nationwide expansion of the program more likely to be successful.

Current Situation Analysis

As many as 16,657 out of 29,466 schools (or 57 percent of schools) under OBEC's supervision are considered small[1] and 1.26 million students (or 19 percent of all students) are enrolled in these schools. The average enrolment size for the 16,657 small schools is just 75 and the bulk of these schools are "Primary" and "Opportunity expansion" schools.[2]

Even though the small schools have very low pupil-teacher ratios, they have a very large number of tiny classes and there are not enough teachers to teach in them. Classes in these schools are half empty, especially in the primary grades, where the average class has less than 9 students. Even though the pupil-teacher ratio for these schools is as low as 9.5:1, the schools are chronically understaffed (defined as having an average teacher-to-class ratio of less than one), with teacher-to-class ratio of just 0.94. Teachers and other educational resources are being spread too thinly across too many small classes. The small average class size and low pupil-teacher ratio in Thai schools, therefore, do not result in a high quality learning environment. Instead, the existence of too many half empty classrooms in this oversized school network actually means a huge misallocation of educational resources and great spending inefficiency.

If the current school network remains as it is, Thailand would need to recruit, train, and deploy nearly 76,000 additional teachers in order to adequately staff all classes in Thai schools. The Teacher Demand Model (see Annex 2.1 in Chapter 2) suggests that the total number of teachers required to staff all existing classes adequately is 542,851. However, there are 467,115 educational personnel (principals, deputy principals, and teachers) in OBEC schools currently. If no action is taken

[1] In this report, a school is defined as "Small" if it has less than 20 students per grade on average.

[2] A "Primary" school is defined as a school which has grade levels up to G6; An "Opportunity expansion" school is a school which has primary and lower secondary grades (up to G9); A "Secondary" school is a school which has only secondary grades (G7-G12); and A "Complete" school is a school which has all primary and secondary grades (G1-G12).

to reorganize the vast school network, then it would be necessary to recruit, train, and deploy almost 76,000 additional teachers to eliminate the teacher shortage across all 337,513 existing classrooms.[3]

Teacher shortages are much more acute among the small schools serving socio-economically disadvantaged students. It is estimated that a massive increase of 52 percent in the teaching force is needed in the small schools. Adequately staffing all classes in these schools under the current situation would thus require lowering their (already very low) pupil-teacher ratio further, which would in turn lead to a sharp increase in their per-student cost. The concentration of socio-economically disadvantaged students is found to be much greater in these "Disadvantaged" small schools.[4]

Furthermore, teachers and school principals in these schools are much less qualified, both in terms of educational qualifications and academic ranking. Not only are the "Disadvantaged" schools inadequately staffed, all of the personnel quality indicators are also much worse than those for the "Advantaged" group. The observed resource allocation inequality and the over-representation of poor students in the Disadvantaged schools, if left unattended, will likely continue to perpetuate social and economic inequality in the country.

Empirical evidence established in this report, as well as from recent World Bank reports, suggest that there is considerable scope for improving Thai students' learning outcomes and reducing achievement disparities. However, achieving these goals requires that Thailand urgently embarks on addressing the challenges of chronic teacher and other educational resource misallocations. Tackling this problem in a cost-efficient manner should be at the center of Thailand's reform initiatives if the country is to successfully raise the standard of education provision and reduce student outcome inequality. There is added urgency given the impact of the current COVID-19 pandemic.

Optimizing Educational Resource Allocation through School Network Re-organization

A school network reorganization software developed under this project is described in Chapter 3. The software is a tool for policymakers to systematically classify schools into 5 school-type categories: i) Hub schools; ii) Affiliated schools; iii) Protected schools; iv) Isolated schools; and v) Large schools.[5] Options for the criteria to be used to determine the 5 school types are provided in the software. These options serve as the policy variables for policymakers and are discussed in detail in the chapter. The software will suggest which of the Affiliated schools could be merged with which of the identified

[3] If principals and deputy principals are not allowed to teach, then the number of additional personnel required to staff all schools adequately would be even higher than 76,000.

[4] Chapter 2, Section 2.2 classifies schools into 4 distinct groups based on multiple measures of observable school characteristics and inputs which have been empirically shown to be important for student learning in Thailand. In particular, the labels "Advantaged", "Above average", "Average", and "Disadvantaged" are assigned to the four groups of schools based on the measured "quality" of their key inputs. Virtually the entirety of schools defined as "Small" are classified as Disadvantaged schools.

[5] ***Hub schools:*** Enrolment size of less than 500 (prior to consolidation), located within a cluster, has a football pitch or a children playground, and selected as "Hub" by the School Network Consolidation Algorithm (see Box 3.1)
Affiliated schools: Enrolment size of less than 500, located within a cluster, and NOT selected as "Hub" by the algorithm
Protected schools: Small and Isolated (located more than 6 km from any other school)
Isolated schools: Non-small and isolated
Large schools: Enrolment size of more than or equal to 500 students

Hub schools so that the aggregate travel distance for the students is minimized. Detailed results from one reorganization option is discussed in this report. Notice that if a different set of policy variables are chosen, then the resulting number of schools in each school type category, the school size distribution after the proposed school consolidation, the number of teachers required, and the travel distance for the students will be different.

The reorganization model illustrated in this report suggests that as many as 17,120 Affiliated schools could be merged with 6,821 Hub schools (using the baseline parameters), leaving a total of 12,346 schools remaining after the consolidation. At present, around 3.05 million students (out of a total student population of 6.61 million) are enrolled in the 23,941 Hub and Affiliated schools. Class sizes in these schools are very small, especially for the Affiliated schools where primary level classes average less than 13 students. These schools are also understaffed (teacher-to-class ratios of 1.29 and 1.08 for Hub and Affiliated schools respectively) and the teacher demand model suggests that a total of 330,669 teachers are required to adequately staff all classes in these schools, a 31 percent increase from the current teaching force. At the aggregate level, as many as 542,851 teachers are needed to adequately staff all classes in Thai schools, a 16.2 percent increase over the current total teaching force of 467,115. However, the model suggests that as many as 17,120 Affiliated schools could be consolidated into the 6,821 Hub schools without impairing student access. The total number of schools nationwide would decline from 29,466 to 12,346 after the reorganization.

The reorganization would affect millions of students and teachers. With an estimated 58 percent of the current schools to be closed, more than 3 million students would be affected (those students in the Hub and the Affiliated schools) and the majority of them would be expected to attend school in a different location. Geographically, the provinces of Nakhon Ratchasima, Ubon Ratchathani, Buri Ram, Surin, and Si Sa Ket would be more affected than others in terms of number of students affected. These 5 provinces are all in the Northeastern region of Thailand and they account for 20.1 percent of the total affected students. In terms of share of students in the province affected, Pattani (South) and Si Sa Ket would come out on top, each with an estimated 91 percent of their children affected. According to this measure, the three conflict-affected southernmost provinces of Thailand would all be greatly affected, with an estimated 91 percent of students in Pattani, 85 percent in Narathiwat, and 81 percent in Yala affected by the reorganization. Furthermore, socio-economically, the poorest students would be the most affected. Importantly, though, we find that despite the large number of school closures, the average travel distance which the poor and the very poor travel would remain virtually unchanged – increasing by only 22 and 35 meters on average respectively.

The school network reorganization would reduce the total number of classes in OBEC schools from 337,513 to 262,094, allowing all classes to be adequately staffed. More importantly, the current teaching force of 467,115 is more than adequate as the teacher demand model indicates that 417,460 teachers are needed to staff the 262,094 classes consisting of 6.61 million students. Even with this reduced number of teachers, the average teacher-to-class ratio would increase from 1.38 to 1.59 while the average primary level class size would increase from 16.7 to 24.6 students. Some of the surplus teachers from "Merged schools" could be reassigned to the "Protected schools," which are chronically understaffed. The economies of scale resulting from the merger and the appropriate redistribution of existing teachers could therefore eliminate the aggregate teacher shortage in the Thai basic education system.

The upgrading of school physical environment could also be carried out much more cost effectively with the smaller number of larger schools remaining after the reorganization. The school network reorganization reform considered in this study, therefore, has the potential to tremendously enhance Thailand's education spending efficiency and quality of education provided.

Due to the natural retirement rates of teachers and school principals, Thailand can gradually consolidate its school network without having to lay off a single teacher in the process. The current age profile of teachers means that it is expected that 80,061 teachers will retire over the next five years, leaving 387,054 teachers. Of course, it is important to be able to continue to recruit new teachers into the profession and on this model 30,402 new teachers could be recruited. It should also be recognized that the reorganization of schools implies that many teachers would have to change their place of work and this might have legal, practical and financial implications. These issues will be discussed in more detail in the report.

Even with the much smaller number of schools emerging from the model, the average travel distance for students is estimated to decline. The average travel distance for the 4.49 million students enrolled in OBEC schools (excluding students in Secondary schools, which are not part of the reorganization plan) would decline from 5.50 km to 5.36 km (2.6 percent reduction) after the reorganization, assuming all students attend the school l closest to home. Of the 4.49 million students, 1,228,836 students would travel less than before (27.3 percent); 2,268,297 would travel the same distance (50.5 percent); and 996,687 would have to travel to school further than before (22.2 percent).

Per-Student Financing Conceptual Framework

Chapter 4 touches on two structural problems in the way Thailand's network is managed: education personnel allocation criteria which result in educational inequality; and a funding model which provides incentives for local actors to focus on inputs, not outputs.

The current Teacher Civil Service and Educational Personnel Commission (TEPC) personnel allocation rules have the effect that the vast majority of small schools with less than 120 enrolled students (Type 1 and Type 3 schools[6]) have far too few teachers to deliver quality education. The TEPC personnel allocation rules are not driven by other regulations in the education sector: the curriculum that needs teaching (i.e. how many hours of Thai language needs teaching); the number of teaching hours each teacher can teach; and teachers' professional background (i.e. teacher trained to teach physics for 8th graders may be able to teach math for 4th graders, but not English for 9th graders). The rules have the effect of "rationing" the number of teachers in the system by limiting the number of teachers in small schools. Nearly 1 million students are currently attending these chronically understaffed schools and they are much more likely to come from lower socioeconomic

[6] Type 1: Schools with 120 or less enrolled students, which have Preschool-Primary 6 or Primary 1-Primary 6 grades
Type 2: Schools with more than 120 enrolled students, which have Preschool-Primary 6 or Primary 1-Primary 6 grades
Type 3: Schools with 120 or less enrolled students, which have Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades
Type 4: Schools with more than 120 enrolled students, with Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades
Type 5: Secondary schools with only secondary grades

status families. Students in small schools are thus systemically disadvantaged by the TEPC's teacher allocation rules. The chapter concludes that the current personnel allocation rules used by TEPC are at the heart of the equity problem.

The Teacher Demand Model discussed in Chapter 2 is proposed as an alternative approach to the allocation of teachers. This allocation formula, represented by "WB-TDM," suggests that teaching staff allocation for the 13,805 Type 1 schools should be almost 3 times larger than the allocation suggested by the TEPC formula, and that the 859 Type 3 schools should be allocated almost twice the TEPC allocation. On the other hand, for the larger Types 2, 4, and 5 schools,[7] the average numbers of teaching staff required per school computed using the TEPC formulae and the teacher demand model are not very different.

Tackling this educational resource allocation problem and distributing educational resources more adequately and equitably would improve both the quality and equity of the system. The economies of scale resulting from the merger and the appropriate redistribution of existing teachers were found to eliminate the aggregate teacher shortage (see Chapter 3). The illustrated school network reorganization, if carried out fully, would reduce the total number of schools nationwide from 29,466 to 12,346 all of which could be adequately staffed. The reorganization of the school network is therefore a necessary prerequisite to implementing the alternative personnel allocation formula, as it would be totally unrealistic to expect the Ministry of Education to be willing or be able to expand the educational workforce by as much as 24 percent as required to adequately staff all classrooms in the current approach.

Another challenge with the allocation of educational personnel based on headcount alone is that higher-qualified and experienced (and hence more expensive) teachers and school managers are seen to gravitate towards larger urban schools. The existing centralized teacher deployment process allows teachers to be redeployed to any location of their own choosing once they have been in service for over two years (provided there is an available teaching position). Furthermore, the system does not provide any incentive to educational personnel to work in schools in remote areas. A more equitable distribution of personnel qualification across schools can be achieved if either a greater share of the higher-qualified and experienced personnel can simply be assigned to rural schools, or if a system can be designed to provide the right incentives for such moves.

There are several problems with the way the system is currently financed. The main one being the centrally funded teacher salary, where schools have very little flexibility in managing this key input. Teachers are simply allocated based on the TEPC formula as explained above. With a much smaller number of schools, Thailand may want to re-think its school financing system in the longer term. An important element in such reforms would be to shift from financing inputs based on poorly designed central resource allocation rules to financing outputs or even results using a transparent, efficient, and equitable funding formula, which adequately reflects the different per-student costs associated with providing different types of education in different schooling environments to students with diverse needs.

[7] There are 14,802 Type 2, 4, and 5 schools whose students total 5.64 million (almost 6 times the total number of students in the 14,664 Type 1 and Type 3 schools).

A basic per-student funding formula, which properly takes into consideration the number of personnel required in each school, while applying the same national average wage rates for teachers and school managers across all schools is recommended as a more efficient and equitable option in the long-run. A well-designed per-student funding formula for current expenditure, including personnel salary, has the potential to incentivize school administrators to manage key resources, especially teachers, more efficiently. As mentioned previously, in Thailand's highly centralized public school personnel management system, the salaries of educational personnel are paid directly by the central government and not through the school account. From a school's perspective, these personnel are free resources and schools have little flexibility in managing this key input. The use of a basic per-student funding formula, which properly takes into consideration the number of personnel required in each school, while applying the same national average wage rates for teachers and school managers across all schools is likely going to be a more efficient and equitable option.

If the education budget remains fixed, distributing funding differently will inevitably mean there are some schools which receive less money as others receive more. In general, this means large urban schools with much greater concentration of experienced and high-ranking personnel as their salaries are much higher than those of the personnel likely found in small remote schools. From a public policy perspective, all schools, regardless of the socioeconomic background of the student body, should be allocated adequate number of personnel with comparable composition of qualification and experience. This more equitable allocation can be achieved if the personnel salary allocations for all schools are calculated based on the adequate number of personnel (determined using the proposed teacher demand model) and the national average wage rates for teachers and school managers. Even though large urban schools will necessarily see their funding reduced by this approach, they are in a much better position than the small rural schools to raise additional resources from wealthier parents in order to maintain their above average personnel quality composition. The rural schools, on the other hand, will be endowed with more resources to attract higher-quality personnel, thus enhancing equity.

Moreover, a Special Hardship Allowance could be explored as a viable instrument for providing stronger incentives to attract quality teachers to small remote schools. At the moment, the same standard salary scales are applied across all geographical areas of the country, regardless of specific characteristics of the areas such as transport inaccessibility or lack of basic infrastructure. This report recommends an introduction of a "Special Hardship Allowance" (SHA) for educational personnel assigned to a hardship post. A design of a School Hardship Index, to measure the hardship faced by personnel in schools located in difficult environments, is illustrated in the chapter. This index would be used to determine the level of SHA associated with a posting location, with an objective to incentivize more highly qualified and experienced educational personnel to work in hardship areas and thus further promote equity.

The current underprivileged student subsidy is not as equitable as it should be due to the current budget rationing practice. Without the rationing, the total underprivileged subsidy would have amounted to THB 2.47 billion.[8] However, due to inadequate budget, a ceiling has been

[8] The annual per-student subsidies amount to THB 1,000 and THB 3,000 each for poor primary and lower secondary students respectively.

established so that each school can only receive the per-student subsidy for a maximum of 40 and 30 percent of the total primary and lower secondary students enrolled in the school respectively. As a result, the underprivileged subsidy was rationed in 2019 for as many as 60.5 percent of schools with primary grades and 69.3 percent of schools with lower secondary grades . However, the poor students are mostly concentrated in the small Disadvantaged schools and in these schools there are usually more than 40 or 30 underprivileged primary or lower secondary students. The rationing process, therefore, means that only THB 1.38 billion instead of THB 2.47 billion (or 56 percent) was allocated to schools. The analysis, therefore, shows that the underprivileged subsidy rationing process has once again put small schools with high concentration of poor students at a distinct disadvantage.

The chapter then proceeds to explore and cost out the option of introducing transportation grants to incentivize students and their parents to support the proposed school network reorganization plan. Finally, simulations of total spending are made based on the planned school network reorganization scenario using the proposed per-student funding formula for recurrent expenditure. The results are compared to the actual allocations incurred in 2019 to reveal the potential gain in spending efficiency of more than THB 12 billion per annum. The saving would be more than sufficient to allow OBEC to fully fund the per head subsidy for all underprivileged students, the proposed transportation grants, and the boarding subsidy for students with schooling access difficulty (those who would live more than 50 km from their nearest schools after the reorganization).

Thailand Fundamental School Quality Standards

The most important reason for proposing the re-organization of the school network is that students attending Thailand's smaller schools are clearly being poorly served. Their schools struggle with lasting teacher shortages, and they have poorer infrastructure and poorer supplies of materials.

This report recommends introducing a set of fundamental school quality standards (FSQLs) for two main reasons: first, by having a set of "minimum standards" for all schools, the current underinvestment in smaller schools will become more visible. Second, it is hoped that the standards can become a visible and tangible part of the promise that policymakers can make to communities when seeking to convince them to close down their schools. That is, the promise would be: look how inadequate your current school is vis-à-vis these standards. The new school – less than 6 km down the road – meets all of these standards.

The set of fundamental school quality standards (FSQLs) for Thailand, described in Chapter 5, is based on international experience, country norms on school availability and school infrastructure and facilities, findings from previous empirical research for Thailand, and operational areas that are commonly found among minimum standards requirements of several countries. The chapter includes examples of FSQLs from a set of countries that have taken the approach of developing and implementing minimum school quality standards to achieve higher quality education delivery in schools and better learning outcomes. Country examples used in the report include Serbia, Moldova, Vietnam and Malaysia.

Operational areas included in the set of FSQLs for Thailand include: (i) school management focusing on good leadership at the school level for effective decision-making, management of school

personnel, use of resources, and evidence-based improvement in school quality, (ii) school autonomy and accountability for empowering school leaders and managers, teachers and the community to improve student learning and other outcomes, (iii) equity which can be achieved through the implementation of a common set of minimum standards across schools located in a variety of geographical settings and catering to students belonging to more or less advantaged socio-economic groups, (iv) teacher quality and effectiveness focusing on teacher education and professional development and teaching-learning practices in the classrooms, (v) school infrastructure and facilities taking cognizance of existing country norms and international good practices, (vi) effective and efficient utilization of resources guided by the FSQLs and evidence, and (vii) community engagement to create ownership and partnerships that can provide additional physical and financial resources to schools. The chapter provides a comprehensive set of FSQLs for Thailand in each of the operational areas, along with the scores to be assigned to schools with respect to each standard and description of the achievement range (from low to high or Yes/No) of each standard that will determine the score for that standard for that school.

Before FSQLs can be effectively operationalized, several questions need to be considered and prior steps taken by the Government of Thailand. Questions that need to be considered include the time, effort and cost of monitoring achievement, the fiscal implications of filling the gaps between the current status of schools and the FSQLs, changes in resource allocation at the national, sub-national and school levels to achieve the FSQLs, and the use of data collected through the FSQL exercise for accountability and informing the public. For operationalizing the FSQLs, the Government of Thailand will need to carry out (a) a pilot exercise wherein the FSQLs are used to collect information from a representative set of schools and (b) develop an operational manual. The pilot will help in identifying standards to be included and excluded, fine tuning the description of the standards, the range of responses, how standards are understood, and measurement steps that will need to be taken, once the standards have been officially endorsed and adopted. The findings from the pilot will also inform the development of a comprehensive but user-friendly operational manual that will need to be made available to all stakeholders for implementing and monitoring the FSQLs. The chapter includes illustrative examples of standards for the operational manual.

Developing and Implementing Environment and Social Risks and Impact Mitigation Measures for Re-organization of School Networks

The options/instruments/recommendations to support students, parents, school personnel, and communities affected by the reorganization of the school network are discussed in Chapter 6. These include, inter alia, (i) strategic communication for stakeholder consultations; (ii) guidance on the analysis of relevant environmental and social issues and risks, as well as recommendations on how to address identified risks; and (iii) guidance on establishing a grievance redress mechanism. The chapter also provides a preliminary environmental and social risk screening and mitigation roadmap .

Evaluating the Impacts of the School Upgrading Intervention

A guidance-note for evaluating the impacts of the proposed FSQL school upgrading intervention in pilot areas on learning outcomes and other important key performance indicator are developed in Chapter 7. In particular, the note describes key performance indicators, the important variables that could be used (and collected) to evaluate the impacts of the FSQL program on the indicators, the process for selecting the treatment and the control schools, the impact identification strategy, and the appropriate sample size for each group.

Three broad aspects of the policy intervention could be evaluated at the individual student level:

1. The impact on students' schooling outcomes from upgrading "Protected" schools to meet the required FSQL standards
2. The impact on schooling outcomes of students who will be relocated from closed down "Affiliated" schools to upgraded and expanding "Hub" schools
3. The impact on schooling outcomes of students already enrolled in expanding Hub schools

In addition to assessing the impacts of the intervention, it is also very important to put in place a "process monitoring" strategy during the pilot stage: that is, to put in place a way to capture the "story" of how a particular geographical area managed to consolidate its school network. Was it a charismatic major that did the difference? What was the dynamics at town hall meetings? What messages delivered (and by whom) appear to have made a difference? Given the size of the challenge Thailand faces, it will need to have in place a way to systematically learn from and spread successful practices.

1. Introduction

> ***There is considerable scope for improving Thai students' learning outcomes and reducing achievement disparities if the challenges of teacher misallocation and inadequate school facilities and learning materials are addressed.*** *As will be shown in this report, reorganizing the school network and redistributing existing teachers would completely eliminate the chronic teacher shortage, yielding massive efficiency gain. This reform will: (a) reduce the numbers of small schools considerably without significantly affecting student access, (b) reduce the need to equip small schools with more teachers/school facilities, and (c) avoid the persistent increase in per student spending. Furthermore, the upgrading of school physical environment could also be carried out much more cost efficiently with the much smaller number of schools. Finally, these changes would directly address pervasive inequalities, by offering better educational opportunities for the most disadvantaged students.*

World Bank (2018) report concludes that Thailand's basic education sector is inefficient; with high and rising per-student spending relative to performance, and worsening learning outcome inequality. The bulk of basic education spending inefficiency could be traced overwhelmingly to the primary level. At this education level, Thailand is spending substantially more than the level expected given its GDP per capita. The latest data (UNESCO Institute for Statistics, 2018 or latest) indicate that at Thailand's level of economic development, it is expected that the country would spend around 16 percent of GDP per capita per primary student. However, the country is spending more than 23 percent of its GDP per capita on primary student. This spending level is the highest observed among economies in EAP, and is the 18th highest out of 118 countries in the world which reported the statistics.

Ineffective teacher allocation is the most important driver of the spending inefficiency. Thailand's student-teacher ratio of 16:1 at the primary level[9] is not low by international standard (on par with more advanced education systems such as Australia, Japan, Korea, Canada and Great Britain). However, when class size is considered, Thai primary schools have among the smallest average class size compared to the 39 countries which reported the statistics to OECD. The average class size of 16.7 in Thailand is much smaller than in Australia (23.5), Japan (27.3), Korea (23.3), and Great Britain (27). The cost-inefficiency, therefore, arises from the existence of too many small schools, resulting in poor teacher allocation. In other words, teachers (and other educational resources) are being spread very thinly across too many small classrooms.

Specifically, around 57 percent of Thai schools are small (68 percent for primary schools) – defined as having less than 20 students per grade on average. Most small schools are chronically short of teachers (defined as having an average teacher-to-class ratio of less than one), despite the system employing more than enough teachers (as indicated by the low system-wide student-teacher ratio). These schools are unable to conduct classes across different grades at the same time, unless they employ multi-grade teaching and/or hire extra (and temporary) non-civil servant teachers out of

[9] The latest data for Thailand is obtained from UNESCO Institute for Statistics (2017). However, the 2019 data from the Office of the Basic Education Commission (OBEC) indicates that the pupil-teacher ratio for OBEC primary schools is even lower at 13.4:1.

their own resources to relieve the shortage. Teachers in these small schools typically have to cover many more subjects and grades than their counterparts in larger schools.

Another aspect of the misallocation of teachers is that larger schools have both greater than one teacher-to-class ratio, but much larger class size. These larger schools are overwhelmingly in urban areas, as a result of migration from rural areas (in line with expectations as the country undergoes its economic transformation) which has meant schools have been forced to grow in size. Some of the very large schools (i.e., those above 2,000 pupils)[10] are likely to be challenging settings to provide a quality education at the primary level since young children will not receive the nurturing environment and close relationships with teachers and their peers that they need.

The problem of small school proliferation, and declining school quality, will get worse if no action is taken, with the declining trend in birth rates. According to the UN population projections (2017 revision), the number of K-12 school-age children (age 4-18 years) is expected to drop by 1.95 million, or more than 15 percent over the next decade. In fact, the declining trend in the number of students has been observed for more than 30 years, yet no significant action was taken to downsize the school network to match the dwindling student population. The end-result is that more and more schools in Thailand have become chronically understaffed and poorly equipped[11] as teachers and other resources are spread among ever larger number of small classrooms, while per-student public spending has continued to rise. The increase in per student cost in Thailand, therefore, was not a result of efforts to improve education quality. Most small schools continue to suffer from chronic teacher shortage, even though the total number of teachers has risen by 15 percent while the total number of students has fallen by a similar percentage over the 2010-2019 period.

Key results from World Bank (2015) reveal that eliminating teacher shortages to cater to the current distribution of schools, both in terms of quality and quantity, would result in significant improvements in student achievement and the impacts would be greatest for lower-performing schools serving socioeconomically disadvantaged students. The analysis of the effects of measured teacher quality and the teacher-to-class ratio unambiguously suggest that allocating more and better teachers to small and low-performing schools would result in significant improvements in student learning. However, given the severity of understaffing in the many small schools, a massive outlay would be required if all classrooms in this oversized school network are to be staffed adequately.

Substantial outlay would also likely be needed to bring school facilities and educational materials in the disadvantaged schools up to basic standards (World Bank, 2018). Although there is no readily available direct information on school infrastructure and educational materials in Thailand, the results from the PISA 2015 survey of school principals suggest that small village schools serving disadvantaged children[12] are also inadequately endowed with educational materials and

[10] According to OBEC (2019), 422 schools have 2,000 or more students enrolled. The average teacher-to-class ratio for these schools is 2.11, while the average class size is 38.4 (range between 30 to 50)

[11] Many small rural schools also have inadequate infrastructure and facilities (World Bank, 2015).

[12] Advantaged (Disadvantaged) schools are those schools which are ranked in the top (bottom) 25 percent in terms of average student body Economic, Social, and Cultural Status (ESCS) index. The PISA ESCS index was derived from the following three indices: highest occupational status of parents, highest education level of parents, and home possessions. The index of home possessions comprises all items on the indices of family wealth, cultural possessions, home educational resources, as well as books in the home.

infrastructure. Eliminating these shortages would likely improve the performance of the disadvantaged students further. The 2018 World Bank EAP regional study[13] finds that top performing and above average performing education systems in EAP manage two essential inputs efficiently: teachers and school infrastructure. With regard to infrastructure investment, the high performing education systems ensure that all schools are provided simple, but functional school buildings and basic facilities. The report cites many evidences from around the world, which show that providing adequate school facilities and learning materials leads to significantly better learning outcomes. Nevertheless, beyond the necessity of meeting basic standards, there is not enough evidence to suggest that greater investment leads to better learning outcomes.

Empirical evidence, both from Thailand and internationally, therefore, suggest that there is considerable scope for improving Thai students' learning outcomes and reducing achievement disparities, if the twin challenges of chronic teacher misallocation and inadequate school facilities and learning materials could be addressed. Tackling this problem in a cost efficient manner should be at the center of Thailand's reform initiatives if the country is to successfully raise the standard of education provision, reduce student performance disparity, and avoid continued increases in per student spending.

[13] World Bank (2018), "Growing Smarter: Learning and Equitable Development in East Asia and Pacific", Washington DC, World Bank.

2. Current Situation Analysis

This chapter investigates the current situation of 29,466 schools under the supervision of the Office of the Basic Education Commission (OBEC).[14] First, the analysis given in Section 2.1 divides schools into two groups ('small' and 'non-small') based on their enrolment size. Key school characteristics are then computed for each group to shed light on the causes of the spending inefficiency and the ineffectiveness of teacher (and other educational resource) allocation. This analysis will show that there are very large shortages of teachers in small schools because of the way that teachers are allocated across schools; and that almost 70,000 more teachers would be needed to staff these small schools adequately based on current allocation patterns.

Section 2.2 then takes a different perspective in classifying schools. Specifically, rather than using only the enrolment size, the classification of schools considers multiple measures of observable school characteristics and inputs which have been empirically shown to be important for student learning in Thailand. In particular, the labels "Advantaged", "Above average", "Average", and "Disadvantaged" are assigned to four groups of schools based on the measured "quality" of their key inputs. The section then concludes with an analysis of the probability of students from different socioeconomic backgrounds enrolling in each of the four school groups in order to reveal the extent of inequitable access to quality education in Thailand.

These two sets of analyses will provide the motivation – taken up in the next chapter – to look for ways in which educational quality can be improved by using the existing educational resources more efficiently.

2.1. Analysis of School Characteristics by Enrolment Size Category

Of the 29,466 schools nationwide under OBEC's supervision, as many as 16,657 (or 57 percent of schools) are considered small. In this report, a school is defined as "Small" if the enrolment size is less than 120 for "Primary" schools, less than 120 for "Secondary" schools, less than 180 for "Opportunity expansion" schools, and less than 240 for "Complete" schools.[15] From Table 2.1 we can see that 1.26 million students (or 19 percent of students) are enrolled in these small schools. The average enrolment size for these 16,657 schools is just 75 and the bulk of the small schools are "Primary" and "Opportunity expansion" schools.

Even though the small schools have very low pupil-teacher ratios, they have a very large number of tiny classes and there are not enough teachers to teach in them. Classes in these schools are half empty, especially in the primary grades, where the average class has less than 9 students. Closer investigation reveals that even though the pupil-teacher ratio for these schools is as low as 9.5:1, the schools are chronically understaffed (defined as having an average teacher-to-class

[14] Around 71 percent of Thai students from pre-primary to grade 12 attend these schools (Office of the Education Council, 2018).

[15] A "Primary" school is defined as a school which has grade levels up to G6; An "Opportunity expansion" school is a school which has primary and lower secondary grades (up to G9); A "Secondary" school is a school which has only secondary grades (G7-G12); and A "Complete" school is a school which has all primary and secondary grades (G1-G12).

ratio of less than one), with teacher-to-class ratio of just 0.94. In the current setting, it is physically impossible for these schools to conduct all classes across different grades at the same time unless multi-grade teaching is employed. The practice could seriously undermine the quality of teaching and learning for these 1.26 million students if teachers are not properly trained and equipped to teach in this manner.

Table 2.1. School Characteristics by Enrolment Size Category - 2019

	All schools		Small schools		Non-small schools	
	Number of schools	Share	Number of schools	Share	Number of schools	Share
Pre-primary	15	0.05%	0	0.00%	15	0.12%
Primary	20,086	68.17%	13,715	82.34%	6,371	49.74%
Opportunity	6,899	23.41%	2,759	16.56%	4,140	32.32%
Secondary	2,353	7.99%	174	1.04%	2,179	17.01%
Complete	113	0.38%	9	0.05%	104	0.81%
Total schools	29,466	100.00%	16,657	100.00%	12,809	100.00%

	Average class size	Number of classes	Average class size	Number of classes	Average class size	Number of classes
Pre-pri	14.06	63,922	8.00	34,162	21.01	29,760
Pri 1	16.96	31,294	9.16	16,098	25.23	15,196
Pri 2	16.79	31,033	9.07	16,142	25.16	14,891
Pri 3	16.15	30,662	8.62	16,144	24.52	14,518
Pri 4	16.53	30,701	8.78	16,197	25.18	14,504
Pri 5	16.68	30,611	8.87	16,155	25.40	14,456
Pri 6	16.90	30,670	9.19	16,173	25.49	14,497
Sec 1	29.58	19,551	12.93	2,905	32.48	16,646
Sec 2	28.84	19,447	12.62	2,931	31.72	16,516
Sec 3	28.66	19,145	12.34	2,922	31.60	16,223
Sec 4	32.10	10,317	11.40	208	32.53	10,109
Sec 5	30.39	10,122	9.70	205	30.82	9,917
Sec 6	29.40	10,038	8.69	210	29.84	9,828
Total classes	337,513		140,452		197,061	
Total teachers	467,115		132,157		334,958	
Teachers req	542,851		200,441		342,410	
Total students	6,607,564		1,257,357		5,350,207	
Avg enrolment	224		75		418	

The 12,809 non-small group of schools, on the other hand, have much larger classes and higher pupil-teacher ratios. Nevertheless, their teacher-to-class ratio of 1.7 is almost twice as high as that for the small schools. Around 5.35 million students are enrolled in the non-small group of schools, whose enrolment size average 418 students. From Table 2.1, we can see that these schools

are nearly 6 times larger than the small schools in terms of student enrolment, while their classes are nearly 3 times larger. Even with their much higher pupil-teacher ratio of 16:1, their classes are much better-staffed as is reflected in the teacher-to-class ratio of 1.7:1, which is almost twice as high as that for the small schools.

The observed spending inefficiency and ineffectiveness of teacher and other educational resource allocation is thus a result of the existence of too many small schools with tiny classes. As will be elaborated in the next chapter, the per-student costs for the small schools are several times greater than those for the larger schools. The analysis surrounding Table 2.1 makes clear that teachers and other educational resources are being spread too thinly across too many small classes. The massively ineffective teacher allocation means that too many Thai classrooms are facing chronic teacher shortages, and that their students are disadvantaged as a result. Therefore, the small average class size and low pupil-teacher ratio in Thai schools do not reflect a high quality learning environment. Instead, the existence of too many half empty classrooms in this oversized school network actually reflects huge misallocation of educational resources and great spending inefficiency.

If the current distribution and size of schools remains as it is, there would be a need to recruit, train, and deploy nearly 76,000 additional teachers in order to adequately staff all classes in Thai schools. We close this section by applying the teacher demand model (see Annex 2.1 at the end of this chapter for technical details and underlying assumptions) to all OBEC schools to accurately quantify the extent of teacher shortage across the entire system. Table 2.1 shows that the total number of teachers in OBEC schools is 467,115 but the number of teachers required to staff all existing classes adequately is 542,851. Therefore, if no action is taken to reorganize the vast school network, then it would be necessary to recruit, train, and deploy almost 76,000 additional teachers to eliminate the teacher shortage across all 337,513 existing classrooms. The shortage is much more acute among the small schools, where it is estimated that 68,284 additional teachers are needed – a massive increase of 52 percent in their teaching force. Needless to say, adequately staffing all classes in these small schools under the current situation would require lowering their (already very low) pupil-teacher ratio further, which would in turn lead to a sharp increase in their per-student cost. A much more cost-efficient approach is to reorganize the oversized school network by merging small schools into designated hub schools – an important topic to which the entire Chapter 3 is dedicated.

2.2. The Inequality of Access to Quality Education

This section looks at the extent to which schools have the inputs they need to provide good quality education and the characteristics of children attending differently-resourced schools.

Schools are first classified into groups based on a number of observable school characteristics.[16] Specifically, schools[17] are assigned into 4 groups (labelled "Advantaged", "Above average", "Average", and "Disadvantaged") based on a number of key observable characteristics and

[16] k-means clustering algorithm is employed to assign schools into 4 distinct groups based on key observable school characteristics.

[17] Only schools with primary level students (i.e. those schools which are defined as "Primary", "Opportunity expansion", and "Complete") are considered in this exercise.

inputs, which recent World Bank (2015) study[18] has identified as important determinants of student learning outcome in Thai schools. These are: i) Total students enrolled; ii) Total teachers; iii) Teacher-to-class ratio; iv) Share of teachers with higher than bachelor degree qualification; v) Share of assistant teachers[19]; vi) Share of teachers with professional ranking or higher[20]; vii) Principal has master's degree qualification or higher; viii) Principal has expert ranking or higher; and ix) Principal missing.[21] The results of this exercise are given in Table 2.2, where the means of the nine characteristics, as well as the standard deviations and the minimums and maximums are presented for each school group. After observing the groups' average school input characteristics, it is quite obvious how the labels "Advantaged", "Above average", "Average", and "Disadvantaged" should be assigned.

Teachers are highly inequitably distributed and small schools are clearly much more disadvantaged compared to larger schools. Consider first the "Disadvantaged" group of schools. Table 2.2 indicates that as many as 77 percent of Thai schools are classified in this group, while 42 percent (nearly 1.9 million students) of the student population attend these schools. On average, the Disadvantaged schools have only 91 enrolled students and 7.6 teachers. Clearly, the very low pupil-teacher ratio of around 12:1 does not reflect that the schools are of high quality. On the contrary, the average teacher-to-class ratio variable of 1.01 indicates that these schools are severely understaffed. Virtually the entirety of schools defined as "Small" are classified as Disadvantaged schools. To put things into perspective, consider now the "Advantaged" school group. Only 0.6 percent of Thai schools are in this category, while 8 percent (358,334) of the student population are enrolled in these schools. On average, the Advantaged schools have 2,133 enrolled students and 81.7 teachers each. Even though the average pupil-teacher ratio of around 26:1 is much higher than that of the Disadvantaged group, the average teacher-to-class ratio of 1.78 is much greater. There are strong empirical evidences which suggest that the teacher-to-class ratio variable is more relevant for school quality than the pupil-teacher ratio or class size variables, especially in the Thai context where most schools are small and understaffed.

Teachers and school principals in the Advantaged schools are also more highly qualified, both in terms of educational qualification and academic ranking. Not only are the Disadvantaged schools inadequately staffed, all of the personnel quality indicators are also much worse than those for the Advantaged group. For instance, Table 2.2 shows that while 31 percent of the teachers in Advantaged schools possess higher than Bachelor degree qualifications, the corresponding figure for the Disadvantaged schools is less than 18 percent. Likewise, while 24.4 percent of school principals in the Advantaged schools attained expert academic ranking or higher, only 0.3 percent of their counterparts in Disadvantaged schools managed to do so. Moreover, almost 39 percent of teachers in the Disadvantaged schools hold the position of "Assistant teachers" compared to only 9.5 percent in

[18] Lathapipat D. and L. Sondergaard (2015): "Thailand - Wanted: A Quality Education for All," Report No. AUS13333, Washington, D.C., World Bank Group.

[19] Around 75% of teachers in OBEC schools hold the position of "Teachers", while the rest are "Assistant teachers." The Assistant teachers have no academic ranking (see footnote below) and more than 70 percent of them are "Temporary employees."

[20] The academic ranking for educational personnel (teachers and school administrators) consists of: i) No academic ranking; ii) Professional; iii) Senior professional; iv) Expert; and v) Senior expert.

[21] Of the 26,963 schools we analyze in this exercise, 2,829 schools do not report any data or do not have school principals. The majority of these (2,402) are "small" schools. It is therefore important to include the indicator variable for "Principal missing" rather than dropping these schools from the dataset.

the Advantaged schools. The Assistant teachers have no academic ranking and more than 70 percent of them are classified as "Temporary employees."

With regards to learning outcomes, the learning gaps between students in the Advantaged schools and in the other school groups are quite large. Table 2.2 also shows the 2017 Ordinary National Education Test (O-NET) exam results for Grade 6 in mathematics. We can see from the table that the average test score for the Advantaged schools is much higher than the other schools. Interested readers are referred to Lathapipat D. and L. Sondergaard (2015) for evidences of the association between ONET test scores and key school inputs. The study finds that eliminating teacher shortages and allocating better qualified and more experienced teachers to these small disadvantaged schools would likely raise overall performance and reduce learning outcome inequality.

Moreover, non-poor students are 8 times more likely to attend "Advantaged" and 3 times more likely to attend "Above average" or better quality schools than the Poor and the Very Poor. Table 2.3 shows that 1.21 and 1.44 percent of the "Very poor" and "Poor" students respectively are enrolled in the Advantaged schools, while 11.1 percent of the "Non-poor" are enrolled in these schools. Similarly, while nearly 30 percent of the Non-poor students attend Above-average or better quality schools, less than 10 percent of the Poor and the Very poor are enrolled in these schools. Given the observed resource allocation inequality and the over-representation of the Poor and the Very poor students in Disadvantaged schools, it is not hard to see that if left unattended, the educational inequality between socio-economic groups will continue to perpetuate social and economic inequality in the country.

Empirical evidence established in this chapter, as well as from recent World Bank reports, suggest that there is considerable scope for improving Thai students' learning outcomes and reducing achievement disparities. However, achieving these goals requires that Thailand urgently embarks on addressing the challenges of chronic teacher and other educational resource misallocations. Tackling this problem in a cost-efficient manner should be at the center of Thailand's reform initiatives if the country is to successfully raise the standard of education provision and reduce student outcome inequality.

Table 2.2 Characteristics of Schools under the Office of the Basic Education Commission

	Advantaged				Above average				Average				Disadvantaged			
	Mean	*SD*	*Min*	*Max*	Mean	*SD*	*Min*	*Max*	Mean	*SD*	*Min*	*Max*	Mean	*SD*	*Min*	*Max*
Total students enrolled	2,133	*593*	*1,507*	*4,426*	873	*235*	*585*	*1,499*	296	*94*	*194*	*584*	91	*47*	*1*	*193*
Teacher-to-class ratio	1.784	*0.323*	*1.200*	*3.051*	1.555	*0.312*	*0.467*	*4.636*	1.547	*0.296*	*0.667*	*4.364*	1.007	*0.380*	*0.111*	*4.500*
Total teachers	81.7	*28.9*	*39.0*	*208.0*	34.3	*10.6*	*5.0*	*84.0*	16.0	*5.0*	*3.0*	*57.0*	7.6	*3.8*	*1.0*	*33.0*
Share of teachers with higher than bachelor degree qualification	0.310	*0.108*	*0.019*	*0.598*	0.261	*0.127*	*0.000*	*0.719*	0.231	*0.146*	*0.000*	*0.875*	0.179	*0.178*	*0.000*	*1.000*
Share of assistant teachers	0.095	*0.083*	*0.000*	*0.463*	0.156	*0.099*	*0.000*	*0.543*	0.226	*0.122*	*0.000*	*0.727*	0.386	*0.212*	*0.000*	*1.000*
Share of teachers with professional ranking or higher	0.667	*0.215*	*0.185*	*0.985*	0.529	*0.200*	*0.000*	*0.981*	0.544	*0.201*	*0.000*	*1.000*	0.474	*0.242*	*0.000*	*1.000*
Principal has master's qualification or higher	0.935	*0.248*	*0.000*	*1.000*	0.897	*0.304*	*0.000*	*1.000*	0.873	*0.332*	*0.000*	*1.000*	0.784	*0.412*	*0.000*	*1.000*
Principal has expert ranking or higher	0.244	*0.431*	*0.000*	*1.000*	0.075	*0.264*	*0.000*	*1.000*	0.015	*0.120*	*0.000*	*1.000*	0.003	*0.059*	*0.000*	*1.000*
Principal missing	0.048	*0.214*	*0.000*	*1.000*	0.026	*0.159*	*0.000*	*1.000*	0.037	*0.189*	*0.000*	*1.000*	0.126	*0.332*	*0.000*	*1.000*
Total number of schools	168				731				5374				20674			
Total number of students	358,334				638,083				1,591,832				1,887,847			
Average 2017 ONET G6 (Math)	52.41				44.99				41.50				41.95			
Share of students from different socio groups:																
Non-poor	94.68%				82.37%				66.59%				59.97%			
Poor	3.23%				9.26%				18.80%				22.89%			
Very poor	2.09%				8.37%				14.61%				17.13%			

Table 2.3. Shares of Students Attending Advantaged, Above Average, Average, and Disadvantaged Schools by Socio-Economic Group

	Very poor		Poor		Non-poor	
	No. Students	Percent	No. Students	Percent	No. Students	Percent
Advantaged	7,475	1.21	11,561	1.44	339,284	11.1
Above average	53,393	8.66	59,078	7.37	525,612	17.19
Average	232,566	37.7	299,217	37.31	1,060,049	34.67
Disadvantaged	323,457	52.43	432,215	53.89	1,132,175	37.03
Total	616,891	100.0	802,071	100.0	3,057,120	100.0

Annex 2.1: Teacher Demand Model

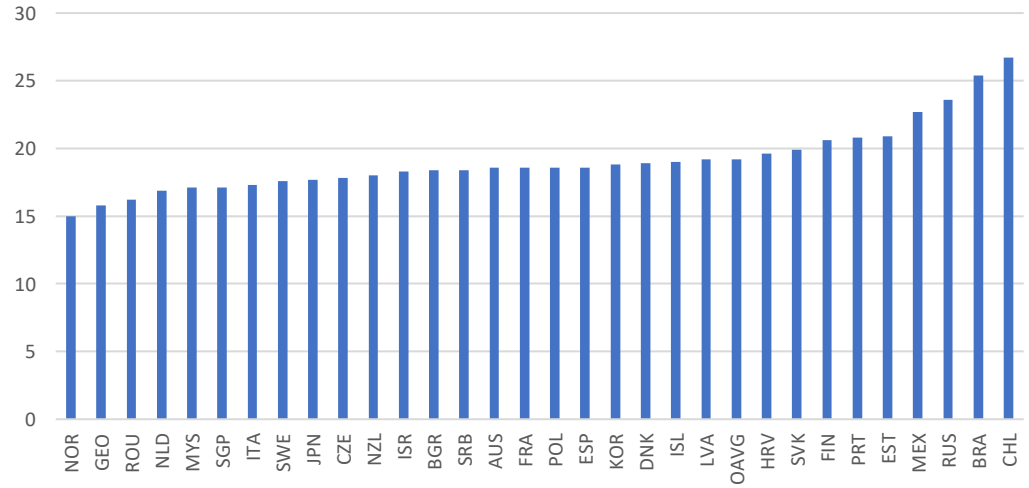
The "teacher demand model" is straight-forward: it simply asks: given Thailand's curriculum (i.e. the hours of math, Thai, etc. that needs teaching); the degree of specialization of each teacher; and teacher teaching loads (i.e. how many hours each teacher is allowed to teach), how many teachers *should* be assigned to a school of a particular size. It is a "model" because, from afar, we do not have the specificities that would determine how many teachers a principal (who has the detailed information of his/her students and the teachers) would want. E.g. we do not know whether a particular physics teacher is also capable of teaching English.

The model is estimated based on the following set of assumptions and parameters:

1. The 8 core subjects taught at the basic education level are divided into 4 specialization areas: i) English, ii) Mathematics and Science, iii) Art, Thai language, Social Science, and Career skill (ATSC), and iv) Physical education (PE)
2. Except for English and PE, teachers at the pre-primary and primary levels can teach all subjects. The model further differentiates between pre-primary and primary teachers
3. English and PE teachers can teach all grade levels from Kindergarten to Grade 12 (Secondary Year 6)
4. Teacher subject specialization (according to the 4 areas) occurs only at the secondary level
5. "Multi-stage" teaching is not allowed in the model so that a pre-primary teacher is not permitted to teach at the primary level (except for English and PE as specified in (3))
6. Each teacher has a teaching load of no more than 20 hours per week (a total of 40 weekly hours is divided into: 50% teaching, 5% formal in-service training, 45% classroom preparation, peer-to-peer learning, school administration, etc.).

Note that the maximum teaching load assumption of 20 hours per week for Thailand is considered quite high by OECD standard. The number of hours spent teaching a group or class of (lower secondary) students, according to the formal policy in the OECD countries, is just over 19 hours on average (see Figure A2.1.1).

Figure A2.1.1. Teaching Hours in OECD Countries
(Lower Secondary, 2013 or latest available)



Source: OECD (2018), Teaching hours (indicator). doi: 10.1787/af23ce9b-en (Accessed on 08 August 2018)

7. Total weekly class hours for preschool, primary, and secondary levels are 24 hours, 25 hours, and 35 hours respectively
8. Total class hours are allocated across subjects according to the following example school:

For illustration, consider a hypothetical school which has 10 pre-primary, 20 primary, and 6 secondary classes. Given the stated assumptions, it is straight forward to calculate the number of teachers required at the school. Consider for example, the number of math/science teacher required at the secondary level for this school. For each secondary class, the school requires 0.25 math teacher (0.25=5 hours of math lessons/20 maximum permissible weekly hours) and 0.25 science teacher. Since a math teacher can also teach science, the number of math/science subject teacher required for each secondary classroom is 0.25+0.25=0.5. Since this example school has 6 secondary classes, the total number of math/science teachers required is then 3. The required number of teachers for other subject areas can be calculated similarly.

Hypothetical school example:

Pre-primary									
	Foreign	Math	Science	Art	Thai	Social	Career	Physical	Total
Total weekly hours/class	3	3	3	3	3	3	3	3	24
Total monthly hours/class	12	12	12	12	12	12	12	12	96
teacher req/class	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	1.2000
Teacher required per class	0.1500	0.9000						0.1500	
# classes									
10	1.500	9.000						1.500	

Primary									
	Foreign	Math	Science	Art	Thai	Social	Career	Physical	Total
Total weekly hours/class	4	3	3	3	3	3	3	3	25
Total monthly hours/class	16	12	12	12	12	12	12	12	100
teacher req/class	0.200	0.150	0.150	0.150	0.150	0.150	0.150	0.150	1.250
Teacher required per class	0.20	0.90						0.15	
# classes									
20	4.000	18.000						3.000	

Secondary									
	Foreign	Math	Science	Art	Thai	Social	Career	Physical	Total
Total weekly hours/class	5	5	5	4	4	4	4	4	35
Total monthly hours/class	20	20	20	16	16	16	16	16	140
teacher req/class	0.250	0.250	0.250	0.200	0.200	0.200	0.200	0.200	1.750
Teacher required per class	0.25	0.500		0.80				0.20	
# classes									
6	1.50	3.00		4.80				1.20	

Teachers required	Foreign	Math	Science	Art	Thai	Social	Career	Physical	
Pre-primary		9.000							
Primary		18.000							
Secondary		3.000		4.800					
All	7.000							5.700	

Total teachers required									
Pre-primary	**-**	**9**	**-**	**-**	**-**	**-**	**-**	**-**	
Primary	**-**	**18**	**-**	**-**	**-**	**-**	**-**	**-**	
Secondary	**-**	**3**	**-**	**5**	**-**	**-**	**-**	**-**	
All	**7**	**-**	**-**	**-**	**-**	**-**	**-**	**6**	
								48	
							Average teacher per class		*1.333333*

The teacher demand model indicates that the total number of teachers required for this school is 48, which can be divided into: 7 English, 9 general pre-primary, 18 general primary, 3 math-science secondary, 5 ATSC secondary, and 6 PE teachers. If staffed adequately, this school would have an average teacher-to-classroom ratio of 1.33. Notice that in this model, the number of teachers a school requires is driven by the number of classes at each schooling level and not by the number of students.

In this report, the maximum allowable class size for pre-primary, primary, and secondary levels are set at 20, 30, and 35 students respectively.

3. Optimizing Educational Resource Allocation through School Network Re-organization

The preceding chapter establishes that the majority of schools in Thailand are chronically short of teachers. This problem is especially acute for small schools serving socio-economically disadvantaged students. As will be discussed in Chapter 4, this chronic shortage is a direct result of the personnel allocation rule which explicitly rations the number of teachers going to small schools. Furthermore, these disadvantaged students are much more likely to be enrolled in schools with less-qualified teachers and principals.

The critical question is: What is the best way of addressing those shortages? Broadly speaking, there are two ways: (1) abandon the personnel allocation rule and, instead, allocate staff in accordance with what the curriculum requires (and teacher working hours). Doing so would involve hiring at least an additional 75,736 teachers, a 16.2 percent increase. Or, alternatively, (2) consolidate the school network to create larger, better resourced schools in which no school faces such shortages. In our opinion, both from an educational perspective and from a cost-efficiency perspective, the second options make more sense. This chapter discusses how such a re-organization could be done.

In more details, this chapter describes the results of a school network reorganization software developed under this project. Particularly, the software is a tool for policymakers to systematically classify schools into 5 mutually exclusive school-type categories to be explained below. These are: i) Hub schools; ii) Affiliated schools; iii) Protected schools; iv) Isolated schools; and v) Large schools. Options for the criteria to be used to determine the 5 school types are provided in the software. These options serve as the policy variables for policymakers and are discussed in detail in Section 3.1. The software will suggest which of the Affiliated schools could be merged with which of the identified Hub schools so that the aggregate travel distance for the students is minimized.

This chapter will present one reorganization option at the national level, with an assessment of the number of schools in each category, and the resulting distribution of size of the remaining Hubs and other schools after the proposed school consolidation simulation. Notice that if a different set of policy variables are chosen, then the resulting number of schools in each school type category, the school size distribution after the proposed school consolidation, the number of teachers required, and the travel distance for the students will also be different.

Even though the simulation results presented in this chapter are at the national level, the government has the option of selecting only a subset of schools in a chosen location (such as a single province or district) to conduct the school network reorganization. This will allow the government to target a fewer number of schools, for instance, in an initial pilot of the reform intervention. Moreover, attention will need to be paid to the realities on the ground in each locale and it may not be possible to fully implement the simulation results in each location.

3.1. Criteria for School Network Reorganization

There are **4 key policy variables**[22] built into the school network reorganization model developed under this project and the model also allows the flexibility of using different parameters for different localities. For ease of exposition, a policy variable will be represented in bold texts in the first encounter in this section.

The first policy variable to be chosen is the setting of a "**locality**." The software allows the option of defining a locality as a **province** or as a **district**. In the baseline case considered here, each locality is chosen to represent a province.

In the first step, the shortest road distances between every school (only schools with primary grade levels are considered in this exercise) in each province are computed in Google Maps. This is important so that the distance pupils would need to travel can be calculated and therefore whether there are some schools which are sufficiently far away from other schools that they should not be included in a local consolidation exercise.

Defining School Size Categories

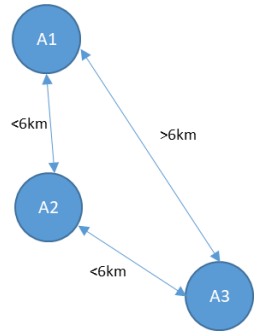
- *Small schools*: A school is classified as "Small" if the enrolment size is less than 120 for "Primary" schools, less than 120 for "Secondary" schools, less than 180 for "Opportunity expansion" schools, and less than 240 for "Complete" schools.[1]
- *Large schools*: A school is classified as "Large" if the enrolment size is greater than 500
- *Non-small schools*: A school is classified as "Non-small" if it is neither "Small" nor "Large"

Note that only the Small and the Non-small schools are considered candidates for school consolidation, and that Secondary schools are not considered in the consolidation exercise.

Possible Set of Policy Parameters Defining Isolated and Protected Schools

- Schools which are more than **6 km travel distance** away from any other schools are defined as "Isolated"
- Small isolated schools are defined as "Protected schools." These schools cannot be closed down as student access will be impaired to an unacceptable degree.

School Clusters



- Define a school cluster as a network of schools, where each school in the cluster is located within the specified 6 km travel distance from at least one other school.
- The example on the left shows three schools; A1, A2 and A3
- School A2 is less than 6 km from School A1, A3 is less than 6 km from School A2
- The 3 schools are assigned to the same cluster even though School A3 is more than 6 km from School A1

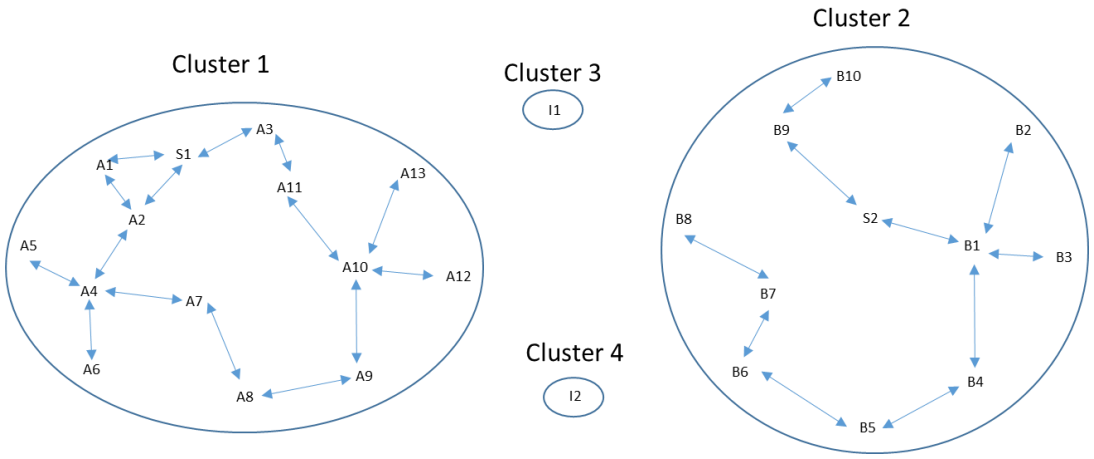
[22] The 4 key policy variables are: i) defining "Locality", ii) 6 km travel distance threshold between schools, iii) the maximum allowable enrolment size of 500, and iv) a permissible hub school must have a "football field" or a "children playground"

- The distance to other school is calculated until there is no other school within 6 km travel distance from any school in the network chain
- These calculations are done for all schools, to generate a set of clusters to which all schools are assigned

- In this example, the algorithm identifies 4 clusters within this hypothetical locality (province)

Note that Clusters 3 and 4 each contains only a single school. These are "Isolated schools" since they are more than 6 km away from any other school

Figure 3.1. School Clusters within a Locality



Imposing a limit on school size

For practical and logistical purposes, it may be worth putting an upper bound on the number of students in each school.

- For instance, consider Cluster 1 in Figure 3.1. While all these schools are close enough together, the total number of pupils in this cluster could be too large to be enrolled in a single school.
- Although somewhat arbitrary, we impose a "**maximum allowable enrolment size**" to be, say, **500** (see Technical Annex to Section 3.1)
- Similarly, we impose that the total student enrolment in the 14 schools in Cluster 1 is 1,200. The proposed number of schools in this cluster is therefore 3 (round up of 1,200/500)

Algorithm for Determining the "Hub" Schools within a School Cluster

Once the number of schools in a cluster is determined, the next question is which school should be used to host all the students in the cluster (the "Hub" school). To continue with our Cluster 1 example. The 3 remaining "Hub" schools in the cluster after school consolidation will have 400 students (1,200/3) each. Only a subset of schools with "**football field**" or "**children playground**" are considered as "**permissible hubs**" so that the Hub schools have the best possible facilities for the larger number of students.

1. For each permissible hub school in the cluster, construct a top 400 ranking of travel distances (in ascending order) from student homes (only for those students attending schools within the cluster) to the school
2. For each permissible hub school, aggregate the 400 shortest travel distances to students' homes
3. The school with the minimum aggregate distance to students' homes is assigned the label "Hub" school
4. Remove the Hub school and the 400 students assigned to the school from the cluster to determine the remaining Hub schools.

Repeat steps (1) through (4) for the remaining permissible hub schools and students not yet assigned to any Hub school until all 3 Hub schools are selected and all students are assigned to the Hub schools. The schools within the cluster which are not Hub schools are defined as "Affiliated" schools. These are the schools to be closed down through the process of school network reorganization.

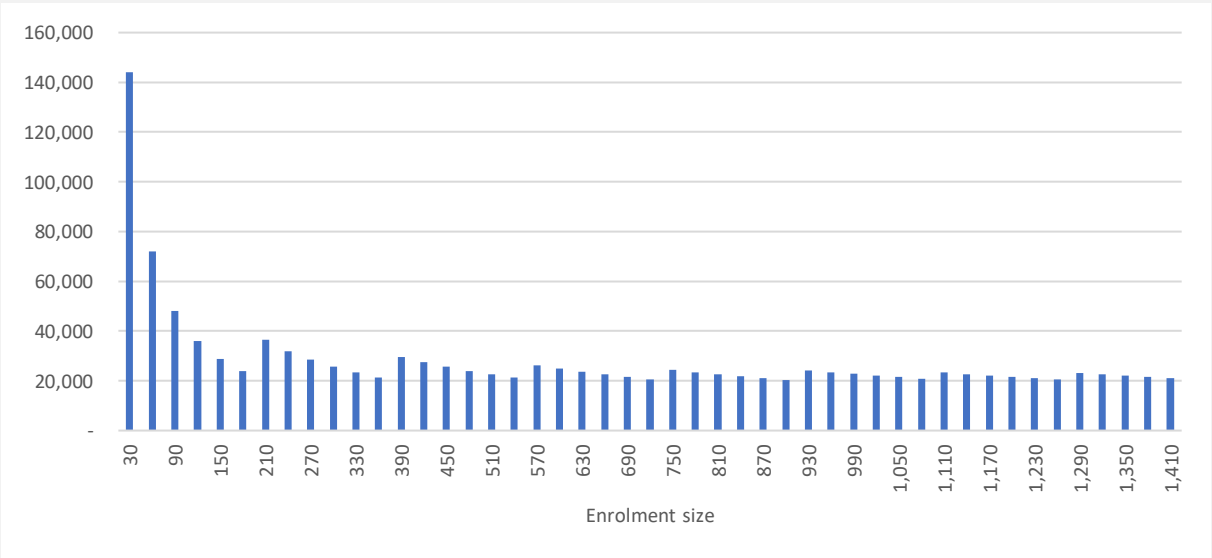
Technical Annex to Section 3.1

Where Should the Maximum Allowable Enrolment Size Parameter Be Set?

Notice that we have initially set the maximum allowable enrolment size at 500 students in the school network optimization simulation. Why was this number chosen? To answer this question, consider a primary school with 6 grades where the students are equally distributed across the grades.

- Employing the teacher demand model from Chapter 2 (see Annex 2.1), the number of teachers required to staff all classes adequately can be computed
- Assuming that average teacher monthly salary is THB 40,000, we can calculate the annual teacher salary expense per student
- Plotting the annual teacher salary expense per student against enrolment size as shown in Figure A3.1, we can see that the reduction in teacher salary expense per-student becomes small when enrolment size increases to around 500 students

Figure A3.1. Annual Teacher Salary Expense (THB) Per Student - Primary School



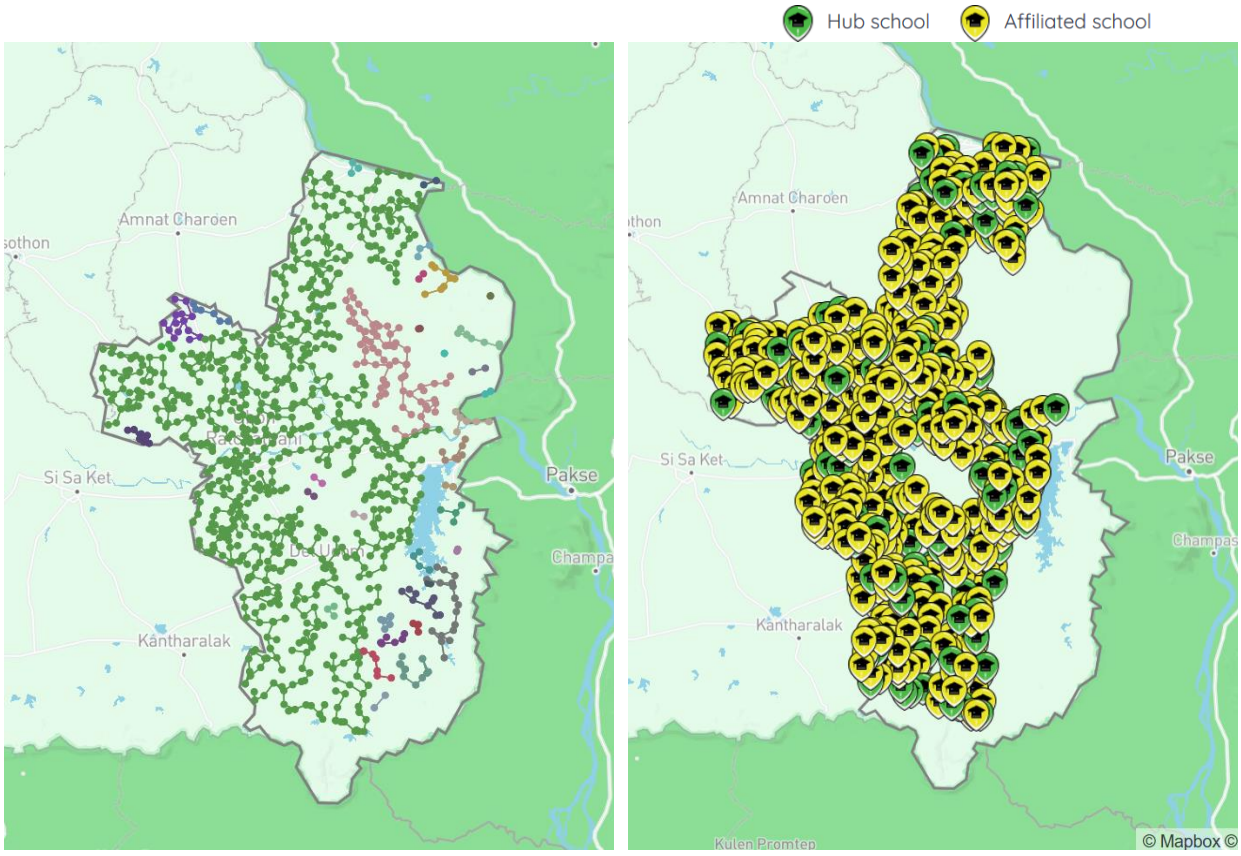
3.2. School Network Consolidation Simulation Results

The school network reorganization methodology discussed above provides a tool for policymakers to systematically classify schools into 5 *mutually exclusive* school-type categories. These are:

1. **Hub schools**: Enrolment size of less than 500 (prior to consolidation), located within a cluster, has a football pitch or a children playground, and selected as "Hub" by the School Network Consolidation Algorithm (see Box 3.1)
2. **Affiliated schools**: Enrolment size of less than 500, located within a cluster, and NOT selected as "Hub" by the algorithm
3. **Protected schools**: Small and Isolated (located more than 6 km from any other school)
4. **Isolated schools**: Non-small and isolated
5. **Large schools**: Enrolment size of more than or equal to 500 students

For example, in Ubon Ratchathani province where there are 1,119 schools and 212,819 K-12 students, the model has identified 20 Protected schools, 100 Isolated and Large schools, and 36 school clusters containing 999 schools, of which 271 are Hub schools and 728 are Affiliated schools which could be consolidated.

Figure 3.2. School Network Reorganization Simulation– Ubon Ratchathani Province



An output from the software for Ubon Ratchathani province is presented in Figure 3.2. On the left-hand panel, each dot on the map represents a school, while schools located within the same cluster are marked using the same color and are connected into a web using straight lines. The right-hand panel shows the output for the largest school cluster in the province. In the diagram, the Hub schools selected by the optimization algorithm are marked in green, while the Affiliated schools, which will be consolidated into the Hub schools, are marked in yellow.

At the national level, a total of 1,155 Protected schools are identified. These schools are chronically understaffed. The results presented in Table 3.1 show that 1,155 small schools are classified as Protected and that 90,348 students attend these schools. These schools are chronically understaffed (teacher-to-class ratio of 0.95) as there are only 9,484 teachers, while 14,306 teachers are needed; a required increase of at least 51 percent. On the other hand, there is a slight surplus of teachers in the 4,370 Isolated and Large schools (teacher-to-class ratio of 1.89), where almost 3.5 million students are enrolled.

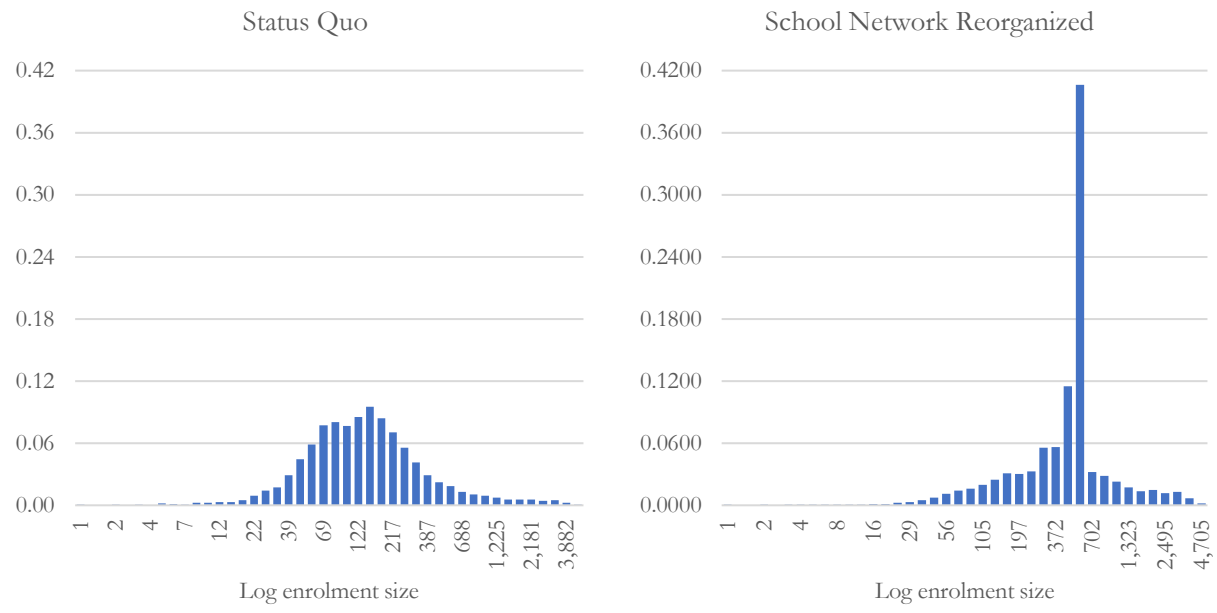
The reorganization model suggests that as many as 17,120 Affiliated schools could be merged with 6,821 Hub schools, using the parameters previously specified. Table 3.1 shows that around 3.05 million students are enrolled in the 23,941 Hub and Affiliated schools. Class sizes in these schools can be seen to be very small, especially for the Affiliated schools where primary level classes average less than 13 students. These schools are also understaffed (teacher-to-class ratios of 1.29 and 1.08 for Hub and Affiliated schools respectively) and the teacher demand model suggests that a total of 330,669 teachers are required to adequately staff all classes in these schools, a 31 percent increase from the current teaching force. At the aggregate level, as many as 542,851 teachers are needed to adequately staff all classes in Thai schools, a 16.2 percent increase over the current total teaching force of 467,115. However, the model suggests that as many as 17,120 Affiliated schools could be consolidated into the 6,821 Hub schools without impairing student access.

Table 3.1. Characteristics of Schools by School Type Category – Status Quo

	Hub schools		Affiliated schools		Protected schools		Isolated or large schools	
	Number of schools	Share	Number of schools	Share	Number of schools	Share	Number of schools	Share
Kindergarten	0	0.00%	0	0.00%	0	0.00%	15	0.34%
Primary	4,419	64.79%	13,717	80.12%	897	77.66%	1,053	24.10%
Opportunity	2,382	34.92%	3,389	19.80%	258	22.34%	870	19.91%
Secondary	0	0.00%	0	0.00%	0	0.00%	2,353	53.84%
Complete	20	0.29%	14	0.08%	0	0.00%	79	1.81%
Total schools	6,821	100.00%	17,120	100.00%	1,155	100.00%	4,370	100.00%

	Average class size	Number of classes	Average class size	Number of classes	Average class size	Number of classes	Average class size	Number of classes
Preschool	15.05	15,729	11.09	36,651	8.51	2,351	25.59	9,191
Pri 1	17.60	7,504	12.86	17,308	9.78	1,141	30.90	5,341
Pri 2	17.37	7,450	12.69	17,290	9.16	1,139	31.39	5,154
Pri 3	16.70	7,318	12.08	17,233	8.75	1,129	31.09	4,982
Pri 4	17.22	7,338	12.38	17,247	8.60	1,138	31.69	4,978
Pri 5	17.34	7,310	12.47	17,227	8.82	1,132	32.18	4,942
Pri 6	17.65	7,331	12.72	17,260	9.00	1,135	32.18	4,944
Sec 1	21.09	2,604	17.93	3,509	12.06	254	34.69	13,184
Sec 2	20.26	2,605	17.37	3,522	11.64	257	33.98	13,063
Sec 3	19.35	2,584	16.59	3,491	11.05	257	34.18	12,813
Sec 4	19.72	25	14.50	14	0.00	0	32.16	10,278
Sec 5	16.04	25	13.71	14	0.00	0	30.45	10,083
Sec 6	15.04	26	11.33	15	0.00	0	29.47	9,997
Total classes	67,849		150,781		9,933		108,950	
Total teachers	87,676		163,508		9,484		206,447	
Teachers req	106,913		223,756		14,306		197,876	
Total students	1,162,150		1,887,141		90,348		3,467,925	
Avg enrolment	170		110		78		794	

Figure 3.3. School Size Distributions under Status Quo (Left) and School Network Reorganization (Right)



With careful planning and support, the Hub and the Affiliated schools could be re-organized into fewer but larger and better resourced-schools. As stated in the preceding paragraph, the 23,941 Hub and Affiliated schools could be merged into just 6,821 schools. A total of 12,346 schools

would thus remain after the reorganization and their enrolment size distribution would improve significantly (Figure 3.3). The economies of scale resulting from the merger and the appropriate redistribution of existing teachers could certainly reduce or even eliminate the aggregate teacher shortage.

The reorganization would reduce the total number of classes in these schools from 218,630 to 143,211 (see "Merged schools" column in Table 3.2) and increase the average primary level class size to more than 23 students. More importantly, the current teaching force of 251,184 is more than adequate as the teacher demand model indicates that 205,274 teachers are needed to staff the 143,211 classes consisting of 3.05 million students. Even with this reduced number of teachers, the average teacher-to-class ratio for the merged schools would increase to 1.43. Some of the surplus teachers could then be reassigned to the Protected schools, which we have seen that are chronically understaffed. The total number of teachers required by level and area of specialization for the "Merged", "Protected" and "Isolated and Large" schools after the school network optimization, intervention estimated using the teacher demand model, are given in Table 3.3.

Table 3.2. Characteristics of Schools After School Network Reorganization

	All schools		Merged schools		Protected schools		Isolated and large schools	
	Number of schools	Share	Number of schools	Share	Number of schools	Share	Number of schools	Share
Kindergarten	15	0.12%	0	0.00%	0	0.00%	15	0.34%
Primary	2,667	21.60%	717	10.51%	897	77.66%	1,053	24.10%
Opportunity	7,192	58.25%	6,064	88.90%	258	22.34%	870	19.91%
Secondary	2,353	19.06%	0	0.00%	0	0.00%	2,353	53.84%
Complete	119	0.96%	40	0.59%	0	0.00%	79	1.81%
Total schools	12,346	100.00%	6,821	100.00%	1,155	100.00%	4,370	100.00%

	Average class size	Number of classes	Average class size	Number of classes	Average class size	Number of classes	Average class size	Number of classes
Preschool	19.22	46,752	18.28	35,210	8.51	2,351	25.59	9,191
Pri 1	24.63	21,551	23.54	15,069	9.78	1,141	30.90	5,341
Pri 2	24.56	21,225	23.37	14,932	9.16	1,139	31.39	5,154
Pri 3	24.32	20,365	23.18	14,254	8.75	1,129	31.09	4,982
Pri 4	24.45	20,749	23.23	14,633	8.60	1,138	31.69	4,978
Pri 5	24.67	20,695	23.36	14,621	8.82	1,132	32.18	4,942
Pri 6	24.73	20,953	23.46	14,874	9.00	1,135	32.18	4,944
Sec 1	28.83	20,059	17.80	6,621	12.06	254	34.69	13,184
Sec 2	28.28	19,833	17.50	6,513	11.64	257	33.98	13,063
Sec 3	28.25	19,429	16.98	6,359	11.05	257	34.18	12,813
Sec 4	32.09	10,321	16.19	43	0.00	0	32.16	10,278
Sec 5	30.38	10,125	14.12	42	0.00	0	30.45	10,083
Sec 6	29.40	10,037	14.03	40	0.00	0	29.47	9,997

Total classes	262,094	143,211	9,933	108,950
Total teachers	467,115	251,184	9,484	206,447
Teachers req	417,650	205,468	14,306	197,876
Total students	6,607,564	3,049,291	90,348	3,467,925
Avg enrolment	535	447	78	794

Table 3.3. Nationwide Number of Teachers Required under School Network Reorganization

	All schools	Merged schools	Protected schools	Isolated and large schools
English	63,417	31,369	2,513	29,535
Gen pre-primary	48,657	34,870	1,520	12,267
Gen primary	123,684	82,246	6,797	34,641
Math-Science secondary	50,147	12,232	511	37,404
ATSC secondary	79,732	19,087	766	59,879
Physical education	52,013	25,664	2,199	24,150
Total teachers required	417,650	205,468	14,306	197,876

The school network reorganization generated from the specified parameters would reduce the total number of schools nationwide from 29,466 to 12,346 whose infrastructure would be easier to upgrade. The upgrading of school physical environment could also be carried out much more cost effectively with the smaller number of schools. The school network reorganization reform considered in this study, therefore, has the potential to tremendously enhance Thailand's education spending efficiency and quality of education provided.

Due to the natural retirement rates of teachers and school principals, Thailand can gradually consolidate its school network without having to lay off a single teacher in the process. The current age profile of teachers means that it is expected that 80,061 teachers will retire over the next five years, leaving 387,054 teachers. Of course, it is important to be able to continue to recruit new teachers into the profession and on this model 30,402 new teachers could be recruited. It should also be recognized that the reorganization of schools implies that many teachers would have to change their place of work and this might have legal, practical and financial implications. These issues will be discussed in more detail in later chapters.

Table 3.4. Education Personnel Retirement Schedule

	2020	2021	2022	2023	2024	2025
Principal	2,134	2,008	2,099	1,797	1,432	892
Deputy principal	308	250	240	232	185	183
Teachers	20,383	17,940	16,079	13,981	11,678	8,775

Notice that the severity of understaffing in OBEC schools is even greater than is shown in this section if school management personnel (principals and deputy principals) requirement is also taken into account. The discussion so far has considered only the teaching personnel. If the required number of management personnel is also taken into account, the degree of understaffing in the OBEC schools would be significantly greater. A more comprehensive treatment of personnel requirement to adequately staff schools is left for Chapter 7.

It is important to also recognize that the school network reorganization analyses conducted in this report have taken on a static view in regards to the student population. However, as stated in World Bank (2018), the number of K-12 school-age children (age 4-18 years) is expected to drop by 1.95 million, or more than 15 percent over the next decade. In fact, the declining trend has been observed for more than 30 years, yet no meaningful action was taken to downsize the school network to match the dwindling student population. The seemingly drastic recommendation that the total number of schools nationwide be reduced from 29,466 to 12,346 after the reorganization is thus a direct consequence of Thailand's inaction in addressing its oversized school network for a very long time. Given Thailand's demographic trends, further downsizing of the school network may even be necessary in the not-so-distant future.

3.3. Analysis of Student Travel Distance to School

A key element of maintaining school access is ensuring that pupils travel a reasonable distance to school. The calculations performed in this section use the baseline assumptions stated in Section 3.1, which include the condition that each student would attend the school closest to his/her place of residence after the school network has been fully reorganized. The distance that children travel to school would obviously vary if these assumptions are changed. The analysis does not consider the 2.11 million students enrolled in Secondary schools since these schools are not part of the reorganization plan.

Even with the much smaller number of schools emerging from the model, the average travel distance is estimated to decline. The average travel distance for the 4.49 million students enrolled in OBEC schools (excluding students in Secondary schools, which are not part of the reorganization plan) would decline by about 150 meters - from 5.50 km to 5.36 km (a 2.6 percent reduction) after the reorganization (Table 3.5). Of the 4.49 million students, 1,228,836 students would travel less than before (27.3 percent); 2,268,297 would travel the same distance (50.5 percent); and 996,687 would have to travel to school further than before (22.2 percent). The decline in the average travel distance may seem counterintuitive at first glance. This is due to the school network reorganization algorithm which selects which of the Affiliated schools should be merged with which of the identified Hub schools so that the aggregate travel distance for all affected students is minimized. In other words, the implicit assumption behind the model is that after the reorganization, every student would "choose" to attend the school located closest to home.

Table 3.5. Estimated Student Travel Distance to School Pre- and Post-Reorganization

		Distance to school (km)		
	Number of students	Status quo	Reorganized	Difference (km)
Non-poor	3,066,201	4.431	4.208	-0.223
Poor	804,759	7.537	7.559	0.022
Very poor	622,860	8.164	8.199	0.035
All	4,493,820	5.505	5.362	-0.143

An important finding is that, despite the large number of school closures, the poor and very poor would only experience a minor change in their average travel distance – increasing by 20 to 40 meters, respectively. As shown in Table 3.5, non-poor students would be travelling less to school than before. The poor and the very poor students, on the hand, would be travelling slightly further after the reorganization.

Nonetheless, there is a slight reduction in the number of students who would have to travel very long distances (more than 50 km) to their schools. Table 3.6 shows that the number of students who would have to travel more than 50 km to school would decline slightly from 93,991 to 92,765 as a result of the reorganization. Interestingly, by this measure, we can see that the poor and the very poor would benefit more than the non-poor students. However, more students across all three socio-economic groups would need to travel more than 10 km to school after the reorganization.

Table 3.6. Students Travelling Long Distances to School Pre- and Post-Reorganization

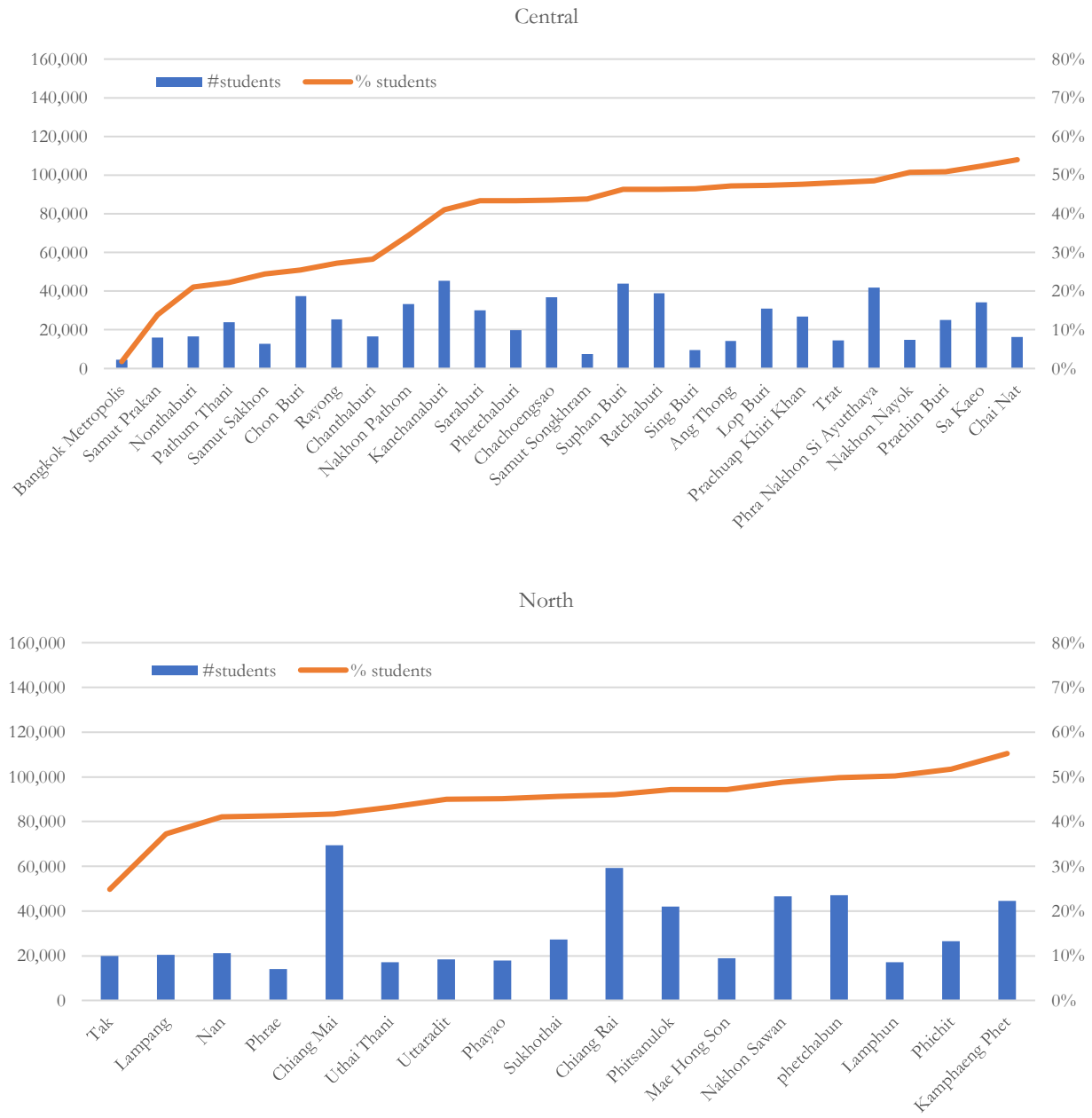
	Status quo			Reorganized		
	>10 km	>30 km	>50 km	>10 km	>30 km	>50 km
Non-poor	202,717	49,332	36,537	214,180	49,661	36,682
Poor	96,957	39,705	31,571	101,317	38,742	30,761
Very poor	89,994	33,733	25,883	93,427	33,036	25,322
All	389,668	122,770	93,991	408,924	121,439	92,765

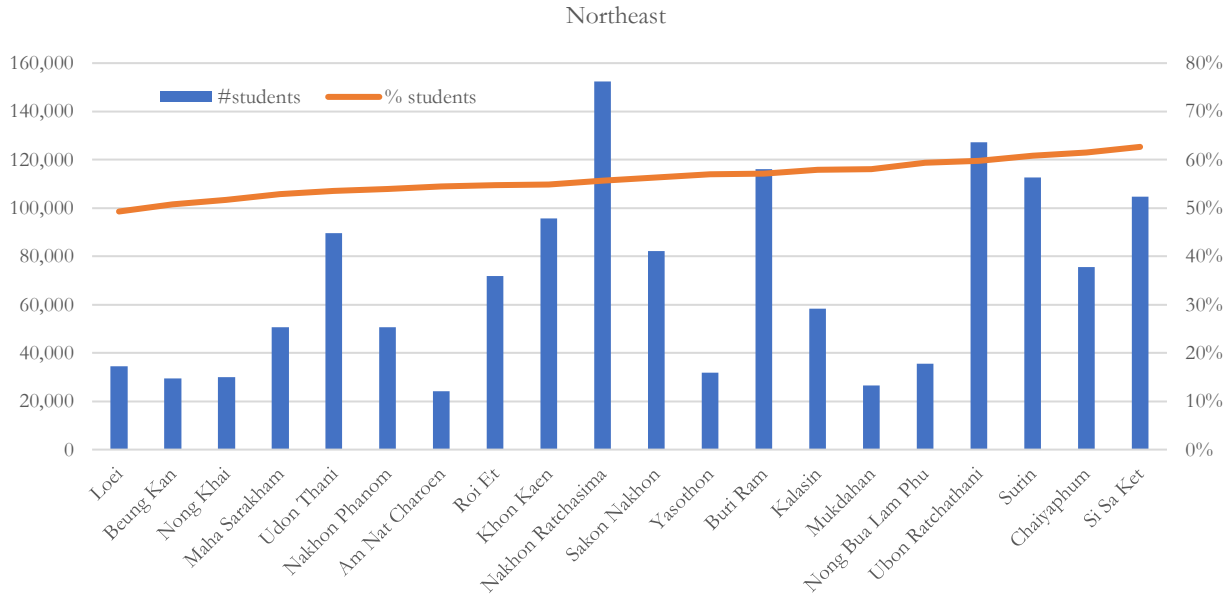
It should be noted that these calculations are based on actual road distances between schools and the sub-districts of students' homes. In some cases, the travel distance may in fact be more than calculated under the model if, for instance, the shortest route has poor road condition and an alternative route has to be taken as a result. These issues would need to be considered when moving towards implementation of school consolidation.

The reorganization would affect millions of students and teachers. With an estimated 58 percent of the current schools to be closed, more than 3 million students would be affected (those students in the Hub and the Affiliated schools) and the majority of them would be expected to attend school in a different location. Geographically, the provinces of Nakhon Ratchasima, Ubon Ratchathani, Buri Ram, Surin, and Si Sa Ket would be more affected than others in terms of number of students affected. These 5 provinces are all in the Northeastern region of Thailand and they account 20.1 percent of the total affected students. In terms of share of students in the province affected, Pattani (South) and Si Sa Ket would come out on top, each with an estimated 91 percent of their children affected. According

to this measure, the three conflict-affected southernmost provinces of Thailand would all be greatly affected, with an estimated 91 percent of students in Pattani, 85 percent in Narathiwat, and 81 percent in Yala affected by the reorganization (Figure 3.4). Furthermore, socio-economically, the poorest students would be the most affected. Importantly, though, we find that despite the large number of school closures, the average travel distance which the poor and the very poor travel would remain virtually unchanged – increasing by only 22 and 35 meters on average respectively.

Figure 3.4. Estimated Number and Share of Students Affected by the School Network Reorganization

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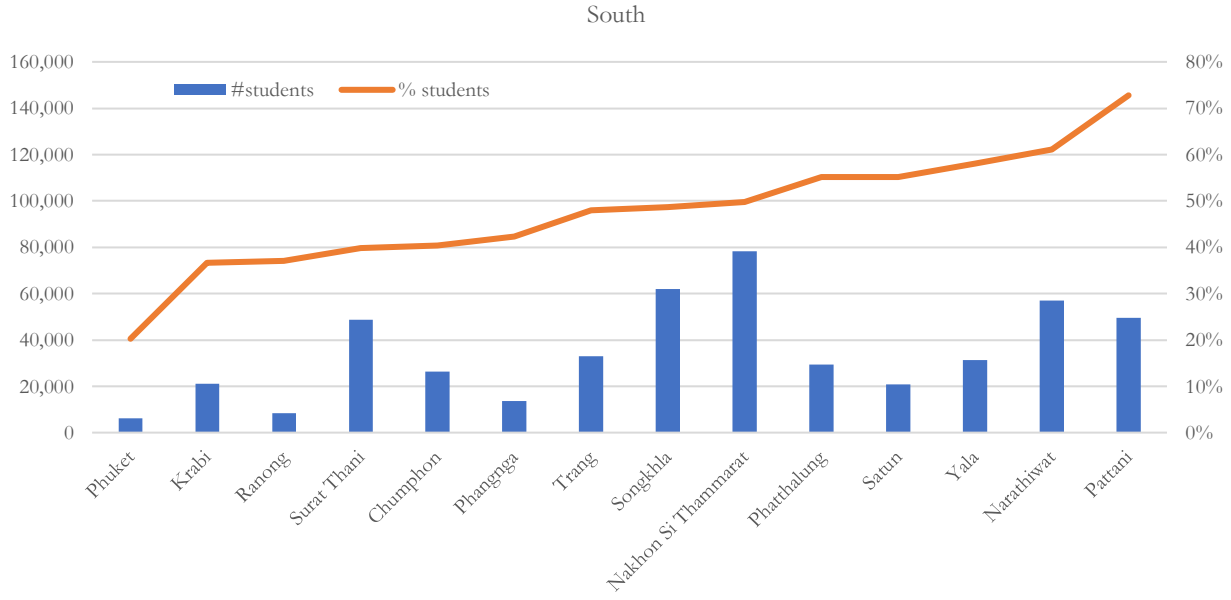
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Nakhon Si Thammarat
Phatthalung
Satun
Yala
Narathiwat
Pattani

4. Per-Student Financing Conceptual Framework

This chapter touches on two structural problems in the way Thailand's network is managed: a flawed education personnel allocation criteria; and a funding model which provides incentives for local actors to focus on inputs, not outputs. The main shortcomings of the current educational personnel allocation criteria for Thai public schools are identified. The analysis finds clear evidence that the Teacher Civil Service and Educational Personnel Commission (TEPC) allocation rules are severely penalizing small schools and the mainly disadvantaged students enrolled in them, thereby worsening educational inequality. The Teacher Demand Model, introduced in Chapter 2, is proposed as a solution to address the massive misallocation of teachers by the TEPC rules.

It then argues that educational personnel allocation based on headcount alone is not equitable as higher-qualified and experienced teachers and school managers are seen to gravitate towards larger urban schools. A more equitable distribution of personnel qualification across schools can be achieved if either a greater share of the higher-qualified and experienced personnel can simply be assigned to rural schools, or if a system can be designed to provide the right incentives for such moves.

A basic per-student funding formula, which properly takes into consideration the number of personnel required in each school, while applying the same national average wage rates for teachers and school managers across all schools is recommended as a more equitable option in the long-run. Moreover, Special Hardship Allowance is explored as a viable instrument for providing stronger incentives to attract quality teachers to small remote schools.

The current underprivileged student subsidy is then analyzed and shown to be not as equitable as it should be due to the current budget rationing practice.

The chapter then proceeds to explore and cost out the option of introducing transportation grants to incentivize students and their parents to support the proposed school network reorganization plan. Finally, simulations of total spending are made based on the planned school network reorganization scenario using the proposed per-student funding formula for recurrent expenditure. The results are compared to the actual allocations incurred in 2019 to reveal the potential gain in spending efficiency.

4.1. Educational Personnel Allocation Criteria for Public Schools

Personnel administration of all public school teachers and educational personnel in Thailand is under the supervision of the Teacher Civil Service and Educational Personnel Commission (TEPC). TEPC, a central government agency under the Ministry of Education, established criteria for educational personnel deployment for all public schools. The allocation formulae are explained in detail in Annex 4.1 for five main types of OBEC schools.[23] These are:

[23] In fact, TEPC defined 3 other types of schools. These are: School Type 6 – Special program secondary schools (such as specialized science schools); School Type 7 – Special education schools for disabled students; and School Type 8 – Welfare schools for socioeconomically disadvantaged students. However, analyses of these three types of schools are not addressed in this report.

1. Type 1: Schools with 120 or less enrolled students, which have Preschool-Primary 6 or Primary 1-Primary 6 grades
2. Type 2: Schools with more than 120 enrolled students, which have Preschool-Primary 6 or Primary 1-Primary 6 grades
3. Type 3: Schools with 120 or less enrolled students, which have Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades
4. Type 4: Schools with more than 120 enrolled students, with Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades
5. Type 5: Secondary schools with only secondary grades

The current TEPC personnel allocation rules have the effect that the vast majority of small schools with less than 120 enrolled students (Type 1 and Type 3 schools) have far too few teachers to deliver quality education. Consider for example the personnel deployment criterion for Type 1 schools. We can see from Annex 4.1 that a small primary school with, say, 60 students spread across six grade levels would be allocated only 3 teachers (and on average Type 1 schools receive 3.71 teachers). It is unreasonable to expect that the school would be able to deliver high-quality education as the three teachers would have to teach students in all six grades across all eight subjects. In the language of Chapter 2, this hypothetical school is "chronically short of teachers," with a teacher-to-class ratio of just 0.5.

The Teacher Demand Model discussed in Chapter 2 would allocate 10.94 teachers to the average Type 1 school. Table 4.1 shows that on average, Type 1 schools have 7.92 classes spread across pre-primary and primary grades. The Teacher Demand Model from Chapter 2 (see Annex 2.1) is used to compute the "adequate" allocation of teaching staff to all schools. This allocation formula, represented by "WB-TDM," suggests that as many as 10.94 teachers should be allocated to an average Type 1 school. This is almost 3 times larger than the allocation suggested by the TEPC formula.[24] On the other hand, for the larger Types 2, 4, and 5 schools, the average numbers of teaching staff required per school computed using the TEPC formulae and the WB teacher demand model (WB-TEPC) are not very different.

Nearly 1 million students are currently attending these chronically understaffed schools and they are much more likely to come from lower socioeconomic status families. The analysis surrounding Table 4.1 indicates that students in small schools are systemically disadvantaged by the TEPC's teacher allocation rules. Furthermore, it is important to recognize that the entire 14,664 Type 1 and Type 3 OBEC schools were classified in the "Disadvantaged" group of schools in the analysis performed in Chapter 2 (Section 2.2) based on 9 key observable school and educational input characteristics. As discussed earlier, the poor and the very poor students are much more likely than the non-poor to be enrolled in the Disadvantaged schools. From the analysis given in this section, it

[24] Note that, in Chapter 2, the maximum allowable class sizes for pre-primary, primary, and secondary levels were set at 20, 30, and 35 respectively for the teacher demand model which are smaller than TEPC's corresponding 30, 40, and 40. However, even if the class size parameters of the teacher demand model were adjusted to 30, 40, and 40 for pre-primary, primary, and secondary levels respectively as per TEPC's regulations, the average number of required teacher allocation falls only slightly from 10.94 to 10.71 teachers for the average Type 1 school. The same analysis performed on Type 3 schools yields a similar conclusion. (The results are represented as in Table 4.1 as "WB-TEPC.")

can therefore be concluded that the current personnel allocation rules used by TEPC are at the heart of the equity problem.

Table 4.1. Teaching Staff Allocation by School Type - 2019

	Type 1	Type 2	Type 3	Type 4	Type 5
Preschool	2.069	2.903	2.016	2.494	-
Primary 1	0.972	1.477	0.991	1.256	-
Primary 2	0.975	1.449	0.987	1.235	-
Primary 3	0.975	1.417	0.992	1.208	-
Primary 4	0.979	1.416	0.991	1.207	-
Primary 5	0.975	1.414	0.995	1.200	-
Primary 6	0.977	1.415	0.994	1.206	-
Secondary 1	-	-	0.958	1.183	4.866
Secondary 2	-	-	0.979	1.176	4.832
Secondary 3	-	-	0.971	1.164	4.739
Secondary 4	-	-	0.001	0.033	4.298
Secondary 5	-	-	0.001	0.031	4.219
Secondary 6	-	-	0.001	0.031	4.186
Average #classes in each school	7.92	11.49	10.88	13.42	27.14
Total number of schools	13,805	6,296	859	6,153	2,353
Total number of students	888,100	1,757,790	76,726	1,770,888	2,114,060
Average #teachers required - TEPC	3.71	14.20	9.50	18.75	54.28
Average #teachers required – WB-TEPC	10.71	15.58	16.59	20.41	45.82
Average #teachers required – WB-TDM	10.94	18.43	16.75	22.85	51.34

At the system level, the TEPC personnel allocation criteria indicate that there is a current surplus of educational personnel in the system, while the WB teacher demand model suggests a large shortfall of as much as 111,982 persons, or 24 percent of the educational workforce, if the current network of many small schools is maintained. Table 4.2 presents the results of the calculations of the number of personnel (for both teachers and school managers)[25] required for the 5 Types of schools using the TEPC- and WB teacher demand-framework. The TEPC criteria suggest that 427,998 educational personnel are required nationwide, which is well below the current workforce of 467,155. However, when the WB teacher demand model is employed, the resulting number of personnel required to adequately staff schools turns out to be as high as 579,007 (WB-TDM). This requirement means that as many as 111,982 additional teachers and school managers are needed to be deployed, which is around 24 percent of the current workforce.

Unsurprisingly, a closer look at Table 4.2 reveals that the bulk of the personnel shortages are found in Type 1 and Type 3 schools. Consider first the Type 1 group of schools. The TEPC criteria indicate that 979 schools are understaffed. However, when the WB teacher demand model is employed, nearly the entire population of schools are considered understaffed (13,631 out of 13,805 Type 1 schools). A similar conclusion can be drawn for the Type 3 schools, where 829 out of 859

[25] The management personnel (Principals and Deputy Principals) are not supposed to perform teaching duties in schools. Their deployment guidelines are given in Annex 7.1.

schools are currently short of educational personnel. At the national level, as many as 25,871 out of 29,466 schools are in need of additional personnel (WB-TDM).

Table 4.2. Total Educational Personnel Allocation by School Type - 2019

	Type 1	Type 2	Type 3	Type 4	Type 5	**All schools**
Total #teachers required - TEPC	51,232	89,382	8,164	115,345	127,720	**391,842**
Total #teachers required – WB-TEPC	147,803	98,100	14,248	125,599	107,826	**493,576**
Total #teachers required – WB-TDM	151,066	116,014	14,390	140,576	120,805	**542,851**
Total principals required (=number of schools)	13,805	6,296	859	6,153	2,353	**29,466**
Total deputy principals required - TEPC	-	1,691	-	1,566	3,433	**6,690**
Total personnel required - TEPC	65,037	97,369	9,023	123,064	133,506	**427,998**
Total personnel required – WB-TEPC	161,608	106,087	15,107	133,318	113,612	**529,732**
Total personnel required – WB-TDM	164,871	124,001	15,249	148,295	126,591	**579,007**
Total personnel - actual	**89,998**	**106,793**	**10,122**	**128,518**	**131,684**	**467,115**
#schools with personnel shortage - TEPC	979	1,901	207	2,392	1,264	**6,743**
#schools with personnel shortage – WB-TEPC	13,541	3,713	826	4,235	280	**22,595**
#schools with personnel shortage – WB-TDM	13,631	5,204	829	5,438	769	**25,871**

As discussed in Chapter 3, tackling this educational resource allocation problem in a cost-efficient manner requires that the vast network of schools is reorganized and that limited educational resources are more adequately and equitably redistributed to improve both the quality and equity of the system. Recall that by utilizing the school network reorganization software developed in Chapter 3, we were able to identify as many as 17,120 "Affiliated schools," which could be merged into 6,821 "Hub schools" without significantly affecting student access. The economies of scale resulting from the merger and the appropriate redistribution of existing teachers were found to eliminate the aggregate teacher shortage. To allow direct comparison to the analyses done in this chapter, the 12,346 schools remaining after the re-organization are grouped into the 5 school types as defined by TEPC. The results of this exercise are presented below in Tables 4.3 and 4.4.

If the school network is reorganized, the number of small primary and opportunity expansion schools would be significantly less and they could be adequately staffed. If all the Affiliated schools are merged into Hub schools, the number of small Type 1 primary schools is reduced from 13,805 to just 976 after the mergers. In the terminology used in the earlier chapters, these remaining isolated small schools which could not be merged into any Hub school are called the "Protected schools." Similarly, the number of small Type 3 "Opportunity expansion" schools also decline sharply from 859 to only 90 after the mergers. Needless to say, with their greatly reduced number, the task of adequately staffing these tiny schools becomes much less daunting than before the reorganization. It is interesting to note from Table 4.3 that there is also a big reduction in the number of Type 2 schools to 1,706 from 6,296 before the reorganization. However, the remaining schools have become much larger as can be seen from the average number of classes which has almost doubled from 11.49 to 20.72. Furthermore, the Type 4 group of schools, which is mainly composed of opportunity expansion schools with more than 120 students, is the only group which has seen an increase in the number of schools as a result of the reorganization. The number of schools in this group has expanded from 6,153 to 7,221 and their average number of classes has increased from 18.75 to 20.78. Lastly, the Type

5 school group has not been affected since secondary schools are not included in the proposed school network reorganization process.

Table 4.3. Teaching Staff Allocation by School Type – School Network Reorganized

	Type 1	Type 2	Type 3	Type 4	Type 5
Preschool	2.039	4.971	2.000	4.226	-
Primary 1	0.968	2.761	1.011	2.189	-
Primary 2	0.967	2.678	1.000	2.164	-
Primary 3	0.956	2.576	1.011	2.070	-
Primary 4	0.967	2.576	0.989	2.122	-
Primary 5	0.958	2.580	1.011	2.114	-
Primary 6	0.962	2.583	1.011	2.149	-
Secondary 1	-	-	0.967	1.245	4.866
Secondary 2	-	-	1.000	1.227	4.832
Secondary 3	-	-	0.978	1.192	4.739
Secondary 4	-	-	-	0.029	4.298
Secondary 5	-	-	-	0.027	4.219
Secondary 6	-	-	-	0.026	4.186
Average #classes in each school	7.82	20.72	10.98	20.78	27.14
Total number of schools	976	1,706	90	7,221	2,353
Average #teachers required – WB-TDM	10.86	32.99	16.80	31.64	51.34

Table 4.4. Total Educational Personnel Allocation by School Type – School Network Reorganized

	Type 1	Type 2	Type 3	Type 4	Type 5	**All schools**
Total #teachers required – WB-TDM	10,595	56,282	1,512	228,456	120,805	**417,650**
Total principals required (=#schools)	976	1,706	90	7,221	2,353	**12,346**
Total deputy principals required – TEPC	0	1,759	0	6,501	3,433	**11,693**
Total personnel required – WB-TDM	11,571	59,747	1,602	242,178	126,591	**441,689**
Total personnel - actual	**6,416**	**58,274**	**1,101**	**269,640**	**131,684**	**467,115**

The proposed school network reorganization, if carried out fully, would reduce the total number of schools nationwide from 29,466 to 12,346 all of which could be adequately staffed. The number of teachers needed to adequately staff these schools would be about 418,000 compared to nearly 543,000 before the reorganization (Tables 4.4 and 4.2). The economies of scale resulting from the school network reorganization and the appropriate redistribution of existing teachers and school managers could eliminate the severe teacher shortages currently plaguing the majority of Thai schools. With the proposed reorganization, the existing 467,115 educational personnel within the Thai school system is more than adequate and any necessary reductions amongst existing staff could very likely be handled through normal processes since about 15,000 teachers, on average, will be retiring or otherwise leaving the profession each year over the next six years.

This section provides evidence that the current personnel allocation formulae used by TEPC does not provide all schools with adequate teachers and adversely affects small schools and the most socially vulnerable children enrolled in them. This report proposes the Teacher Demand Model as a suitable alternative in order to ensure that every classroom is adequately staffed by

appropriate specialist teachers, who are tasked with no more than 20 hours of teaching load per week. In effect, the model is fair both to students and teachers across all types of schools.

The recommendations in this section concerning an alternative methodology for allocating teachers to schools are motivated by the significant inequalities in the distribution of key educational personnel. The discussion so far has focused on the challenges of the current situation and the options for defining a different arrangement. It should be noted, however, that the proposed reorganization of the school network is a necessary prerequisite to implementing the alternative personnel allocation formula, as it would be totally unrealistic to expect the Ministry of Education to be willing or be able to expand the educational workforce by as much as 24 percent as required. The following sections now discuss additional mechanisms which might be deployed so as to move from the current scenario to the more equitable future alternative arrangements.

Annex 4.1: TEPC Educational Personnel Allocation Rules

Type 1: Schools with 120 or less enrolled students, with Preschool-Primary 6 or Primary 1-Primary 6 grades

Management and teaching staff:

- 1 to 20 students	1 principal	1 teacher
- 21 to 40 students	1 principal	2 teachers
- 41 to 60 students	1 principal	3 teachers
- 61 to 80 students	1 principal	4 teachers
- 81 to 100 students	1 principal	5 teachers
- 101 to 120 students	1 principal	6 teachers

Type 2: Schools with more than 120 enrolled students, with Preschool-Primary 6 or Primary 1-Primary 6 grades

Teaching staff:

- Pre-primary level	Pupil-teacher ratio = 25:1 Class size = 30
- Primary level	Pupil-teacher ratio = 25:1 Class size = 40

$$\#Teaching\ staff = \frac{(\#Classes^{Presch} \times Class\ size^{Presch}) + \#Students^{Presch}}{2 \times Pupil{:}\ teacher\ ratio^{Presch}}$$

Type 3: Schools with 120 or less enrolled students, with Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades

Teaching staff:

- Secondary level	Pupil-teacher ratio = 20:1 Class size = 40

#Teaching staff allocation for pre-primary and primary levels same as for Type 1 schools

$$\#Teaching\ staff^{Sec} = \frac{(\#Classes^{Sec} \times Class\ size^{Sec})}{Pupil{:}\ teacher\ ratio^{Sec}} = 2 \times \#Classes^{Sec}$$

Type 4: Schools with more than 120 enrolled students, with Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades

Teaching staff:

- Pre-primary level	Pupil-teacher ratio = 25:1 Class size = 30
- Primary level	Pupil-teacher ratio = 25:1 Class size = 40
- Secondary level	Pupil-teacher ratio = 20:1 Class size = 40

$$\#Teaching\ staff\ = \frac{(\#Classes^{Presch} \times Class\ size^{Presch}) + \#Students^{Presch}}{2 \times Pupil{:}\ teacher\ ratio^{Presch}} + \frac{(\#Classes^{Pri} \times Class\ size^{Pri}) + \#Students^{Pri}}{2 \times Pupil{:}\ teacher\ ratio^{Pri}} + (2 \times \#Classes^{Sec})$$

Type 5: Secondary schools

Teaching staff:

- Secondary level	Pupil-teacher ratio = 20:1 Class size = 40

$$\#Teaching\ staff^{Sec} = \frac{(\#Classes^{Sec} \times Class\ size^{Sec})}{Pupil{:}\ teacher\ ratio^{Sec}} = 2 \times \#Classes^{Sec}$$

Criteria for school management staff allocation for schools with more than 120 enrolled students

Management staff:

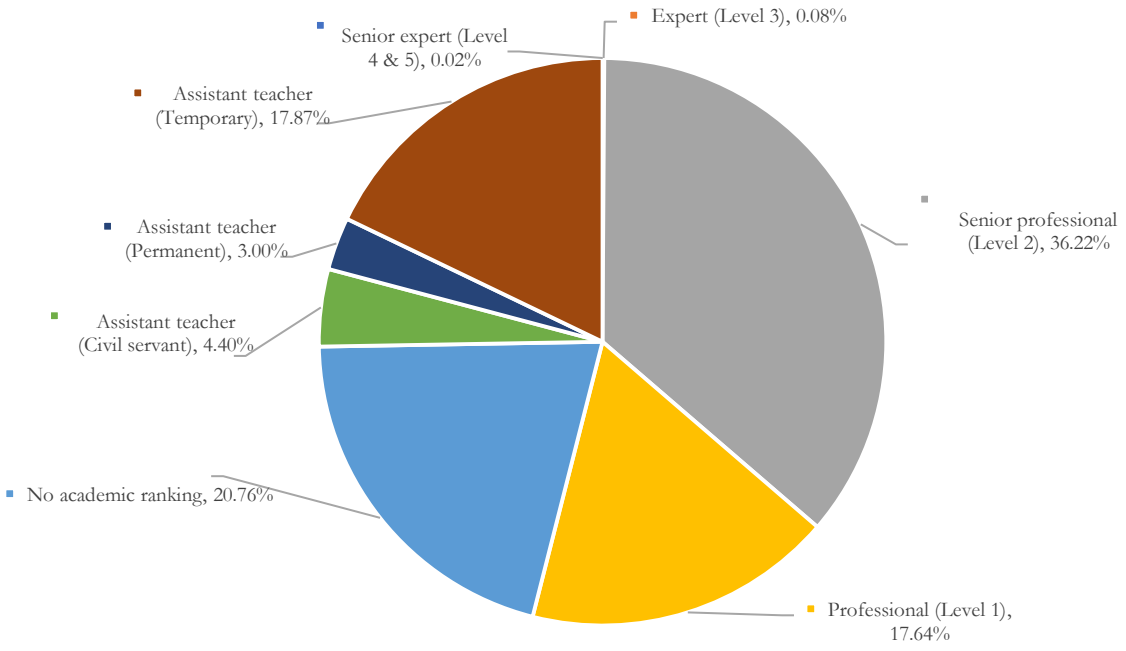
- 121 to 359 students	1 principal	
- 360 to 719 students	1 principal	1 deputy principal
- 720 to 1079 students	1 principal	2 deputy principals
- 1080 to 1679 students	1 principal	3 deputy principals
- 1680 or more	1 principal	4 deputy principals

Source: Office of the Teacher Civil Service and Educational Personnel Commission (OTEPC)

4.2. Providing Incentives for the Equitable Distribution of Educational Personnel

Another challenge with the allocation of educational personnel based on headcount alone is that higher-qualified and experienced (and hence more expensive) teachers and school managers are seen to gravitate towards larger urban schools. The existing centralized teacher deployment process allows teachers to be redeployed to any location of their own choosing once they have been in service for over two years (provided there is an available teaching position). Furthermore, the system does not provide any incentive to educational personnel to work in schools in remote areas. As was seen in Chapter 2, the lack of incentive has resulted in a disproportionately large share of less qualified teachers with few years of experience in small remote schools. In particular, we showed in Section 2.2 that teachers and school principals in the "Disadvantaged schools" are much less qualified, both in terms of educational qualification and academic ranking than teachers in the "Advantaged schools." Around 25 percent of teaching personnel in the Thai public school system hold the position of "Assistant teachers" (see Figure 4.1). These teachers have the least teaching experience and no academic ranking. Furthermore, nearly 71 percent of them are classified as "Temporary employees." The inequity in teacher qualification allocation is clearly reflected in the fact that almost 39 percent of teachers in the Disadvantaged schools are "Assistant teachers" compared to only 9.6 percent in the Advantaged schools (Section 2.2).

Figure 4.1. Share of Teaching Staff by Academic Ranking - 2019



Source: Office of the Basic Education Commission (2019)

A more equitable distribution of personnel qualification across schools is desired in future allocation arrangements. This can be achieved if either a greater share of the higher-qualified and experienced personnel can be assigned to rural schools, or if a system can be designed to provide the right incentives for them to choose to move to such schools.

The financing option considered in this chapter, that is, the funding of current expenditure of schools based on the number of students they have enrolled rather than on the inputs they employ, can be designed to alleviate this personnel qualification distribution inequality. A well-designed per-student funding formula for current expenditure, including personnel salary, has the potential to incentivize school administrators to manage key resources, especially teachers, more efficiently. In Thailand's highly centralized public school personnel management system, the salaries of educational personnel are paid directly by the central government and not through the school account. From a school's perspective, these personnel are free resources and schools have little flexibility in managing this key input. A basic per-student funding formula, which properly takes into consideration the number of personnel required in each school, while applying the same national average wage rates for teachers and school managers across all schools is likely going to be a more efficient and equitable option.[26]

If the education budget remains fixed, distributing funding differently will inevitably mean there are some schools which receive less money as others receive more. The schools that would be most affected are those which have higher proportions of high-ranking personnel. In general, this means large urban schools with much greater concentration of experienced and high-ranking personnel as their salaries are much higher than those of the personnel likely found in small remote schools (see Table 4.5). From public policy perspective, it is only desirable that all schools, regardless of the socioeconomic background of the student body, should be allocated adequate number of personnel with comparable composition of qualification and experience. This more equitable allocation can be achieved through market mechanism if the personnel salary allocations for all schools are calculated based on the adequate number of personnel (determined using the proposed teacher demand model) and the national average wage rates for teachers and school managers. Even though large urban schools will necessarily see their funding reduced by this approach, they are in a much better position than the small rural schools to raise additional resources from wealthier parents in order to maintain their above average personnel quality composition. The rural schools, on the other hand, will be endowed with more resources to attract higher-quality personnel.[27]

[26] The significant shift described here is from staffing to students as the basis for allocating resources. It should be noted that other countries which use a funding formula based on students do not treat all students the same. For example, pupils with special educational needs require higher per capital allocations as do secondary education students as against primary education students. Any formula developed for Thailand would need to consider such adjustments. These issues are considered further in section 4.5 below.

[27] World Bank (2018) states that "Parents and communities contribute between 20 and 30 percent of the total per student expenditure in public schools (UNESCO 2009) and another 10 percent is donated by the private sector (for which there are generous tax incentives)." With their greater number of wealthier students, it can be expected that the large urban schools are in a much better position to raise additional funds from parents compared to the small rural schools. Moreover, any new funding mechanism would need to build in transition arrangements so that an individual school's budget would not change too dramatically from one year to the next.

Table 4.5. Base Salary and Other Allowances of Educational Personnel (Thai Baht)

	Base salary reference rate	Academic ranking allowance	Special allowance	Total monthly salary
Senior expert (Level 5)	64,695	15,600	15,600	95,895
Senior expert (Level 4)	54,975	13,000	13,000	80,975
Expert (Level 3)	43,265	9,900	9,900	63,065
Senior professional (Level 2)	32,735	5,600	5,600	43,935
Professional (Level 1)	26,190	3,500		29,690
No academic ranking	26,190			26,190
Assistant teacher (Civil servant)	22,330			22,330
Assistant teacher (Permanent)	17,480			17,480
Assistant teacher (Temporary)	15,050			15,050

Source: Ministry of Education, Thailand

Furthermore, options for providing stronger incentives to attract quality teachers to small remote schools could be explored. At the moment, the same standard salary scales are applied across all geographical areas of the country, regardless of specific characteristics of the areas such as transport inaccessibility or lack of basic infrastructure. This report recommends an introduction of a "Special Hardship Allowance" (SHA) component for educational personnel assigned to a hardship post. Box B.4.1 demonstrates a standardized approach to designing a School Hardship Index, which will serve as proxy for the hardship faced by personnel in schools located in difficult environments. This index would be used to determine the level of SHA associated with a posting location, with an objective to incentivize more highly qualified and experienced educational personnel to work in hardship areas and thus further promote equity.

Box B.4.1: School Hardship Index

The development of a School Hardship Index (SHI) is based on a regression analysis of the presence of more highly qualified and experienced teachers as a function of various characteristics of the environment where the schools are located. The dataset used to construct the SHI comes from the Community Development Department, the Ministry of Interior. The 2019 National Rural Development dataset (NRD 2019) is the latest village level dataset which collects economic and social development information from all 70,440 rural villages across Thailand. The study has been carried out every other year since 1988. For 2019, the number of households in all rural villages total 10.88 million, while the total population covered is 28.1 million.

The NRD 2019 compiles results from several hundred indicators into 33 indices covering 7 broad dimensions, namely: i) infrastructure quality; ii) economic development; iii) health and work safety; iv) education; v) social cohesion; vi) natural resources and environment; and vii) hazards from crime and natural disasters. Each index is given a score of 1 (highly problematic), 2 (moderately problematic), or 3 (lowly problematic/no problem). Missing values are assigned a score of zero.

The Model

An econometric analysis is conducted at the district level to identify factors associated with the concentration of teachers with senior professional ranking or higher. At the national level, 36.3 percent of teachers were in this qualification category in 2019 (Figure 4.1). A subset of 13 NRD indices across the 7 dimensions are selected for the regression model. These are: i) *Infrastructure* – Road, Drinking water, Electricity, Communication; ii) *Economic development* – Farm production, Manufacturing production; iii) *Health and work safety* – Work safety, Communicable disease prevention, Sport and exercise; iv) *Education* – Educational attainment of the population; v) *Social cohesion* – Social integration; vi) *Natural resources and environment* – Environmental management; and vii) *Hazards from crime and natural disasters* – Absence of hazards from drugs/drug-related crimes.

It should be noted that many of the selected regressors, especially those which are grouped within the same dimensional domain, are positively correlated. Principal components analysis (PCA) is employed to deal with this multi-collinearity problem. For example, PCA is used to construct a single index of Infrastructure quality (the first principal component) from the original four indices. On the whole, the technique enables a reduction of total regressors from 13 to just 7 in the baseline model. The resulting regression model thus has the following specification:

$$Share\ of\ senior\ professional\ or\ higher^j = \beta_0 + \beta_1 Infrastructure^j + \beta_2 Econonomic^j + \beta_3 Health^j + \beta_4 Education^j + \beta_5 Social\ Cohesion^j + \beta_6 Environment^j + \beta_7 Hazards^j + u$$

where j denotes a district, and the 7 district level development indices are population-weighted averages of the village level indices within the same district. Summary statistics of the dependent variable and the 7 indices are presented in Table B.4.1.

Table B.4.1. Descriptive Statistics of Regression Variables

	Mean*	SD	Min	Max
Share of senior professional teachers or higher	33.908	14.898	0.000	76.107
Infrastructure quality	0.000	1.348	-10.546	3.030
Economic development	0.000	1.052	-1.094	13.788
Health and work safety	0.000	1.117	-7.851	1.415
Educational attainment of the population	2.661	0.304	1.000	3.000
Social cohesion	2.233	0.428	1.000	3.000
Environmental management	2.846	0.161	1.804	3.000
Absence of hazards from drugs/drug-related crime	2.622	0.267	1.680	3.000

Source: Community Development Department, the Ministry of Interior (2019)
*Note: *District level simple means*

The parameter estimation is done using random effects panel data regression, where the panels are the 76 provinces (excluding Bangkok since there is no rural district in the city) and the outcomes are the district level shares of teachers with senior professional ranking or higher. The resulting baseline model regression estimates are presented in the first column of Table B.4.2.

We can see from the R-squared coefficient that the 7 development indices explain only 21.4 percent of the total variation in the shares of highly qualified teachers across 877 rural districts. Nevertheless,

three indices appear statistically significant in predicting the shares. These are Infrastructure quality, Economic development, and Social cohesion. Although Educational attainment of the population does not enter the model significantly under a two-tailed test of significance, the variable is statistically significant at the 10 percent level under a one-tailed test. All regression coefficients, except for Environmental management (which is not statistically significant with a p-value of 0.825), have the expected signs.

The Final model shown in column 2 of Table B.4.2 discards the variables which do not have statistically significant association with the dependent variable. It can be seen that the R-squared coefficient of the Final model declines only slightly to 0.206.

Table B.4.2. Random Effects Panel Data Regression of District-Level Shares of Teachers with Senior Professional Ranking or Higher

	Baseline Coef.	Final Coef.
Infrastructure quality	0.816***	0.875***
	(0.287)	(0.268)
Economic development	1.605***	1.587***
	(0.378)	(0.376)
Health and work safety	0.213	
	(0.306)	
Educational attainment of the population	1.609	1.665
	(1.138)	(1.132)
Social cohesion	1.978**	1.964**
	(0.965)	(0.957)
Environmental management	-0.497	
	(2.245)	
Absence from hazards from drugs/drug-related crime	0.958	
	(1.432)	
Intercept	22.906***	23.864***
	(7.687)	(3.683)
Observations - districts	877	877
Observations - provinces	76	76
Overall R-squared	0.214	0.206
Between cluster standard deviation σ_u	6.280	6.376
Within cluster standard deviation σ_e	8.332	8.325
Intra-cluster correlation coefficient ρ	0.362	0.370

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The School Hardship Index is constructed directly from the estimated regression coefficients from the Final Model. Particularly, a hypothetical district with the maximum value on each regressor would get the lowest Hardship Index score of 1:

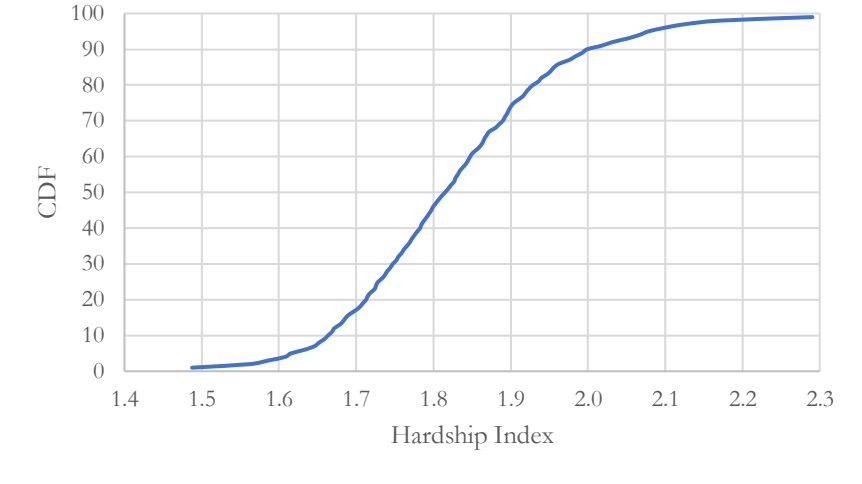
$$Hardship\ Index^{Max} = \frac{X^{Max}\hat{\beta}}{X^{Max}\hat{\beta}} = 1$$

where X^{Max} is a vector of regressors with maximum values observed among all districts. The Hardship Index for another district j is then calculated as follows:

$$Hardship\ Index^{j} = \frac{X^{Max}\hat{\beta}}{X^{j}\hat{\beta}} \geq 1$$

which is a measure of how "deterring" district j is relative to the "best" hypothetical district. The resulting cumulative distribution function (CDF) for the Hardship Index for all 877 rural districts is presented in Figure B.4.1. The average Hardship Index score and its standard deviation are 1.826 and 0.151 respectively (the index score ranges from 1.051 to 2.897).

Figure B.4.1. Cumulative Distribution Function of the School Hardship Index



Special Hardship Allowance

The Special Hardship Allowance (SHA) is determined based on a school's Hardship Index score. In principle, the SHA can be allocated as a percentage of the educational staff's salary. Since the SHA is designed to compensate for hardship faced by teachers in a specific district, all educational personnel in a given district, being exposed to the same environment, could receive the same percentage of the SHA. Alternatively, another condition could be imposed so that only those personnel whose origin of residence is outside of their posting location are qualified for the SHA.

The sizes of the SHA's could be determined using Hardship Index thresholds. For example, from Figure B.4.1, we can see that 25 percent of the rural districts have an index score of less than 1.728 and that half of the rural districts have index scores less than 1.815. A policy could be set so that a posting location with a Hardship Index score ≥ 1.728 and < 1.815 could receive a SHA of 10 percent. Similarly, for posting locations with Hardship Index scores of ≥ 1.815 and < 1.904 (75th percentile), educational personnel could receive a SHA of 20 percent. For posting locations with Hardship Index scores of ≥ 1.904, the SHA could be set at 30 percent. The appropriate thresholds

and the sizes of the SHA's are policy parameters which must be determined empirically.[28] Posting locations in urban areas are assumed to have Hardship Index scores of less than 1.728 and thus personnel posted to these urban locations would not receive any SHA.

There is also an issue of differences in the cost of living across provinces in Thailand, which should be reflected in the funding formula. This report recommends that the wage rates of the educational personnel be adjusted for differences in the cost of living. This can be easily carried out given that provincial consumer price indices are regularly updated by the Ministry of Commerce.

4.3. Support for Underprivileged Students

In order to reduce educational inequality and improve access of underprivileged students to basic education, the government has started providing additional per-head subsidies for poor (and very poor) students beginning in the 2008 academic year. The annual per-student subsidies amount to THB 1,000 and THB 3,000 for primary and lower secondary level respectively. In the 2019 academic year, given the 1.178 million poor primary and 430,751 poor lower secondary students (see Table 4.5), the total underprivileged subsidy would have amounted to THB 2.47 billion. However, due to inadequate budget, a ceiling has been established so that each school can only receive the per-student subsidy for a maximum of 40 and 30 percent of the total primary and lower secondary students enrolled in the school respectively.

Table 4.5. Number of Students in OBEC Schools by Socioeconomic Status – 2019

	Preschool	Primary	Lower secondary	Upper secondary	Total
Non-poor	865,446	1,905,236	1,257,158	937,710	4,965,550
Poor	12,744	670,193	259,355	0	942,292
Very poor	20,397	507,915	171,396	0	699,708
Total	898,587	3,083,344	1,687,909	937,710	6,607,550
Poor & very poor share	3.69%	38.21%	25.52%	0.00%	24.85%

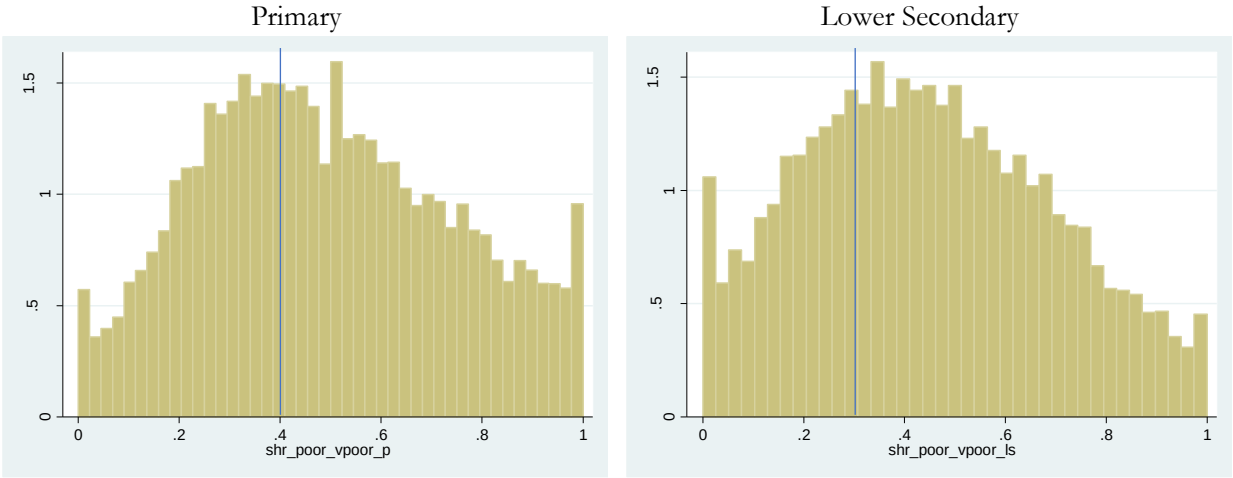
Source: OBEC (2019) student-level data

The budget rationing in 2019 disproportionately affected schools with large numbers of poor students. From Table 4.5, we can see that the total shares of poor and very poor students are 38.2 and 25.5 percent for primary and lower secondary level respectively, which are below the 40 and 30 percent ceilings. However, from the analysis given in Section 2.2 we have seen that the poor students are mostly concentrated in the small Disadvantaged schools. As a result, the underprivileged subsidy for as many as 60.5 percent of schools with primary grades and 69.3 percent of schools with lower secondary grades were rationed in 2019 (Figure 4.2).[29] The rationing process, therefore, means that only THB 1.38 billion instead of THB 2.47 billion (or 56 percent) was allocated to schools.

[28] The determination of the thresholds and the sizes of the SHA's is beyond the scope of this chapter.

[29] The density of schools with more than 40 percent poor primary students is represented by the area of the histogram of density to the right of the vertical line which crosses the horizontal axis at 0.4 in the "Primary" chart in Figure 4.2. This

Figure 4.2. Distributions of the School-Level Shares of Poor Students - 2019



Source: World Bank staff estimates based on OBEC (2019) school- and student-level data

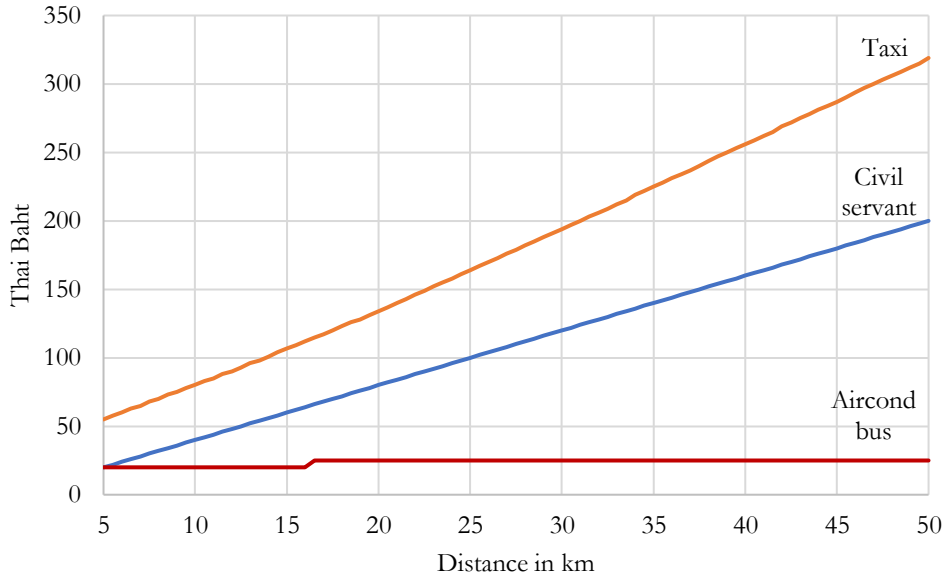
The analysis in this section shows that the underprivileged subsidy rationing process has once again put small schools with high concentration of poor students at a distinct disadvantage. To address this inequitable allocation of the underprivileged subsidy, this report recommends that the ceiling system be abolished altogether and that each school be allocated the underprivileged subsidy provision based solely on the number of poor students enrolled in the school. Should there be insufficient budget in any given year, it is recommended that the rationing process be done on a pro rata basis. Consider the 2019 academic year for example. For that year, OBEC schools should have been allocated THB 2.47 billion for the underprivileged subsidy provision, absent the rationing. However, only THB 1.38 billion or 56 percent of the amount was disbursed. Rather than applying the ceiling approach, the rationing could have been done more equitably through a 44 percent reduction in the per-student rates to THB 560 and THB 1,680 for all poor primary and poor lower secondary students respectively, and ensuring that this funding was provided for all eligible students.

4.4. Transportation Subsidy for Students

The existing per-student allocations have no transportation subsidy component for students. This section explores the option for subsidizing student transportation to schools based on standard taxi fare, civil servant reimbursement rate per business kilometer driven, and public air conditioned bus fare (Figure 4.3). Armed with information on the locations of students' residences and their schools, we are able to estimate the total amount of transportation grant required using these three different rates.

area to the right of the vertical line represents 60.5 percent of the total area of the histogram. Similarly, the area to the right of the vertical line in the "Lower Secondary" chart represents the 69.3 percent share of schools with more than 30 percent poor lower secondary students.

Figure 4.3. Standard Rates According to Travel Distance by Mode of Transport



The transportation subsidy simulation in this section assumes that the school network has been fully reorganized, using the parameters and assumptions described in Chapter 3, and that each student would attend the school closest to his/her place of residence.[30] Furthermore, it is assumed that students living within 5 km from their nearest schools would not be eligible for the transportation subsidy, nor would students attending secondary schools (Type 5) since these schools are not included in the school network reorganization plan. The maximum amount of subsidy is capped for travel distances from home to school of no more than 50 km.[31] The amount of transportation subsidy is calculated based on a 200-day academic year and 2 trips per day.

Out of the 4.49 million students enrolled in OBEC schools (excluding Type 5 schools), 3.49 million would live within 5 km from their designated schools and would not be eligible to receive the transportation support. There would be 911,405 students living between 5 and 50 km (average distance of 10.5 km) from their designated schools and would be eligible to receive the transportation subsidy. The remaining 92,765 students are assumed to become boarding students and their annual boarding subsidy would amount to around THB 2.88 billion. The annual transportation subsidy calculated for the three rates are as follows:

- **Standard taxi fare**: The annual per-student subsidies would average THB 33,570 and range from THB 22,000 to THB 127,600. Under this scenario, the total transportation subsidy would amount to THB 30.60 billion per year

[30] To repeat: policy makers can adjust the assumptions, leading to different options for network reorganization.
[31] Students who live more than 50 km away from their schools have the option to either receive the ceiling transportation subsidy or become a boarding student and receive a per-student boarding subsidy. However, we assume in the simulation that all students who reside more than 50 km away from their designated schools would choose to become boarding students. The per annum amount of per-student boarding subsidy is THB 30,600 for preschool, THB 30,800 for primary, THB 32,200 for lower secondary, and THB 32,500 for upper secondary student respectively. These per-student boarding subsidy rates are the rates currently being used in OBEC's Welfare schools.

- **Civil servant reimbursement rate (THB 4 per km)**: The annual per-student subsidies would average THB 16,810 and range from THB 8,000 to THB 80,000. Under this scenario, the total transportation subsidy would amount to THB 15.32 billion per year
- **Air conditioned bus fare**: The annual per-student subsidies would average THB 8,274 and range from THB 8,000 to THB 10,000. Under this scenario, the total transportation subsidy would amount to THB 7.54 billion per year

It is interesting to note that if a transportation subsidy were to be introduced for the current school network, the total grant allocation would be even higher than that under the reorganization scenario. This is a direct consequence of the assumption that after the school network reorganization and the upgrading of all schools to attain the minimum standards (FSQL), each student would attend the school situated closest to his/her place of residence. To see this, consider the scenario under the status quo compared to reorganization scenario discussed in the preceding paragraph. Out of the 4.49 million students currently enrolled in OBEC schools (excluding Type 5 schools), 3.41 million are living within 5 km from their schools and would not be eligible to receive the transportation support. There are 992,188 students living between 5 and 50 km (average distance of 10.02 km) from their schools and would be eligible to receive the transportation subsidy. If the remaining 93,991 students were to become boarding students, their annual boarding subsidy would amount to around THB 2.91 billion. The annual transportation subsidy calculated for the three rates would be:

- **Standard taxi fare**: The annual per-student subsidies would average THB 32,550 and range from THB 22,000 to THB 127,600. Under this scenario, the total transportation subsidy would amount to THB 32.30 billion per year
- **Civil servant reimbursement rate (THB 4 per km)**: The annual per-student subsidies would average THB 16,033 and range from THB 8,000 to THB 80,000. Under this scenario, the total transportation subsidy would amount to THB 15.91 billion per year
- **Air conditioned bus fare**: The annual per-student subsidies would average THB 8,238 and range from THB 8,000 to THB 10,000. Under this scenario, the total transportation subsidy would amount to THB 8.17 billion per year

As of 2019 there are 34,304 students (279 preschool, 8,944 primary, 15,646 lower secondary, and 9,435 upper secondary) enrolled in OBEC's 51 Welfare schools and 31,619 of these students are boarding students. These Welfare schools are spread throughout the country and mainly serve the underprivileged[32] students from preschool to upper secondary levels. These schools are not included in the main analyses of this report. Therefore, it is important to note that none of the students analyzed in this report are boarding students, even those living more than 50 km from their schools.[33] The assumption that the 92,765 students would choose to become boarding students under the

[32] Such as the poor, orphaned or abandoned children, ethnic minorities, and children living in remote areas who have difficulty accessing schools.

[33] OBEC does not define a cut-off distance whereby a child is considered having schooling access difficulty. The 50 km cut-off distance chosen in this section is therefore arbitrary and is used only for simulating the transportation and the boarding subsidies.

reorganization scenario is thus likely to be much too high and the annual boarding subsidy of THB 2.88 billion is unlikely to be realized.

The transportation subsidy is one important instrument worth exploring, especially if the government seeks to gain popular support for the reorganization of the school network, where as many as 17,120 out of 29,466 schools will be closed down. In addition to the expectation that all remaining schools after the school network reorganization will be well equipped, adequately staffed, and physically attractive, the introduction of the transportation subsidy could further incentivize students, parents, and communities to support the long overdue reorganization.

4.5. Using Formula Funding for the Distribution of Current Expenditure to Schools

An investigation of international data by OECD (2016) finds that over 90 percent of annual expenditure by educational institutions is classified as recurrent. Furthermore, on average, as much as 77 percent of total current expenditure among OECD countries is used for staff compensation for both primary and secondary education in 2013. A detailed review of school funding policies on 18 school systems (referred to as "OECD review countries") conducted by OECD (2017) concludes that the use of formula funding is particularly suited for the distribution of current expenditure. Among the OECD review countries, the use of funding formulae to allocate funding for teacher salaries is prevalent, and in only a few cases are these not used.

Four main groups of variables typically form the building blocks of a funding formula (Levacic and Ross, 1999). These are: i) A basic allocation based on student number and grade level; ii) An allocation for curriculum enhancement; iii) An allocation for students with supplementary educational needs; and iv) An allocation for specific needs related to school site/location. Detailed explanations of the four components are given in OECD (2017) and Levacic and Ross (1999) and are reproduced in Annex 4.4 for readers' convenience. Also presented in Annex 4.5 is Table A.4.5, which provides an overview of the extent to which OECD review countries include weightings for these different components in their funding formulae.

The use of formula funding provides a high degree of transparency, and if well designed, can promote greater equity and efficiency (OECD, 2017). However, the main challenge lies in estimating the coefficients of the formulae, which adequately reflect the different per-student costs associated with providing different types of education in different schooling environments to students with diverse needs. This is especially difficult in education systems where there is great variation in school and class sizes such as in Thailand.

In accordance with the directives provided by the 1999 National Education Act (amended in 2002), Thailand started to gradually decentralize educational administration to Educational Service Areas (ESAs), educational institutions, and local administration organizations (Lathapipat and Sondergaard, 2015). Even though educational personnel management remains highly centralized, teachers and institutions are allowed more freedom to set curricula and mobilize resources for the provision of education. Since 2002, Thailand began to shift away from "line-item budgeting" by introducing per-student allocation for schools' operational costs (excluding personnel salary). This marks an important turning point as more discretion is given to schools over the use of

the funds to better meet local needs. Currently, the basic allocation component distributed to all public schools based on a per-student basis includes subsidies for tuition, textbooks, school uniforms, learning materials, and student improvement activities. The formula differentiates the amounts allocated per student according to the stage of schooling and/or grade level as shown in Tables 4.6 and 4.7.

Table 4.6. Annual Per-Student Subsidy for Basic Education Provision (THB) – FY2018

Fee type receiving financial support	Pre-primary	Primary	Lower secondary	Upper secondary
Tuition	1,700	1,900	3,500	3,800
Text book	Text book subsidy is different for each grade as shown in Table 4.7			
School uniform	300	360	450	500
Learning materials	200	390	420	460
Student improvement activity	430	480	880	950
Subsidy for underprivileged students	-	1,000	3,000	-
Per-student subsidy for small schools	500	500	1,000	1,000
Per-student subsidy for Opportunity Expansion schools	-	-	1,000	-

Source: Office of the Basic Education Commission (2018)

Table 4.7. Annual Per-Student Subsidy for Textbooks by Grade Level (THB) – FY 2018

Grade	Pre-pri	Pri 1	Pri 2	Pri 3	Pri 4	Pri 5	Pri 6
Amount	200	625	619	622	673	806	818

Grade	Sec 1	Sec 2	Sec 3	Sec 4	Sec 5	Sec 6
Amount	764	877	949	1,318	1,263	1,109

Source: Office of the Basic Education Commission (2018)

In addition to the basic allocation component, there is a needs-based component for underprivileged students, and specific allocations for small and Opportunity Expansion schools (School Types 1, 3, and 4). The shortcomings of the present needs-based allocation mechanism for underprivileged students were discussed in Section 4.3. Regarding the specific allocation for small schools, the main purpose for the allocation is to compensate these schools for their significantly smaller class sizes. As shown in Section 4.1, in order to provide adequate education quality, the WB Teacher Demand model estimates that these small schools (Type 1 and Type 3) would need 80,000 additional teachers and school managers, whose total salary would exceed THB 30 billion per year. However, the total small-school subsidy amounts to less than THB 500 million annually, which is far from sufficient to compensate for the schools' lack of scale economies and the highly

inadequate staff entitlement allocation. Similarly, most Opportunity Expansion schools (Type 3 and 4)[34] are much smaller than a typical secondary school and are more severely understaffed. The total small school and Opportunity Expansion school subsidies fall far short of the amount needed to hire additional personnel to adequately staff these schools (see Table 4.8).

Table 4.8. Estimated Total Small and Opportunity Expansion School Subsidies and Annual Salary of Additional Educational Personnel Required – 2019

School Type	Type 1	Type 3	Type 4	All
Number of schools	13,805	859	6,153	20,817
Number of students	888,100	76,726	1,770,888	2,735,714
Small school subsidy (million THB)	444	49	-	493
Opportunity Expansion school subsidy (million THB)	-	22	476	498
Total subsidy (million THB)	**444**	**71**	**476**	**991**
Additional personnel needed (persons)	74,873	5,127	19,777	99,777
Annual salary of additional personnel (million THB)	**28,390**	**1,944**	**7,499**	**37,833**

Note: Additional personnel required is estimated using the WB-Teacher Demand Model

The Thai government also provides per-student funding for specific and special education, as well as for boarding subsidy for students who have difficulty accessing their schools. Different per-student subsidies are provided to public schools focused on arts, sports, science, or different vocational fields, as well as to schools serving students with disability. Students with schooling access difficulties also receive extra per-student allocation for boarding. Nonetheless, analyses of the adequacy of these subsidies are beyond the scope of this report.

Another important area to improve schooling quality is through professional development for teaching and management staff. For systems which employ the use of formula to allocate funding for educational personnel salaries, it could be useful to earmark a certain percentage of the salary grant for professional development, or to set strong expectations that this proportion is spent on professional development or to give each teacher a personal allowance for professional development (Santiago et al., 2016). On this front, Thailand has implemented a major reform in 2017. In particular, the government has dismantled top-down centralized directives and instead provided a THB 10,000 coupon directly to teachers (OECD, 2018). The coupon enables them to enroll in courses organized under the scheme by OBEC that best suit their needs.[35] All civil servant teaching personnel are eligible for the coupon.

Schools are responsible for preparing their own school development plans for managing non-salary resources and for submitting school plans to the ESA for approval of capital

[34] The "Educational Opportunity Expansion School" program was initiated to help fulfill the government's commitment to providing secondary education for all. However, apart from adding additional grades, little was done to ensure that these former primary schools could provide a quality secondary school education. These rural schools are generally understaffed and are inadequately endowed with material resources (science laboratory equipment, library materials, instructional materials, etc.) and physical infrastructure (Lathapipat and Sondergaard, 2015).

[35] The training courses are provided by universities and private providers. Educational Service Area Offices nationwide adopt the courses for teachers in their area. The courses cover core subjects such as Thai, English, science and mathematics. They are aimed at helping teachers develop their skills to be on par with international standards (Bangkok Post, 23 August 2017).

expenditures funded by the central government. The capital budget is negotiated by the ESA and OBEC based on school need (whether there are specific criteria and agreed modality for priority setting was not verified). The capital budget is transferred to the ESA who manage allocation to schools, but schools are responsible for implementing capital programs. Schools indicated that this system was functioning well (World Bank, 2018).

Annex 4.4: The Four Building Blocks of a Funding Formula

There are four main components which are the building blocks of a formula. Each component relates to a main purpose for allocating funds to schools. Different weightings assigned to each of the major components below will be crucial in balancing the relative importance of the different policy functions for a funding formula (market regulation; promoting equity; directive function).

A basic allocation: This could be an allocation per student or per class. If the unit is class, then the formula will include assumptions about the maximum permitted class size before an extra student demands the forming of two classes. There would be a year-level supplement differentiated according to the school year (grade level) or stage of schooling (e.g. primary, lower secondary, etc.). Setting a fixed amount per student in a particular year uses the assumption of the costs of educating a student with normal educational needs. This requires an analysis of expenditure requirements, e.g. activity-led costing. This –particularly with a per student unit – strongly supports the market regulation function.

An allocation for curriculum enhancement: This component would adjust for the costs of providing a specific educational profile and would only apply to selected schools or students. For example, this could be the offer of a specialized curriculum such as a focus on the arts, sports or different vocational fields. It could also be the offer of an adjusted curriculum designed to meet specific educational needs of the school's student group. This allocation can support the directive function, helping to promote areas of the curriculum favored by policy makers.

An allocation for students with supplementary educational needs: This would aim to adjust for different student characteristics which would require additional resources to ensure the same level of access to the required curriculum. This allocation plays a major role in supporting the equity function.

An allocation for specific needs related to school site/location: This would aim to adjust for structural differences in school site operation costs that are generally beyond the school management's control, e.g. schools located in rural or remote areas with significantly lower class sizes, schools with higher maintenance costs (linked to local economic factors and/or specialized equipment needs). School size is an important determinant of unit cost. Fixed costs (e.g. school leadership, premises, providing a selection of subjects) do not diminish with the number of students. Here it is key to define the "minimum efficient size" which represents the minimum size of a school at which average cost per student approaches its lowest feasible value. This involves a judgement about the extent to which small schools should be supported by additional allocations. This allocation can support the equity and directive functions

Source: Levacic and Ross (1999) as cited in OECD (2017)

Table A.4.5. Funding Formulas: Different Criteria Used for Allocation of Current Expenditure Among OECD Review Countries (ISCED 1-3), 2016

Allocation mechanism		Funding allocation		Level of education (ISCED)			School characteristics				Curriculum					Student characteristics			
	Purpose	From	To				L	S	SES	Other	Lvl	SY	EdT	Pg	WbP	SES	SEN	Min/ Imm	Other
Austria	Teacher salaries	CA	Staff		2	3													
	Teaching students with SEN	CA	Sc	1	2	3				x							x		
Belgium	Operational budget (incl. maintenance staff)	SA	SP	1	2	3	x	x			x	x	x	x	x	x	x		
	Disadvantages students: immigrants; refugees	SA	SP	1	2	3	x				x	x		x		x	x		
	Staff salaries (teachers, management, admin)	SA	Staff	1	2	3	x	x			x	x	x	x	x	x	x		
Chile	General and pro-retention subsidies	CA	SP	1	2	3	x				x		x			x			
	Complement for teacher salaries	CA	SP	1	2	3	x		x										
	Students with SEN: disadvantages students	CA	SP	1	2	3			x	x	x								
	Staff salary incentives in top performing schools	CA	SP	1	2	3				x									
Czech Republic	Direct costs of school education	CA	RA	1	2	3						x	x						
	Direct costs (incl. salaries)	RA	Sc	1	2	3	x	x		x	x	x	x	x			x		
Denmark	For current expenditure	CA	Sc			3					x	x		x					
Estonia	General education (incl. salaries)	CA	SP	1	2	3	x	x					x				x		
	Policy priorities (special provision)	CA	SP	1	2	3								x		x		x	
	Schools owned by CA	CA	Sc	1	2	3	x	x					x				x		
	State commissioned VET study place	CA	LA		2	3								x			x		
	Study allowances (VET) to 3 municipalities	CA	LA		2	3						x		x					
Iceland	Any type of expenditure	CA	Sc			3	x	x					x	x			x		
	Equalize differences in LA income/expenditure needs	CA	LA	1	2												x	x	
Israel	Non-teacher salaries and operational costs	CA	LA	1	2	3		x			x						x		
	Teacher salaries	CA	LA			3				x						x	x		
	Teacher salaries	CA	Staff	1	2		x				x					x	x		

Table A.4.5. Funding Formulas: Different Criteria Used for Allocation of Current Expenditure Among OECD Review Countries (ISCED 1-3), 2016 (continued)

	Allocation mechanism	Funding allocation		Level of education (ISCED)			School characteristics				Curriculum					Student characteristics			
	Purpose	From	To				L	S	SES	Other	Lvl	SY	EdT	Pg	WbP	SES	SEN	Min/ Imm	Other
Lithuania	Teaching and operational costs	CA	LA/Sc	1	2	3	x	x			x		x	x			x	x	
Slovak Republic	Salaries (form one BG with operational costs)	CA	SP	1	2			x		x	x		x	x					
	Salaries (form one BG with operational costs)	CA	SP			3				x			x	x	x				
	Operational costs (forms one BG with salaries)	CA	SP	1	2			x		x			x						
	Operational costs (forms one BG with salaries)	CA	SP			3				x			x	x					
	Socially disadvantaged students	CA	LA	1	2											x			
	Student competitions/international projects	CA	SP	1	2	3				x									
Slovenia	Any type of expenditure (except SEN/school meals)	CA	Sc			3							x						
	Students with SEN; School meals	CA	Sc			3										x	x		
	Operating costs of the educational program	CA	Sc	1	2		x										x	x	
Spain	Staff salaries; Teacher professional development	RA	Staff	1	2	3													x
	Supporting students with SEN	RA	Sc	1	2	3											x		
	Operating costs/maintenance	RA	Sc		2	3	x	x			x			x			x	x	
Denmark*	For current expenditure	LA	Sc	1	2			x	x							x			
Iceland*	Salaries/operating costs; Support for specific students	LA	Sc	1	2		x	x		x				x			x		
Sweden*	Typically for any type of expenditure	LA	Sc	1	2	3													x

Notes: Funding allocation: CA = central authorities; SA = state authorities; RA = regional authorities; LA = local authorities; SP = school providers; Sc = schools;
School characteristics: L = location; S = size; SES = socio-economic status
Curriculum: Lvl = level of education; SY = school year; EdT = type of education; Pg = program; WbP = work-based placement
Student characteristics: SES = socio-economic status; SEN = special educational needs; Imm = immigrant background; Min = minority
Source: OECD (2017)

4.6. Public Spending Simulations Based on the Status Quo and on the Planned School Network Reorganization

If Thailand is to adopt formula funding for the distribution of most current expenditure to its schools in the future, the country must recognize the three major shortcomings of the current system of educational resource allocation mentioned above. First and foremost, the current practice in determining staffing entitlement for a Thai public school, calculated using the TEPC formulae for the five school types (see Annex 4.1), is seriously flawed. It is shown in Section 4.1 that the TEPC personnel allocation methods are causing severe teacher shortages, especially among small rural schools. Second, there is a lack of mechanism to ensure a fairer and more even distribution of highly qualified and experienced personnel across schools. Third, the analysis in Section 4.3 shows that the underprivileged subsidy rationing process has put small schools with high concentration of poor students at a distinct disadvantage. The example from Thailand clearly indicates that transparent resource allocation formulae, if poorly designed, can have serious repercussions on equity and efficiency.

An alternative teacher demand model (see Annex 2.1) is proposed, which takes into consideration specific composition of education levels within a school, the number of students in each grade, teacher specialization, and teachers' maximum teaching load. The WB Teacher Demand Model is proposed as a single formula for determining schools' "adequate" teacher entitlement. By design, the model already takes into consideration the effect of school and class sizes as can be seen from the discussion in Section 4.1, as well as the greater teacher specialization required for secondary school stage. If the proposed formula is adopted, OBEC can discard the small school- and Opportunity Expansion school-subsidies, which were shown in the preceding section to be inadequate to compensate for the schools' lack of scale economies and the highly flawed TEPC staff entitlement criteria. When the WB Teacher Demand Model is linked with teachers' national average wage rate, the formula can be used to transparently and equitably determine the "basic allocation" to schools.[36]

We reiterate that the reorganization of the school network is a necessary prerequisite to implementing the proposed "basic allocation" formula. As was shown in Section 4.1, if the number of schools remains as is, 111,982 extra teachers and school managers would be needed to adequately staff all classrooms in OBEC schools. Personnel salary cost alone would increase by around THB 42 billion per year. However, if Thailand's vast school network is reorganized, the total number of educational personnel needed could decline over time from 579,007 to as little as 441,689, and the current educational workforce of 467,115 would be more than adequate.

The spending simulations conducted in this section will thus compare the scenario where the school network has been reorganized to the current scenario (status quo). Key assumptions used in the simulation exercise are: the current per-student underprivileged subsidies (without the rationing), the teacher professional development coupons of THB 10,000 per teacher per year, the per-student boarding subsidies, and the per-student subsidies for tuition, textbooks, school uniforms, learning materials, and student improvement activities are already adequate. The simulation, therefore,

[36] In this simulation exercise, the allocation of school managers (principals and deputy principles) is determined using the existing TEPC allocation rules (see Annex 4.1).

will focus only on the major current expenditure components which would be affected if the school network were to be reorganized.

The total cost saving over time from personnel expenditure as a result of the school network reorganization could amount to as high as THB 11.2 billion per annum. Table 4.9 presents the simulation results for personnel expenditure (basic allocation) under the scenario where the school network has been reorganized compared to the current situation. The annual cost saving from salary expenditure alone could amount to THB 11.2 billion. There would also be addition saving from teacher professional development in the amount of THB 105.3 million per year due to the smaller teaching force.

Table 4.9. Educational Personnel Expenditure Simulations

	Number of persons		Annual expenditure (million THB)		
	Status quo	Reorganized	Status quo	Reorganized	Saving (mil THB)
Educational personnel:					
Teachers	430,959	417,650	159,561.31	154,633.68	4,927.62
Principals	29,466	12,346	14,808.98	6,204.83	8,604.14
Deputy principals	6,690	11,693	3,250.83	5,681.91	(2,431.08)
Total educational personnel	467,115	441,689	177,621.12	166,520.43	11,100.69
Professional development[1]	341,021	330,490	3,410.21	3,304.90	105.32
Total allocation			**181,031.33**	**169,825.32**	**11,206.01**

Note 1: Only civil servant teachers are eligible for professional development training. They make up around 79 percent of the total teaching force.

Further cost saving of close to THB 1 billion per annum could be achieved by abolishing the per-student subsidies for small schools and Opportunity Expansion schools, since enhanced and more equitable funding is built into the funding formula for these schools. As discussed earlier in this section, the proposed basic allocation formula already takes into consideration the effect of school and class sizes so that the small school- and Opportunity Expansion school-subsidies can be discarded. This would yield further cost saving close to THB 1 billion per annum (Table 4.10).

Table 4.10. Needs-Based Subsidy Simulations

	Annual expenditure (million THB)		
	Status quo	Reorganized	Saving (mil THB)
Underprivileged subsidy	1,383.73	2,470.36	(1,086.63)
Small school subsidy	493.34	-	493.34
Opportunity expansion school subsidy	498.15	-	498.15
Transportation subsidy		7,540.55	(7,540.55)
Boarding subsidy		2,875.45	(2,875.45)
Total allocation	**2,375.23**	**12,886.37**	**(10,511.14)**

The total cost saving of THB 12.2 billion per annum is more than sufficient to fully fund the per head subsidy for underprivileged students, the transportation grants, and the boarding subsidy for students with schooling access difficulty. The "needs-based allocation" simulation results, presented in Table 4.10, show that the efficiency gains resulting from the school network

reorganization could be used to fund the proposed transportation grants (the least cost air conditioned bus option) and the boarding subsidy for students who would live more than 50 km from their nearest schools after the reorganization, as well as fully fund the underprivileged allocation for all poor students in Thailand.

5. Thailand Fundamental School Quality Standards

The most important reason for proposing the drastic re-organization of the school network is that students attending Thailand's smaller schools are clearly being poorly served. Their schools struggle with lasting teacher shortages, and they have poorer infrastructure and poorer supplies of materials.

This report recommends introducing a set of fundamental school quality standards (FSQLs) for two main reasons: first, by having a set of "minimum standards" for all schools, the current, blatant underinvestment in smaller schools will become more visible. Second, it is hoped that the standards can become a visible and tangible part of the promise that policymakers can make to communities when seeking to convince them to close down their schools. That is, the promise would be: look how inadequate your current school is vis-à-vis these standards. The new school – less than 6 km down the road – meets all of these standards.

Fundamental school quality standards (FSQLs) specify a minimum level of school, teacher and pedagogic standards that if combined are expected to deliver acceptable learning levels. The standards may be articulated in education laws and/or developed separately as part of education sector and quality reforms. The description of standards is usually a combination of thematic area, outcome standards to be achieved, indicators for measuring achievement and sources of information for verification of achievement. Thematic areas and indicators included in different sets of FSQLs vary across countries.

5.1. Why FSQLs?

FSQLs can become a key part of the set of strategies that policy-makers develop for achieving education goals such as quality, equity, and efficiency. Minimum standards can be set for different operational areas, depending on national, regional, and local priorities, and used as a guiding framework for allocation of resources. As systems progress over time, what are considered minimum standards can change. FSQLs are flexible and can be updated to reflect the new status quo and can incorporate new aspirations regarding, for example, use of technology for teaching-learning, development of 21st century skills, training in socio-economic skills, among others. FSQLs, in this way, can establish a culture of continuous school improvement.

Empirical research has identified several factors correlated with improved education quality and better student outcomes. FSQLs can be used as an objective and transparent method for providing information on and setting expectations to all the key stakeholders (school leaders, teachers, students, parents and community) in areas that contribute to the delivery of good quality education. These generally include:

- *School management*: School based management, by decentralizing control from the national government to the local level (which can be a local level of government, community and/or the school) redistributes power over decisions to the level that can better tailor them to the needs of the specific school and students. Good leadership at the school level, therefore, is essential for effective decision-making, management of school personnel, use of resources,

and evidence-based improvement in school quality. Good quality school leadership, however, cannot be presumed. Given the multiple and complex set of activities that school leaders must decide over, execute and monitor, good leadership requires preparation in and on-going upgradation of professional skills. Training and professional development of school leaders and managers need to cover both content as well as practical skills such as organizing meetings, overseeing and counselling teachers and other staff, organizing school activities for continuous school improvement, using information for decision-making on budgeting, planning and implementation of school plans, engaging with the community and other stakeholders etc. FSQLs can incorporate the development and quality of school leadership, management practices and decision-making quality as needed.

- *School autonomy and accountability*: By empowering school leaders and managers, teachers and the community, increasing school autonomy can improve student learning and other outcomes. However, there is evidence to show that the conditions required for effective exercise of school autonomy maybe unevenly distributed across Thailand schools. Schools in poor, rural and remote communities may not have the required capacity for a high degree of autonomous functioning. FSQLs can take cognizance of this variation and build school autonomy levels in a phased manner over time. School accountability can also be strengthened by explicitly including the use of data and evidence in decision-making as a fundamental school quality standard.

- *Equity*: By focusing on a common set of standards, FSQLs by design help achieve equity. They are designed to bring consistency in school quality across all the schools in the country, thereby narrowing both quality and learning gaps that open due to the variety of contexts within which schools operate (urban versus rural, for example). FSQLs can directly affect equity by including as standards the enrolment of and academic support to students who either belong to disadvantaged population groups (including children with special needs and disabilities) or have poor academic preparation and little academic support at home.

- *Teacher quality and effectiveness*: School education is labour intensive, and teacher preparedness – lack of skills and motivation to teach – was identified by the World Development Report as one of the key axes for improving learning outcomes (World Bank, 2018).[37] Thailand has taken several steps in the past to improve teacher quality, especially through the provision of guarantees and scholarships, to attract candidates with greater ability to choose teaching as a profession. There are national norms in place identifying the eligibility criteria for determining who can be an elementary, secondary and higher secondary teacher. These norms and standards can be incorporated into FSQLs. The FSQLs can also be used to monitor the in-service training and skill-upgradation of teachers, and through observations, can provide feedback on the teaching-learning transactions and pedagogical methods used by the teachers in their classrooms. An issue that has been identified in previous research on systemic factors that have a bearing on learning outcomes in Thailand has been the underutilization of assessment information to redirect teaching-learning towards better results (World Bank,

[37] The systematic use of FSQLs aligns with the three main policy actions recommended by the World Development Report 2018: assess learning, act on evidence and align actors.

2015). This short coming of the system can be mitigated by making the use of assessment information as a standard expectation from teachers and schools.

- *For FSQL to provide meaningful information on teacher quality*, Thailand will need to introduce a standardized way of doing classroom observations – to allow observers to "score" what they see in a consistent manner. One such tool would be the TEACH tool developed by the World Bank and available free of charge. Other tools that are available and that can be adapted to the Thailand context can also be explored by the Government of Thailand during the pilot implementation phase.

- *School infrastructure and facilities*: Accumulating evidence from diverse literature shows that school infrastructure and the design of school spaces have meaningful impacts on learning (Barrett et al, 2019). Thailand already has well developed standards for school infrastructure and school accessibility. Apart from school construction quality, other dimensions of school infrastructure and facilities that affect student learning and that can be included in FSQLs can be safety and health features including availability of adequate water for drinking and sanitation, electricity, functional toilets separated by gender, school design that allows easy access for students with special needs, waste disposal, and even the organization of learning spaces.

- *Effective and efficient utilization of resources*: FSQLs can improve the effective and efficient utilization of resources both at the system and the school levels. Despite having adequate teacher numbers, several provinces in Thailand report severe teacher shortages (World Bank, 2015). Even where the number of teachers in a school are adequate, rural schools seem to have the least prepared teachers (World Bank, 2015). FSQLs can help monitor teacher shortages and help policymakers rationalize the distribution of teachers and teacher-quality according to need. Similarly, FSQLs can help policymakers allocate physical and financial resources according to an objective metric, depending on how schools and provinces score on the FSQL survey. At the school level, FSQLs can help school leaders, managers and community stakeholders identify fundamental gaps that can be used as a basis for budgeting and planning. The use of FSQLs for these purposes will also improve transparency and accountability for the use of resources by clarifying which actors are responsible for achieving which standards.

- *Community engagement*: Regular and systematic community engagement can help the school in implementing reforms and new initiatives as the buy-in from parents and community leaders of the culture of continuous school improvement embodied in the use of FSQLs is established. Communities help schools both by way of material resources, donations and through the political power which they can exercise on behalf of the schools. They can also make schools more accountable to the implementation of new policies and reforms. It is hoped that the standards can become a visible and tangible part of the promise that policymakers can make to communities when seeking to convince them to close down their schools. That is, the promise would be: look how inadequate your current school is vis-à-vis these standards. The new school – less than 6 km down the road – meets all of these standards.

4.2. FSQLs for Thailand

Based on the key factors identified as contributing to improved school quality and learning outcomes, a suggestive list of FSQLs for Thailand schools are described in Annex 1. The FSQLs are expected to be used in conjunction with the environment and social safety norms of the Government of Thailand.

In considering which FSQLs are most appropriate for Thailand, consideration also needs to be given as to:

- The time, effort and expense needed to monitor progress towards achievement of the standards. This relates to the number of standards, the ease with which they can be measured and measured reliably and consistently across time and across different schools, the time period between data collection and availability of the data for use, and who within the system would be responsible for collecting and who for verifying the data. The first step towards determining the appropriateness and usefulness of the standards before adoption of a full set will be to pilot the standards, ideally in a sample of schools representative Thailand. The pilot will help in identifying standards to be included and excluded, fine tuning the description of the standards, the range of responses and the standards are understood, and measurement steps, once the standards have been officially endorsed and adopted. The pilot will also provide information on the time taken to measure the standards, the information that needs to be made available in schools to provide complete responses, and the problems and costs of measuring the standards in schools in different locations. The data from the pilot will need to be analysed and the findings used to finalize the list of standards, their description, expected range of responses and acceptable evidence per standard. Some standards may be considered non-negotiable by the Government of Thailand. Another point to note is that the standards are meant to be aspirational, and therefore, even if some standards have low values in the baseline across schools, they can be included in the final set of standards as a goal to be achieved over time. Equally, it is possible to set different expectations of achievement for different schools, depending on their conditions and situation when the standards are first introduced, thereby giving some schools more time to achieve some or all of the performance standards.
- The financial implications of the standards, based on an assessment of the gap between existing practice and the FSQLs, with an estimate of the number of years over which all schools can be expected to achieve at least a core sub-set of standards.
- How the monitoring data would be used to inform the behaviour of different stakeholders (e.g., in the allocation of resources, in development of school improvement plans, in recruitment of teachers, etc.). This means that some mandatory processes would be expected to be based on FSQLs and there would be need for capacity building of the relevant actors to use the data generated. Before the use of standards is introduced, all responsible actors will need to be given information and orientation and their capacity building will need to be carried out for understanding the standards and their measurement, planning and budgeting guided

by the FSQLs, and preparation of school development plans, their implementation and monitoring among other activities.

- How the data collected would be used for accountability purposes, including, for example, whether indices and or sub-indices of performance would be developed (and at what level – school, district, and/or national) and whether the data and/or the findings from the FSQLs would become publicly available (and if so, in what format). There is also the question of who would be responsible for maintaining the database containing the FSQL data.
- Some caveats to consider*: (a)* The suggestive list of standards presented in Annex 1 are based on those that are commonly found in school quality standards across countries,[38] recommendations from past empirical research carried out for Thailand (World Bank 2015), norms of the Government of Thailand (for example the norms related to school accessibility, their infrastructure and facilities), and operationalization of factors considered important in large scale reviews such as those in the World Development Report (2018). The piloting exercise discussed above carried out in a range of school types and conditions will provide information on the suitability of the standards for Thailand. (b) It can be expected that some standards will co-vary in a given period, that is, improvements in one standard would take place at the same time and way as improvement in another standards.[39] If the standards are intended mainly to be used for accountability purposes, to ensure schools are improving over time and achieving an overall acceptable level of performance, then a smaller number of standards could be adopted by reducing the number of standards which co-vary. On the other hand, standards are also intended to provide guidance for the different actors in the education system. For example, a school principal who monitors the school's educational work effectively, is also more likely to use detailed school level data for decision-making in practice and there are several standards related to such data with each type of data having independent value for the principal's decision-making. It is only when the standards exist together can we expect with a greater probability that school principals use evidence-based methods for decision-making towards improving educational outcomes. Additionally, using data and evidence for decision-making is a behavioural standard that several activities deemed as good practices - overseeing educational work, budgeting, planning, and implementation of school plans, etc, which may contribute to school and education quality in non-overlapping and non-linear ways. A principal's use of one type of data, of course, will very likely vary with her use of other types of data; however, with a focus on the behaviour of the principal, the fact of co-variance should not by itself determine inclusion/exclusion of a standard.

Operations Manual for the FSQLs

Prior to the FSQLs being rolled out, the Government of Thailand will need to prepare an FSQLs operations manual that will provide detailed information on how each standard will be measured, frequency of measurement (annual, every two years etc.), quantitative and qualitative evidence to be used for its measurement, among other relevant material. At the least, the operations manual should provide the following for each standard: a description of the standard, the goal/objective the standard is expected to achieve, the quantitative and/or qualitative evidence to be collected and analyzed to

[38] See Annex 2 for examples.

[39] Even the fact of co-variance can change over time, for example, if one standard scales, and the other does not.

determine the value of the standard, the use of the analysis findings to assign the reference school a position on the scale over which the standard is being measured, assignment of responsibilities where required (for example, head of the school, other administrative personnel, teachers, community etc.), examples (*see below*) to minimize misunderstandings or misinterpretations on the part of all the actors, and reference to relevant documents (such as government orders and rules). The operations manual will also make clear the frequency of monitoring and measuring the FSQLs.

A prototype of the operations manual should prepared as part of the pilot for the standards described above and then finalized. Both the set of FSQLs and the operations manual can be made available in all official languages of Thailand for ease of use. Additional support can be provided to schools by establishing helplines, preparing a list of Frequently Asked Questions, and periodic newsletters that can be sent to all schools with information on the uses and benefits of FSQLs.

Illustrative operational manual examples

Example 1

Standard: The principal monitors the effectiveness of the work of teachers and contributes to the quality of their work.

Rationale: The aim of this standard is to assess effective is the leadership of Principals in terms of how they monitor, support and motivate the teaching staff in their schools.

Evidence: Dated agenda and minutes of meetings held by the Principal with teachers including a record of attendance at the meeting with at least 75% of teachers present. The minutes should include notes per agenda item including records presented by the teachers during the meeting (for example, student attendance and performance records), discussion of problems faced by the teachers and time-bound recommendations and resolutions taken, details of the teacher groups formed, record of innovations developed by the teacher groups and their use in the classrooms as recorded in the minutes of meetings.

Responsibility: School Principal

			Scores					
Condition/Standard	Evidence	N/A	0	1	2	3	4	Remarks
The principal monitors the effectiveness of the work of teachers and contributes to the quality of their work.	Meeting Minutes; Records of Teacher Groups formed		No monitoring by the principal takes place	Principal holds annual meetings with teachers and assesses their work and provides them with feedback	Principal holds six-monthly meetings with teachers, assesses their work and provides them with feedback	Principal holds quarterly meetings with teachers, assesses their work and provides them with feedback	Principal holds quarterly meetings with teachers, assesses their work and provides them with feedback and creates teacher	

							groups to provide innovative solutions for general difficulties with teaching-learning faced by most teachers	

Example from a hypothetical school A

Assessment of Evidence: Two sets of minutes are available with the school for two meetings held in the year 20XX. In one meeting, 80% of the school's teachers were present. In the second meeting, only 60% of the school's teachers present. The minutes record the following: discussion of students who are performing well and who are lagging, problems faced by teachers in the classrooms, feedback from the Principal and time-bound recommendations and resolutions towards the problems identified.

Assignment of Score: Since only one meeting satisfies the evidence, School A should be assigned a value of 1 on this standard.

Notes for the Government of Thailand: The meeting quorum of 75% and examples of evidence have been used for illustrative purposes only. The Government of Thailand can decide on an appropriate percentage and evidence that is relevant in the Thai education context.

Example 2

Standard: Teachers apply the newly acquired knowledge in the areas in which they have improved.

Rationale: The aim of this standard is to assess the quality and effectiveness of teacher training and teacher professional development.

Evidence: Records of training and professional development activities attended by teachers in the last 3 years. Unannounced classroom observations by the responsible actors or monitors to whom this responsibility has been assigned. The monitors should visit a sample of classrooms of those teachers who have undergone and not undergone teacher training or professional development in the last 3 years, and make a record of their observations in and assessment of both types of classrooms – whether one type of classroom is better than the other and the specific ways in which they are different, or whether they do not see any difference across both types of classrooms. These classrooms visits can be done over a certain time period – for example, over a month, but must be completed before the subsequent round of the FSQLs.

Responsibility: School Management Committee and School Principal

			Scores	
Condition/Standard	Evidence	N/A		Remarks
Teachers apply the newly acquired knowledge in the areas in which they have improved.	Records of training and professional development activities attended by teachers. Classroom observations		Scores out of 1-5 based on a standardized classroom observation instrument as described in the operations manual. (1-low…. 5-high)	

Example from three hypothetical schools: School A, School B, School C

Assessment of Evidence: All schools must have detailed records of training and professional development of teachers. If a school does not have records, then it is assigned a 'no' score without classroom observations. For School A, observations show a clear difference between the two types of classrooms, those with and without teachers having undergone professional development. For School B, there are no such records. For School C, classroom observations show no difference between the two types of classrooms.

Assignment of Score: In the case where all schools have detailed information, School A is assigned a 'yes' score. Schools B and C are assigned a 'no' score. If schools don't have detailed information, they can be given extra time along with a deadline for putting the information together, and assigned a 'yes' score if the evidence supports the achievement of this standards, or a 'no' score if the evidence is to the contrary, or if the evidence is not available once the deadline is over.

Notes for the Government of Thailand: The Government of Thailand may assign other actors who may be external to the school with the responsibility of classroom observations.

Annex 1

Thailand: Fundamental School Quality Levels

An indicative list

Note: The score scale used for the FSQLs below is a 5-point progressive numerical scale, ranging from 0 to 5. The use of such a scale means that each standard is treated as a close-ended survey question with multiple choices measuring relative performance. For some questions, responses are recorded as Yes/No which can be converted to the common scale by assigning No=0 and Yes=5.

				Scores					
No.	Condition/Indicator	Evidence	N/A	0	1	2	3	4	Remarks
School Leadership									
Principal's leadership and management									
1	The school has a clear organizational structure with defined procedures and responsibilities.	School Organizational chart and school and teacher handbooks are available		Yes/No					
2	The principal monitors the effectiveness of the work of teachers and contributes to the quality of their work.	Meeting minutes		No monitoring by the principal takes place	Principal holds annual meetings with teachers and assesses their work and provides them with feedback	Principal holds six-monthly meetings with teachers, assesses their work and provides them with feedback	Principal holds quarterly meetings with teachers, assesses their work and provides them with feedback	Principal holds quarterly meetings with teachers, assesses their work and provides them with feedback and creates teacher groups to provide innovative solutions for general difficulties with teaching-learning	

								faced by most teachers	
3	The principal provides the conditions for teachers, students and parents to activity participate in decision-making in order to improve the work of the school.	Records of regular meetings with parents' councils, teachers and students		No meetings	Meeting is held at least once a year	Meeting is held at least once a year, and action plan prepared	Meetings are held at least twice a year, and action plan prepared	Meetings are held at least twice a year, action plan prepared and evaluated regularly, and corrective actions taken	
4	The principal uses different mechanisms to motivate teachers.	Records of recognition of good teaching through certificates/awards , cash prizes, skill upgradation opportunities etc.		0 mechanisms			1 mechanism	More than 1 mechanism	
	Education Quality Monitoring and Evaluating Mechanisms								
5	The principal follows a system of continuous school improvement.	Plan for and updates on continuous school improvement		There is no plan for continuous school improvement	Continuous school improvement plan exists	Continuous school improvement plan exists and followed on an ad-hoc basis	Continuous school improvement plan exists and followed regularly	Continuous school improvement plan exists, followed regularly with integrated plans for curricula, assessment and learning standards	
6	The principal monitors and evaluates the	Records of measures taken to improve educational		The principal does not monitor educational work regularly	The principal monitors and evaluates educational work	The principal monitors and evaluates educational work	The principal monitors and evaluates educational work,	The principal monitors and evaluates educational work,	

	educational work and propose measures for improving the quality of work.	performance by grade			regularly but no active measures are taken to improve the quality of work	regularly and measures are put in place for improving quality of work	aligns it with expected learning standards, and measures are put in place for improving quality of work	aligns it with expected learning standards, and measures are put in place for improving quality of work with respect to learning standards for every grade separately	
7	The school uses data from a unique education information system to evaluate and improve the work of the school.	School level EMIS		No School level EMIS exists	School level EMIS exists and is regularly updated	School level EMIS exists, is regularly updated and data is used to track the school's overall performance	School level EMIS exists, is regularly updated and data is used to track the school's overall performance, action plan prepared	School level EMIS exists, is regularly updated and data is used to track the school's performance for every student, grade and class, action plan prepared, and corrective action taken	
8	The principal creates the conditions for continuous monitoring and evaluation of the school's digital maturity.	Digital plan for the school		There is no digital plan for the school	There is a digital plan but not followed	There is a digital plan, but it is followed as and when funds become available	There is a digital plan and it is followed regularly in the annual budget of the school	There is a digital plan and it is followed regularly, budgeted, and expanded through partnerships with industry and other outside institutions	
	Human Resources development								
9	The principal and management	Principal and management personnel orientation and		There is no professional development of the	Principal/management personnel's professional development	Principal/management personnel undergo training/orientati	Principal/management personnel undertake regular self-assessment	Principal/management personnel undertake regular self-assessment	

	personnel plan undergo regular orientation and training activities	training activities plan		principal/management personnel	takes place as a result of OBEC or the Ministry's initiative on an ad-hoc basis	on in management and leadership skills at least once every 3 years	and is evaluated externally based on which he/she undergoes training/orientation in management and leadership skills at least once every 3 years	and is evaluated externally based on which he/she undergoes training/orientation in management and leadership skills every year	
10	The principal encourages the professional development of teachers and provides the conditions for its achievement in accordance with the capabilities of the school.	Records of teachers professional development activities as a part of school functioning plan and execution		There are no teachers' professional development activities as a part of school functioning	The principal plans teachers' professional development activities for some teachers in the school on an ad-hoc basis	The principal plans teachers' professional development activities for all teachers in the school on an ad-hoc basis	The principal plans teachers' professional development activities for all teachers in the school using systematic criteria but not necessarily aligned to students' learning standards	The principal plans teachers' professional development activities for all teachers in the school using systematic criteria aligned with expected learning standards of students	
11	Teachers regularly plan and improve professional performance based on the results of external evaluation and internal/self-evaluation.	Records of teachers professional development activities as a part of school functioning based on evaluation		There are no teachers' professional development activities as a part of school functioning	Teachers' professional development activities take place without any evaluation	Teachers' professional development activities take place through internal evaluation/self-evaluation	Teachers' professional development activities take place through external evaluation	Teachers' professional development activities take place through internal/self-evaluation and external evaluation	

12	Teachers collaborate within schools and network between schools to value and enhance teaching and learning.	Records of within school and between school collaboration between teachers		Neither within school or between school collaboration of teachers regularly	Teachers collaborate within schools to value and enhance teaching and learning but there is no dedicated time for this activity.	Teachers collaborate within and across schools to value and enhance teaching and learning but there is no dedicated time for this activity.	Teachers collaborate within and across schools to value and enhance teaching and learning with dedicated time set aside for this activity.	Teachers collaborate within and across schools to value and enhance teaching and learning, with dedicated time set aside for this activity and have offline and digital access to learning material developed through these collaborations	
13	Teachers apply the newly acquired knowledge in the areas in which they have improved.	Teachers application of newly acquired knowledge and improved classroom transactions through classroom observations		Yes/No					
	Optimal and functional use of financial, human and technical resources								
14	The principal actively manages the school budget towards fulfilling the developmental needs of the school	Budget aligned to active use of financial, human and technical resources towards continuous school improvement. For teaching-related human resources, planning and		The principal follows historical trends in budgeting, planning and use of financial, human and technical resources	The use of budgeting, planning and use of financial, human and technical resources is forward looking but does not use data from the	The use of budgeting, planning and use of financial, human and technical resources is forward looking, uses EMIS/other data x	The use of budgeting, planning and use of financial, human and technical resources is forward looking, uses EMIS/other data and aligned	The use of budgeting, planning and use of financial, human and technical resources is forward looking, uses EMIS/other data and aligned	

		budgeting is done using appropriate teacher demand formula (such as the proposed Teacher demand model discussed in Chapter 2)		(backward looking behavior)	EMIS/other sources		with the continuous improvement/school development plan in place	with the continuous improvement/school development plan in place, and based on evaluations of past analysis of what worked/did not work	
15	Out-of-school material and technical resources (cultural and scientific institutions, historical sites, scientific institutions, economic and other organizations, etc.) are used in the function of teaching and learning.	Use of out-of-school resources in teaching-learning		There is no systematic use of out-of-school resources	Use of out-of-school resources take place irregularly	Use of out-of-school resources is regular and part of school plans	Use of out-of-school resources is regular and part of school plans and the principal develops cooperation and network with other institutions, business and non-profit organizations and the local community in order to develop students' competences.	Use of out-of-school resources is regular and part of school plans and the principal develops cooperation and network with other institutions, business and non-profit organizations and the local community and international cooperation in order to develop students' competences.	
16	Teachers use a variety teaching aids to improve the quality of teaching.			Yes/No					
17	The school involves	Documents		Yes/No					

	students and parents in concrete activities in key quality areas.				
18	The school supports the implementation of projects that develop general and cross-curricular competences.	Project Portfolios of students		Yes/No	
	Programming of educational work				
19	Key target groups (teachers, associates, principal and deputy principal, students, parents, local community) participate in the development of the Institution Development Plan.	Minutes of meetings for the preparation of institutional/school development plans		Yes/No	

20	The school maintains at least one functional means of public communication, such as the information board, the web page, the public information system or the school media, which publishes the school record and other relevant information for students, teachers and other parties.	Information Board/Webpage/school media publication		Yes/No

				Scores					
No.	Condition/Indicator	Evidence	N/A	0	1	2	3	4	Remarks
Teacher planning of educational work									
	Teachers are aware of what is expected of them in terms of school and student goals	Teacher interviews		Yes/No					
21	Teachers use cross-curricular and subject competencies and	Teacher plans for teaching-learning				Teachers focus only on their individual subjects to	Teachers focus only on their individual subject to	Teachers focus on both cross-curricular and own subjects to	

	standards for teaching planning and achieving outcomes					complete the curriculum	achieve end-of-the lesson and grade level competencies	achieve end-of-the lesson and grade level competencies	
22	Teachers' operational plans and their daily preparations show the methods and techniques by which the active participation of students is planned.	Teachers operational plans		No teacher operational plans exist	Teachers operational plans only take into account curriculum completion requirements	Teachers operational plans only take into account curriculum completion requirements and exams/quizzes	Teachers operational plans only take into account curriculum completion requirements and at least two methods and techniques for active participation of students including exams/quizzes some of the time	Teachers operational plans only take into account curriculum completion requirements and at least two methods and techniques for active participation of students in every class including exams/quizzes	
23	The planning of educational work with students is based on analytical research data, the specific needs of students	Data-based teacher educational plans with students		No teacher educational plans exist	Teachers educational plans only take into account curriculum completion requirements	Teachers educational plans takes into account individual student performance	Teachers educational plans takes into account individual student performance and specific needs arising out of their environment	Teachers educational plans takes into account individual student performance and specific needs arising out of their environment and different methods and techniques for bringing individual students up to expected standards	

	Student support								
24	The school has a support system for all students	Records of variety of student support mechanisms at the school other than academic		Yes/No					
25	In support of students, the school engages with key stakeholders	Documents		The school does not include family or legal representatives for student support	The school includes family or legal representatives for student support	The school includes family or legal representatives and undertakes various activities in cooperation with the local community for student support	The school includes family or legal representatives and undertakes various activities in cooperation with the local community and other relevant institutions and individuals for student support	The school includes family or legal representatives and undertakes various activities in cooperation with the local community and other relevant institutions and individuals and multiple government departments for student support	
	Students' personal, professional and social development.								
26	The school organizes programs / activities for developing social skills (constructive problem solving, non-violent communication ...)	Students personal, professional and social development activities at the school outside of the curriculum		Yes/No					

27	The school promotes healthy lifestyles, the rights of the child, the protection of the environment and sustainable development.	Documents		Yes/No	
28	The school offers career counseling to students	Career counseling guidelines and interview with counselor		Yes/No	
	Vulnerable groups and Meritorious students				Vulnerable groups include children with special needs and disabilities
29	The school actively promotes enrollment of students from vulnerable groups.	Percentage of student body belonging to vulnerable groups		Yes/No	
30	The school takes measures to regularly attend classes of students from vulnerable groups	Percentage of attendance of students belonging to vulnerable groups		Yes/No	
31	The school uses an individualized approach/ individualized educational plans	Individual student plans exist		Yes/No	

	for students from vulnerable groups and students with exceptional abilities.				
32	The school works with relevant institutions and individuals to support students from vulnerable groups and students with exceptional abilities.	Partnership documents for support to students belonging to vulnerable groups and students with exceptional abilities		Yes/No	
	Learning Outcomes				
	Quality Education Delivery by School				
33	The school has access to all relevant curricular documents and teacher handbooks and guides for each discipline and school textbooks.	Availability of curricular documents and guides		Yes/No	
34	The school applies the curriculum (structure by disciplines and the number of hours allocated), which corresponds to the legal provisions for the	Curriculum plans and record of hours/days subject wise for the school year		Yes/No	

	respective school year.								
35	The school has strategy to encourage student enrolment at the right age and prevent student dropouts.	Record of student ages by grades and school strategy documents		Yes/No					
	Teacher Quality								
	Teacher Education and Professional Development								
36	Every teacher placed in a school should have the required preliminary educational and professional qualifications by grade and subject according to the national curriculum and legal requirements.	Records of educational and professional qualifications of all teachers		Less than 25% teachers fulfil the requirements	At least 50% teachers fulfil the requirements	Between 50-60% teachers fulfil the requirements	Between 60-75% teachers fulfil the requirements	All teachers fulfil the requirements	
37	Teachers have continuing on-service training**.**	Records of on-service teacher training while employed in this school		On-service teacher training is not regular	One-thirds of the teachers undergo at least one professional development activity annually (a minimum of 5-10 training days in subject	Half the teachers undergo at least one professional development activity annually (a minimum of 5-10 training days in subject	75% of the teachers undergo at least one professional development activity annually (a minimum of 5-10 training days in subject	Every teacher undergoes at least one professional development activity annually (a minimum of 5-10 training days in subject related	

					related pedagogy, content or classroom practice).	related pedagogy, content or classroom practice).	related pedagogy, content or classroom practice).	pedagogy, content or classroom practice).	
38	Annual teacher training needs assessments is carried out regularly	Documents of teacher training needs assessments		Yes/No					
39	Site visits to teachers' classrooms as part of follow up to training (at least one following a training)	Records and observations of sites visits		Yes/No					
	Teacher class management								
40	Teachers successfully structure and connect parts of the class using different methods (forms of work, techniques, procedures	Classroom Observations		Yes/No					
41	Teachers gradually ask questions / tasks / requirements of varying levels of complexity.	Classroom Observations		Yes/No					
42	Teachers direct the interaction	Classroom Observations		Yes/No					

	among the students so that it is in the function of learning (uses questions, ideas, student comments, encourages peer learning).				
43	Teachers make functional use of existing teaching aids and sources of knowledge available to students.	Classroom Observations		Yes/No	
	Student-centric teaching				
44	Teachers adjust the way they work and the teaching material to the individual characteristics of each student.	Classroom Observations		Yes/No	
45	Teachers devote time and attention to each student in accordance with his educational and upbringing needs.	Classroom Observations		Yes/No	
46	Students in need of additional support	Classroom Observations		Yes/No	

	participate in joint activities to encourage their progress and interaction with other students				
47	The and the students respect each other, and the teacher encourages the students to respect each other and in a constructive way establish and maintain discipline in accordance with the agreed rules.	Classroom Observations		Yes/No	
48	The teacher uses a variety of procedures to motivate students, taking into account their differences and previous achievements.	Classroom Observations		Yes/No	
49	The teacher encourages intellectual curiosity and free expression of opinion and	Classroom Observations		Yes/No	

	encourages the students to ask questions.				
50	The teacher shows confidence in the students' abilities and has positive expectations for success.	Classroom Observations		Yes/No	
	Student competencies acquisition				
51	Students' activities / works show that they have understood the subject of the lesson, are able to apply the lessons learned and explain how they came to the solution.	Classroom Observations		Yes/No	
52	The student presents his ideas and presents original and creative solutions.	Classroom Observations		Yes/No	
53	Student applies feedback to solve a task / enhance learning.	Classroom Observations		Yes/No	
	Student learning outcomes				

54	Student scores in the final exam in Thai/Mother tongue and Math are at or above the national average.	Student scores in different subjects		Below 50% of students achieve the basic level of achievement standards in the Thai /Mother tongue and Math tests, and below 30% intermediate level no one places in the advance level	At least 60% of students achieve the basic level of achievement standards in the Thai /Mother tongue and Math tests, and 40% intermediate level and 10% advanced levels.	At least 70% of students achieve the basic level of achievement standards in the Thai /Mother tongue and Math tests, and 50% intermediate level and 10% advanced levels.	At least 80% of students achieve the basic level of achievement standards in the Thai /Mother tongue and Math tests, and 50% intermediate level and 20% advanced levels.	At least 90% of students achieve the basic level of achievement standards in the Thai /Mother tongue and Math tests, and 60% intermediate level and 30% advanced levels.	
55	Students who need additional support are identified and included in supplementary classes according to their needs.	Percentage of students identified as requiring additional support and enrollment information in supplementary classes		Yes/No					
56	Students who receive additional educational support achieve the expected results in the final exam in relation to individual learning goals / outcomes.	Student scores in different subjects		Less than 20% students receiving additional support gain expected outcomes	Between 20-50% students receiving additional support gain expected outcomes	Between 50-60% students receiving additional support gain expected outcomes	Between 60-75% students receiving additional support gain expected outcomes	Above 75% students receiving additional support gain expected outcomes	

57	The results of initial and annual tests and proficiency tests are used to individualize learning support.	Documents		Yes/No					
58	The results of national and international testing are used functionally to advance teaching and learning.	Documents		Yes/No					
	School Infrastructure								
	School Accessibility								
59	All students should be able to access the school within 6 kilometers from their place of residences.	% of students who access the school within 6 km of residence		No students	50% of students	70% of students	80% of students	90-100% of students	
60	Students from other localities are safely transported to the school, in accordance within the relevant legal framework.	Number of students who live in other localities and % transported as per legal framework		No relevant students transported	50% of relevant students transported	70% of relevant students transported	80% of relevant students transported	90-100% of relevant students transported	
61	The school should provide hostels or dormitories for	Number of students who travel one hour		No relevant students live in	50% of relevant students live in	70% of relevant students live in	80% of relevant students live in	90-100% of students live in	

	students who travel more than one hour to school daily.	to school and % living in school provided dorms		school provided dorms	school provided dorms	school provided dorms	school provided dorms	school provided dorms	
	Optimal spaces for learning								
62	The school and all classrooms should not be over-crowded, and students should not be studying in cramped conditions.	Documents and observations		All classrooms are crowded	70% or more classrooms are crowded	Between 50-70% classrooms are crowded	Between 25-50% classrooms are crowded	Less than 25% classrooms are crowded	
63	The number of students per class should be appropriate.	Documents and observations		No classroom has students per class according to norms	70% or more classrooms don't have students according to norms	Between 50-70% classrooms don't have students according to norms	Between 25-50% classrooms don't have students according to norms	Less than 25% classrooms don't have students according to norms	
64	The furniture (desks and chairs for students) in the classrooms and other spaces for school activities is adequate and meets the safety requirements.	Documents and observations		No classroom and other spaces has furniture per class according to norms	70% or more classrooms and other spaces don't have furniture according to norms	Between 50-70% classrooms and other spaces don't have furniture according to norms	Between 25-50% classrooms and other spaces don't have furniture according to norms	Less than 25% classrooms and other spaces don't have furniture according to norms	
65	All classrooms should be equipped with the following: one blackboard,			No classroom has furniture per class according to norms	70% or more classrooms don't have furniture according to norms	Between 50-70% classrooms don't have furniture	Between 25-50% classrooms don't have furniture	Less than 25% classrooms don't have furniture according to norms	

	teacher's and chairs for students, a (transportable) storage box, a (transportable) storage box or locker for instructional materials and teaching aids. (Other than desks and chairs for students)					according to norms	according to norms		
66	The school has a computer device for every 20 students with Internet connection.	Documents and observations		The school has no computers for students	The school has a computer device for every 50 students with Internet connection.	The school has a computer device for every 40 students with Internet connection.	The school has a computer device for every 30 students with Internet connection.	The school has a computer device for every 20 students with Internet connection.	
67	The school should have a sporting facility and a playground.	Documents and observations		Neither			Only a playground or a sporting facility	Both a playground or a sporting facility	
68	The school should have a library or a resource center.	Documents and observations		Yes/No					
69	For secondary schools, the school should have laboratories	Documents and observations		The school does not have any laboratories	The school has less than 50%	The school has 50-60% of laboratories required	The school has 60-75% laboratories required	The school has more than 75%	

	of physics, chemistry and biology as required.				laboratories required			laboratories required	
	Safety and health including design for equity.								
70	The school should be structurally stable and be proofed against natural disasters.	Documents and observations		Yes/No					
71	The school and all classrooms should be of solid construction (walls, floors and roofs) with natural lighting.	Documents and observations		Yes/No					The structural stability of the construction will be determined by the geological properties of the land and surrounding geography.
72	The school premises should be easily accessible to children with disabilities	Documents and Observations		Yes/No					
73	Classrooms should be easily accessible to children with disabilities	Documents and Observations		No classroom is accessible	70% or more classrooms are not accessible	Between 50-70% classrooms are not accessible	Between 25-50% classrooms are not accessible	Less than 25% classrooms are not accessible	

74	The school should have adequate electricity, water and sanitation facilities and waste disposal practices according to norms.	Documents and Observations		Yes/No	
75	The school should have regular maintenance of school buildings and spaces, indoor insulation against damp and moisture, playgrounds, and clear regulations that are effectively enforced.	Maintenance Schedule Records and Observations		Yes/No	
76	The school has first aid kits and immediate access to health centers, and fire safety materials.	Documents and Observations		Yes/No	
77	The school should have enough bathroom facilities, separately for boys and girls as needed, with ease of access for	Documents and Observations		Yes/No	

	children with special needs.				
78	Schools must have wells or other clean water sources and latrines.	Documents and Observations		Yes/No	

				Scores					
No.	Condition/Indicator	Evidence	N/A	0	1	2	3	4	Remarks
79	The school has at the minimum one set of teaching aids and instructional materials per grade and per teacher (textbooks, teaching manuals and teacher guides).	Documents and observations		No teacher has minimum instructional materials per grade taught	Less than 50% teachers have minimum instructional materials per grade taught	50-60% of teachers have minimum instructional materials per grade taught	60-75% of teachers have minimum instructional materials per grade taught	More than 75% teachers minimum instructional materials per grade taught	
80	The school has least 1 set of supplementary reading materials appropriate to each grade taught	Documents and observations		The school does not have supplementary reading materials for any grade	The school has supplementary reading materials for less than 50% of grades	The school has supplementary reading materials for 50 -60%f grades	The school has supplementary reading materials 60-70 % of grades	The school has supplementary reading materials more than &0% of grades	

81	Each teacher has 1 set of teacher supplies (ruler, scissors, chalk, paper, pen).	Documents and observations		No teacher has a full set of supplies	Less than 50% teachers have a full set of supplies required	50-60% of teachers have full set of supplies	60-75% of teachers have full set of supplies	More than 75% teachers have full set of supplies	
	Learning materials and aids for students.								
82	Each student has one set of textbooks in all key subjects	Documents and observations		Less than 25% students have	Between 25-50% students have	Between 50-60% students have	Between 60-75% students have	More than 75% students have	
83	Each student is equipped with a minimum set of learning supplies including notebooks and pencils.	Documents and observations		Less than 25% students have	Between 25-50% students have	Between 50-60% students have	Between 60-75% students have	More than 75% students have	
84	All ethnic minority students provided with materials strengthening the learning of Thai as a second language, after mother tongue language.	Documents and observations		Less than 25% ethnic minority students have	Between 25-50% ethnic minority students have	Between 50-60% ethnic minority students have	Between 60-75% ethnic minority students have	More than 75% ethnic minority students have	All education materials used must consider the language and the appropriateness to ethnic groups and their culture. The use of school materials should be consulted with local ethnic communities as part of the social screening and assessment.

Annex 2

International Examples of School Standards

Introduction

Fundamental school quality levels (FSQLs) 'assure' a minimum level of school, teacher and pedagogic standards that combine to deliver acceptable learning levels. The standards may be articulated in education laws and/or developed separately as part of education sector and quality reforms. The description of standards is usually a combination of operational area, outcome standards to be achieved, indicators for measuring achievement and sources of information for verification of achievement. Thematic areas and indicators included in different sets of FSQLs vary depending on the level of economic and educational development of countries.

Country case-studies

Several countries around the world have developed explicit sets of FSQLs to as part of their education quality reform agendas. Examples from Serbia, Moldova, Vietnam and Malaysia are provided below. These countries have been selected for illustrative purposes because their objectives in developing FSQLs are closest in conceptual design to the aims of the Office of the Basic Education Commission (OBEC).

Serbia

The FSQLs for Serbia are articulated in their Law of the Fundamentals of the Education and Upbringing System, which has been updated from time to time. Thematic areas in the Serbian FSQLs case for school education (which includes pre-school provision) are the following: the school's physical and social environment, planning and programming of educational work, school leadership, teacher quality and competencies, community engagement, the use of technology, etc.

Moldova

Due to declining child population (in an aging society), Moldova has also faced the issue of optimizing the school network. Parallelly, as part of the education reform project (starting significantly in the Year X), Moldova with the aid of external partners developed a set of school quality standards in the areas of: (i) organization of the educational institution, (ii) teaching and learning, (iii) school infrastructure and equipment (including IT equipment), (iv) curriculum and assessment, and (v) administration of the educational institution, certification and values. Detailed standards were developed in each area, along with indicators and a description of the evidence to be used to determine whether and how much the standard has been met.

Vietnam

Since 2004, Vietnam has introduced a set of fundamental school quality levels to be met by schools in the following areas: (i) physical infrastructure, (ii) teaching staff, (iii) school organization and management, (iv) educational socialization, (v) educational activities and quality, and (vi) expected outcomes. Sub indicators were developed under each area – a total of 38 indicators under 4 themes, which were assigned statistical weights to compute a fundamental school quality index. The weights were assigned to reduce inequality of resources between urban and rural/remote schools. The expectation from the FSQL program was that all schools will acquire a set of minimum standards and depending on the availability of resources can even surpass those standards. Annex3 provides the list of indicators and sub-indicators used for the FSQLs in Vietnam.

Malaysia

Malaysia's Education Blueprint covering the period 2013-2025 sets out in detail a phased transformation plan of its education sector, from pre-school to post-secondary education. In particular, a physical and cultural transformation of its school education sector is envisaged, wherein the standards available at the level of the

school will be enhanced over three phases, Wave 1: from 2013-2015 focuses on the basic minimum facilities for a safe and healthy school environment, Wave 2: from 2016-2020 focuses on curricula and pedagogy reforms, and Wave 3: from 2021-2025 focuses on making schools the site of delivery of 21st century skills.

Standards based accountability

Standards-based accountability has been at the fore-front of education reforms in developed countries such as the United States, United Kingdom, and in some countries in Latin America. The most comprehensive example in the former is the No-Child Left Behind (NCLB) which was introduced in 2002 the United States. Federal funding for schools made conditional on them achieving NCLB standards and criteria. Under the NCLB, schools are assessed based on annual testing of students, and all teachers had to be 'highly qualified' in the subject they teach, special education teachers had to be certified and demonstrate knowledge in all the subjects they teach. Over time, states have been given flexibility on how they use federal funding as long as the schools are improving. The NCLB program also recommends that schools use science and research-based instruction and teaching methods. In the United Kingdom, standards-based accountability has been the key policy tool since 1988. In Brazil, school evaluation is done using the Basic Education Development Index (IDEB) scores and the index that is prepared using these scores. Data for the index are drawn from the School Census that is conducted annually covering all aspects of school quality such as infrastructure, teachers, electricity, library etc., and from basic education assessments.

Serbia School Quality Standards (as of 2018)

I. PRESCHOOL EDUCATION QUALITY STANDARDS
1. QUALITY AREA: EDUCATIONAL WORK
1.1. The physical environment encourages the learning and development of children.
1.1.1. Materials, toys and resources are available to children, support research, play and various forms of expression.
1.1.2. The space is structured to encourage activities in small groups, gathering of the whole group as well as independent activity of the child.
1.1.3. Children, parents and educators are involved in designing and enriching the physical environment.
1.1.4. The learning environment (materials, products, panels, etc.) reflects current events and educational activities (topics, projects).
1.1.5. The kindergarten spaces (indoor and outdoor) reflect the shared involvement and learning of children, educators and parents.
1.1.6. Local community spaces are used as a place to learn through the joint activities of children and adults.
1.2. The social environment encourages the learning and development of children.
1.2.1. The group fosters positive relationships, cooperation and solidarity among children.
1.2.2. The relationship between children and educators is based on respect and trust.
1.2.3. The kindergarten creates situations for the interaction of children of different ages / groups (in work rooms, shared open and closed spaces).
1.2.4. The kindergarten fosters relationships of trust and collaboration among adults to support children's learning and development.
1.3. Planning and programming of educational work is in the function of supporting children's learning and development.
1.3.1. Planning of educational work is based on continuous observation, listening to children and following their needs and interests.
1.3.2. Flexibility in the rhythm of the day and in the realization of activities (different opportunities for playing and learning) is nurtured in the realization of the program.

1.3.3. Initiatives, proposals, ideas and experiences of children and parents are taken into account in the development of the program.
1.3.4. Children are encouraged to explore, solve problems, and expand experiences through different play and learning situations.
1.3.5. Different modes of children's learning and participation are supported.
1.3.6. Monitoring, documenting and evaluating the educational process is to support children's learning and program development.

2. AREA OF QUALITY: SUPPORT TO CHILDREN AND FAMILIES

2.1. The institution is a safe and secure environment.

2.1.1 . The implementation of social, preventative-health care and nutrition programs contributes to the safety and security of children.
2.1.2. The institution has a program to protect children from violence, discrimination, abuse and neglect.
2.1.3. The institution provides different ways of informing parents and employees in order to protect the rights of the child.
2.1.4. The preschool space is adapted to the different needs of children and families in order to support safety and their sense of security.

2.2. The institution respects diversity, respects the rights and needs of children and families.

2.2.1. The institution respects the diversity of each child and family.
2.2.2. The institution develops different programs and forms based on the identified needs of the children and the family and the capabilities of the local community or existing resources.
2.2.3. The institution creates team conditions for gradual transitions in order to support the children's experience of belonging to the new environment (departure to kindergarten, transition from PU to school…).
2.2.4. The participation of children in various manifestations in the local community is based on an assessment of the best interests of the child.

2.3. The institution works with the family and the local community.

2.3.1. The program of cooperation with the family is developed on the basis of examining the needs, opportunities and interests of the family.
2.3.2. Different ways of involving the family apply in the institution.
2.3.3. The institution supports the realization of the educational role of the family in accordance with its needs (counseling, open doors, thematic meetings ...).
2.3.4. The institution, in cooperation with the local community, organizes activities that contribute to increasing the coverage of children and the accessibility of programs.

3. AREA OF QUALITY: A PROFESSIONAL COMMUNITY OF LEARNING

3.1. The institution encourages professional communication.

3.1.1. The institution organizes opportunities for mutual information of all participants on different aspects of the life and work of the institution.
3.1.2. Employees adequately apply digital technologies to share information with all relevant stakeholders.
3.1.3. Participation in professional bodies and bodies is based on the principles of teamwork.
3.1.4. Employees cooperate with various institutions (cultural, educational, sports…) in order to realize the program.
3.1.5. Newcomers are supported in their work and adaptation to the new environment.
3.2. The institution fosters a climate of trust and togetherness.
3.2.1. The institution consistently respects the norms regarding the rights and responsibilities of all.
3.2.2. The expert associate and the educator are continuously working together to improve the educational process.
3.2.3. There is constant cooperation and exchange of experience at the institution / facility / work unit level.
3.2.4. In developing and realizing the vision of the institution's development, the perspectives of all participants are taken into account.

3.3. The institution develops a culture of self-evaluation.

3.3.1. Employees re-examine their competencies in relation to the roles and responsibilities of the profession.

3.3.2. Educators and associates critically view their practice through collaborative research and reflection processes.
3.3.3. Appropriate monitoring and evaluation methods are applied in the institution that contribute to a better understanding and development of the practice.

3.4. The institution is a place of continuous change, learning and development.

3.4.1. The institution is a place of joint learning with colleagues, critical review and evaluation of kindergarten practices that take place at the scheduled time.
3.4.2. Educators and professional associates exchange experiences and use the results of research for development.
3.4.3. Planning and realization of professional development is realized on the basis of the analysis of the needs of employees, the institution and the contemporary flows of the educational system.

3.5. The institution represents professional public action and community activism.

3.5.1. Employees are engaged in promoting kindergarten in accordance with the principles of the profession in order to contribute to its visibility in the community.
3.5.2. The institution cooperates with primary schools at the kindergarten / group level to achieve continuity of children's experiences.
3.5.3. The institution cooperates with other institutions, relevant institutions, organizations and associations.
3.5.4. The institution initiates and / or participates in various actions in the local community in order to represent and promote the rights of the child.

4. QUALITY AREA: MANAGEMENT AND ORGANIZATION

4.1. Planning the work of the institution is in the function of its development.

4.1.1. Documents are produced through consultation with key stakeholders.
4.1.2. Institution documents are mutually consistent and reflect the context of the institution.
4.1.3. The roles and responsibilities of the bearers, the systems for monitoring and reviewing the plans are defined.
4.1.4. The development plan is based on the results of the self-evaluation process, external evaluation, projects, etc.

4.2. The organization of the institution's work is efficient and effective.

4.2.1. There is a clear organizational structure with defined procedures and holders of responsibility.
4.2.2. Professional bodies and teams are formed in accordance with the competencies of employees.
4.2.3. Logistics resources are used to support learning.
4.2.4. The Director initiates, establishes and supports cooperation with the local community.
4.2.5. The Director creates the conditions for the use of digital technologies in order to improve the work.

4.3. The management of the director is in the function of improving the work of the institution.

4.3.1 . The Director provides the conditions for the employees to be promoted and their professional development encouraged.
4.3.2. The Director appreciates the suggestions of the Parents' Council for improving the work of the institution.
4.3.3. The director systematically monitors and evaluates the work of employees and teams and contributes to the quality of their work.
4.3.4. The Director plans personal professional development based on self-evaluation of his work and the results of external evaluation.

4.4. The leadership of the director enables the development of the institution.

4.4.1. The CEO shows openness to change and encourages innovation.
4.4.2. The CEO shows confidence in the employees and their capabilities and motivates them in different ways.
4.4.3. The director makes decisions in accordance with the proposals and initiatives of the employees.
4.4.4. The director is professional in his work and gives a personal example to others.

II. SCHOOL WORK QUALITY STANDARDS

QUALITY AREA 1: PROGRAMMING, PLANNING AND REPORTING

1.1. Programming of educational work is in the function of quality work of the school.

1.1.1. The school curriculum is based on the prescribed principles for drafting this document.

1.1.2. Key target groups (teachers, associates, principal, students, parents, local community) participated in the development of the Institution Development Plan.
1.1.3. The content of key school documents maintains the specifics of the institution.
1.1.4. The programming of the work is based on analytical research data and assessments of the quality of work of the institution.
1.1.5. The programming of work takes into account the age, developmental and specific needs of students.

1.2. Planning the work of organs, bodies and teams is a function of effective and efficient work in school.

1.2.1. The annual work plan was adopted in accordance with the school curriculum, development plan and annual calendar.
1.2.2. The operational / action plans of the bodies, bodies, teams, professional associates and principals specified the goals of the development plan and the school curriculum and took into account the current needs of the school.
1.2.3. The plans of organs, bodies and teams clearly reflect work processes and project changes at all levels of action.
1.2.4. Operational planning for bodies, bodies and teams envisages activities and mechanisms for monitoring work and reporting during the school year.
1.2.5. The annual report contains relevant information on the work of the school and is consistent with the content of the annual work plan.

1.3. Planning of educational work is focused on the development and achievement of goals of education and upbringing, standards of achievement / outcomes in teaching subjects, and general intermediate and subject competences.

1.3.1. Teachers use cross-curricular and subject competencies and standards for global teaching planning and achievement outcomes for operational teaching planning.
1.3.2. Teachers' operational plans and their daily preparations show the methods and techniques by which the active participation of students is planned.
1.3.3. The planning of additional teaching and additional work is functional and based on the monitoring of student achievement.
1.3.4. In planning leisure activities, the results of the examination of students' interests are taken into account.
1.3.5. The planning of educational work with students is based on analytical research data, the specific needs of students and the conditions of the immediate environment.
1.3.6 . Preparations for teaching include self-evaluation of teacher work and / or notes on the implementation of planned activities.

QUALITY AREA 2: TEACHING AND LEARNING

2.1. The teacher effectively manages the learning process in class.

2.1.1. The student has clear lesson goals / learning outcomes and why what is planned should be learned.
2.1.2. The student understands explanations, instructions and key concepts.
2.1.3. The teacher successfully structures and connects parts of the class using different methods (forms of work, techniques, procedures…), ie conducts training within the profession / profile in accordance with the specific requirements of the work process.
2.1.4. The teacher gradually asks questions / tasks / requirements of varying levels of complexity.
2.1.5. The teacher directs the interaction among the students so that it is in the function of learning (uses questions, ideas, student comments, encourages peer learning).
2.1.6. The teacher makes functional use of existing teaching aids and sources of knowledge available to students.

2.2. The teacher adjusts the work in class to the educational needs of the students.

2.2.1. The teacher adjusts the requirements to the needs of each student.
2.2.2. The teacher adjusts the way he works and the teaching material to the individual characteristics of each student.
2.2.3. The teacher devotes time and attention to each student in accordance with his educational and upbringing needs.
2.2.4. The teacher implements specific tasks / activities / materials based on the IOP and the individualization plan.

2.2.5. Students in need of additional support participate in joint activities to encourage their progress and interaction with other students.
2.2.6. The teacher adjusts the pace of work to the different educational and educational needs of the student.
2.3. Students acquire knowledge, acquire values, develop skills and competences in class.
2.3.1. Students' activities / works show that they have understood the subject of the lesson, are able to apply the lessons learned and explain how they came to the solution.
2.3.2. The student relates the subject of learning to the previously learned in various fields, professional practice and daily life.
2.3.3. The student collects, critically evaluates, and analyzes ideas, answers, and solutions.
2.3.4. The student presents his ideas and presents original and creative solutions.
2.3.5. Student applies feedback to solve a task / enhance learning.
2.3.6. The student plans, implements and evaluates the project in teaching independently or with the help of the teacher.

2.4. Evaluation procedures are a function of further learning.

2.4.1. The teacher formatively and summatively evaluates in accordance with the regulations, including the evaluation of what students have shown while working in practice * (students' practice in secondary vocational school).
2.4.2. The evaluation criteria are clear to the student.
2.4.3. The teacher provides complete and understandable feedback to the students about their work, including clear recommendations on the next steps.
2.4.4. The student sets goals for learning.
2.4.5. The student is able to critically evaluate their own progress and that of other students.

2.5. Every student has the opportunity to be successful.

2.5.1. The teacher / instructor of the practical teaching and the students respect each other, the teacher / instructor of the practical teaching encourages the students to respect each other and in a constructive way establish and maintain discipline in accordance with the agreed rules.
2.5.2. The teacher uses a variety of procedures to motivate students, taking into account their differences and previous achievements.
2.5.3. The teacher encourages intellectual curiosity and free expression of opinion.
2.5.4. The student has the choice of how the topic is handled, the format of the work or the material.
2.5.5. The teacher shows confidence in the students' abilities and has positive expectations for success.

QUALITY AREA 3: STUDENTS 'EDUCATIONAL ACHIEVEMENTS

3.1. The results of the students at the final exam show the achievement of the standards of achievement of teaching subjects, that is, the achievement of the set individual learning goals.

Note: This standard is only applicable for primary school. Upon passing the high school graduation and final exam program, a special standard 3.1 will be adopted. for this level of education.
3.1.1. Student scores in the final exam in Serbian / Mother tongue and Math are at or above the national average.
3.1.2. At least 80% of students achieve the basic level of achievement standards in the Serbian / Math and Math tests.
3.1.3. At least 50% of students achieve the intermediate level of achievement standards in the Serbian / Math and Math tests.
3.1.4. At least 20% of students achieve an advanced level of achievement standards in the Serbian / native language and math tests.
3.1.5. Student scores on the combined test are at or above the national average.
3.1.6. Students who receive additional educational support achieve the expected results in the final exam in relation to individual learning goals / outcomes.
3.1.7. The average achievement of the departments in the Serbian / Mother tongue and Math tests is uniform.

3.2. The school continually contributes to the better educational attainment of the students.

3.2.1. The results of monitoring educational achievements are used to further develop students.
3.2.2. Students who need additional educational support achieve achievement in accordance with individual learning goals / tailored educational standards.
3.2.3. Students are included in supplementary classes according to their needs.

3.2.4. Students attending supplementary classes show progress in learning.
3.2.5. Students who take additional work hours make progress according to program goals and individual needs.
3.2.6. The school implements a quality student preparation program for the final exam.
3.2.7. The results of initial and annual tests and proficiency tests are used to individualize learning support.
3.2.8. The results of national and international testing are used functionally to advance teaching and learning.

QUALITY AREA 4: STUDENT SUPPORT

4.1. The school has a support system for all students.

4.1.1. The school is taking a variety of measures to support student learning.
4.1.2. The school is taking a variety of measures to provide educational support to students.
4.1.3. Based on the analysis of success and governance, student support measures are taken.
4.1.4. In support of students, the school includes family or legal representatives.
4.1.5. In supporting students, the school undertakes various activities in cooperation with relevant institutions and individuals.
4.1.6. The school supports students in the transition from one cycle to another.

4.2. The school encourages students' personal, professional and social development.

4.2.1. The school organizes programs / activities for developing social skills (constructive problem solving, non-violent communication ...).
4.2.2 Based on the monitoring of students 'involvement in extracurricular activities and students' interests, the school determines the offer of extracurricular activities.
4.2.3. The school promotes healthy lifestyles, the rights of the child, the protection of the environment and sustainable development.
4.2.4. Through teaching and extracurricular activities, students' professional development, ie career guidance and counseling, is encouraged.

4.3. The school has a support system for students from vulnerable groups and students with exceptional abilities.

4.3.1. The school creates conditions for enrollment of students from vulnerable groups.
4.3.2. The school takes measures to regularly attend classes of students from vulnerable groups.
4.3.3. The school uses an individualized approach / individualized educational plans for students from vulnerable groups and students with exceptional abilities.
4.3.4. The school organizes compensatory programs / activities to support learning for students from vulnerable groups.
4.3.5. The school has mechanisms in place to identify students with exceptional abilities and create the conditions for their progression (acceleration; program enrichment).
4.3.6. The school works with relevant institutions and individuals to support students from vulnerable groups and students with exceptional abilities.

QUALITY AREA 5. ETHOS

5.1. Good interpersonal relationships have been established.

5.1.1. At school, there is a consistent adherence to norms that govern the behavior and responsibility of all.
5.1.2. Measures and sanctions are consistently applied to discriminatory behavior at school.
5.1.3. For newly arrived students and school employees, elaborate procedures for adapting to the new school environment apply.
5.1.4. The school uses different techniques for preventing and constructively resolving conflicts.
5.2. Student and teacher outcomes are supported and promoted.
5.2.1. The success of each individual, group or department is accepted and promoted as personal success and school success.
5.2.2. The school has an internal system of rewarding students and employees for the results achieved.
5.2.3. The school organizes various activities for students in which everyone has the opportunity to achieve results / success.
5.2.4. Students with disabilities participate in various activities of the institution.

5.3. The school has a system of protection against violence.

5.3.1. The school has a clearly and clearly expressed negative attitude towards violence.
5.3.2. The school has a network for addressing violence in accordance with the Protocol on the Protection of Children / Students from Violence, Abuse and Neglect in Educational Institutions.
5.3.3. The school organizes activities for school employees, students and parents, which are directly aimed at preventing violence.
5.3.4. The school organizes special support activities and educational work with students involved in violence (who exhibit bullying, suffer or witness it).

5.4. The school has developed cooperation at all levels.

5.4.1. The school has organized cooperation between expert and advisory bodies.
5.4.2. The school supports the work of the Student Parliament and other student teams.
5.4.3. The school supports the initiatives and pedagogical autonomy of teachers and professional assistants.
5.4.4. Parents actively participate in the life and work of the school.
5.4.5. Teachers, students and parents organize joint activities to strengthen their sense of belonging to the school.

5.5. The school is a center of innovation and educational excellence.

5.5.1. The school is recognized as a center of innovation and educational excellence in the wider and narrower local and professional community.
5.5.2. Teachers are constantly reviewing, changing and improving their own educational practice.
5.5.3. Teachers share new knowledge and experiences with colleagues in and outside the institution.
5.5.4. The results of an established system of teamwork and partnerships at all school levels are examples of good practice.
5.5.5. The school develops innovative practice and new educational solutions based on action research.

QUALITY AREA 6. SCHOOL ORGANIZATION, HUMAN AND MATERIAL RESOURCES MANAGEMENT

6.1. The management of the principal is in the function of improving the work of the school.

6.1.1. There is a clear organizational structure with defined procedures and responsibilities.
6.1.2. Professional bodies and teams were formed in accordance with the needs of the schools and the competencies of the employees.
6.1.3. The Director monitors the effectiveness of the work of expert teams and contributes to the quality of their work.
6.1.4. The principal provides the conditions for the employees, the students 'parliament and the parents' council to actively participate in decision-making in order to improve the work of the school.
6.1.5. The CEO uses different mechanisms to motivate employees.

6.2. The school has a system for monitoring and evaluating the quality of work.

6.2.1. The principal regularly exercises instructive insight and supervision in educational work.
6.2.2. Professional associates and teachers in the profession monitor and evaluate the educational work and propose measures for improving the quality of work.
6.2.3. The self-evaluation team realizes the self-evaluation of the school's work in the function of quality improvement.
6.2.4. The school uses data from a unique education information system to evaluate and improve the work of the school.
6.2.5. The principal creates the conditions for continuous monitoring and evaluation of the school's digital maturity.
6.2.6. The principal takes measures to improve the educational work based on the results of monitoring and evaluation.

6.3. The leadership activity of the principal enables the school to develop.

6.3.1. The director, through his dedication to business and behavior, sets an example for others.
6.3.2. The CEO shows openness to change and encourages innovation.
6.3.3. The principal promotes learning values and develops the school as a lifelong learning community.
6.3.4. The Director plans personal professional development based on the results of external evaluation and self-evaluation of his work.

6.4. Human resources are a function of the quality of school work.

6.4.1. The principal encourages the professional development of employees and provides the conditions for its achievement in accordance with the capabilities of the school.
6.4.2. Employees plan and improve professional performance based on the results of external evaluation and self-evaluation.
6.4.3. Teachers, vocational teachers and professional services collaborate within schools and network between schools to value and enhance teaching and learning.
6.4.4. Employees apply the newly acquired knowledge in the areas in which they have improved.

6.5. Material and technical resources are used functionally.

6.5.1. The Director ensures optimal use of material and technical resources.
6.5.2. Teachers continually use teaching aids to improve the quality of teaching.
6.5.3. Out-of-school material and technical resources (cultural and scientific institutions, historical sites, scientific institutions, economic and other organizations, etc.) are used in the function of teaching and learning.

6.6. The school supports the initiative and develops an entrepreneurial spirit.

6.6.1. The principal develops cooperation and network with other institutions, business and non-profit organizations and the local community in order to develop students' entrepreneurial competences.
6.6.2. The school supports the implementation of projects that develop general and cross-curricular competences.
6.6.3. Through school projects, the school develops entrepreneurship, an entrepreneurial orientation and entrepreneurial competences of students and teachers.
6.6.4. The school involves students and parents in concrete activities in key quality areas.
6.6.5. The Director develops international cooperation and projects aimed at developing key competences for lifelong learning of students and teachers.

Moldova School Quality Standards

Operational Standard	Verification Source	Associated quality standard
Dimension 1: Organization of the educational Institution		
1. The educational institution holds all the authorizations and licenses provided by law for all the buildings of the school, including the canteen.	Legal Documents and Authorization Standards	The educational institution ensures the safety of all students. The educational institution ensures the carrying out of quality education.
2. The school budget is balanced.	The budget of the school and the financial documents presented by the Finance Department of the district council or by the local treasury where the school has accounts.	The educational institution ensures the carrying out of quality education.
3. Students from other localities are safely transported to the educational institution, in accordance with the relevant legal framework.	Documents of the educational institution, observations (for example, the existence of school buses, transportation of children)	The educational institution ensures the safety of all students
4. The educational institution collects and updates on-line data for the Educational Management Information System (SIME) and has at least one computer connected to the Internet for school management.	SIME documents	The educational institution includes all children, regardless of nationality, gender, origin and social status, political or religious affiliation, health status and creates optimal conditions for realizing and developing their own potential in the educational process
Dimension 2: Teaching and Learning		
5. The educational institution has qualified teachers for all the compulsory subjects according to the national curriculum and the educational framework plan and for all the optional disciplines established at the school level.	Documents of the educational institution regarding the qualifications of the teachers	Teachers make effective use of educational resources in relation to the aims established by the national curriculum
6. The educational institution provides didactic and psychological assistance and has support staff for the inclusion of students with special educational requirements, as needed.	Individualized educational plans, interviews with representatives of local educational and psychological assistance services	The educational institution includes all children, regardless of nationality, gender, origin and social status, political or religious affiliation, health status and creates optimal conditions for realizing and developing their own potential in the educational process

7. At least 1/3 of the teachers in the educational institution have participated in continuous training programs for teachers in the last 3 years	Training Certificates; Evaluation scores of the teachers	The educational institution ensures the safety of all students. The educational institution ensures the carrying out of quality education.
Dimension 3: School Infrastructure and equipment (including IT equipment)		
8. The educational activities are carried out in well-appointed spaces destined for these activities: a. Classrooms b. Laboratories of physics, chemistry, biology c. Computer room d. Sports hall / field e. Library	Documents of the educational institution and observations	The educational institution ensures the carrying out of quality education. (including construction regulations)
9. School spaces are accessible to students with special educational needs (especially access ramps and accessible sanitary blocks)	Observations	All children benefit from an accessible and favorable environment (including construction regulations)
10. The school buildings, including the canteens, have functional water supply and sewerage systems, internal sanitary blocks, heat and electricity supply, and telecommunications, in accordance with the national norms in constructions.	Observations	The educational institution ensures the carrying out of quality education. (including construction regulations)
11. The furniture in the classrooms and other spaces for school activities is adequate and meets the safety requirements.	Observations	The educational institution ensures the carrying out of quality education. (including construction regulations)
12. The educational institution has a class of computers with at least 11 computers connected to the Internet intended for use by students.	Documents of the institution and observations	The educational institution ensures the carrying out of quality education. (including construction regulations); Teachers make effective use of educational resources in relation to the aims established by the national curriculum
Dimension 4: Curriculum and Assessment		
13. The educational institution has access to all relevant curricular documents, in particular to the Education Framework Plan, methodological guides, curriculum for each discipline and school textbooks.	Documents of the institution and observations	The educational institution ensures the carrying out of quality education.
14. The educational institution applies the curriculum (structure by disciplines and the number of hours allocated), which corresponds to the legal provisions regarding the Educational Framework Plan for the respective school year.	Documents of the institution and observations	The educational institution ensures the carrying out of quality education.
15. The educational institution applies an individualized educational plan for children with special educational requirements, in accordance with the recommendations of the educational and psychological assistance services.	Documents of the educational institution: individualized educational plan for each child with special educational requirements	The educational institution includes all children, regardless of nationality, gender, origin and social status, political or religious affiliation, health status and creates optimal conditions for realizing and developing their own potential in the educational process

Dimension 5: Administration of the educational institution, certification and values		
16. The educational institution has a functional Board of Directors, which includes representatives of teachers, parents, pupils and local public administration authorities.	Documents of the educational institution, interviews with the members of the Board of Directors, observations (if applicable)	Children participate in the decision-making process on all aspects of school life; The school institution communicates systematically and involves the family and the community in the decision-making process; School, family and community prepare children to live in an intercultural society based on democracy.
17. The educational institution knows and applies the existing procedures and mechanisms for preventing, identifying, reporting and solving cases of child abuse, neglect, exploitation and trafficking.	Documents of the educational institution, interview with the school coordinator named on the problems of violence, observations (for example, the existence of a complaint box)	The educational institution develops community partnerships to protect the physical and mental integrity of each child
18. The educational institution maintains at least one functional means of public communication, such as the information board, the web page, the public information system or the school media, which publishes the school record and other relevant information for students, teachers and other parties.	Documents of the institution and observations	Children participate in the decision-making process on all aspects of school life; The school institution communicates systematically and involves the family and the community in the decision-making process

Vietnam Fundamental School Quality Standards

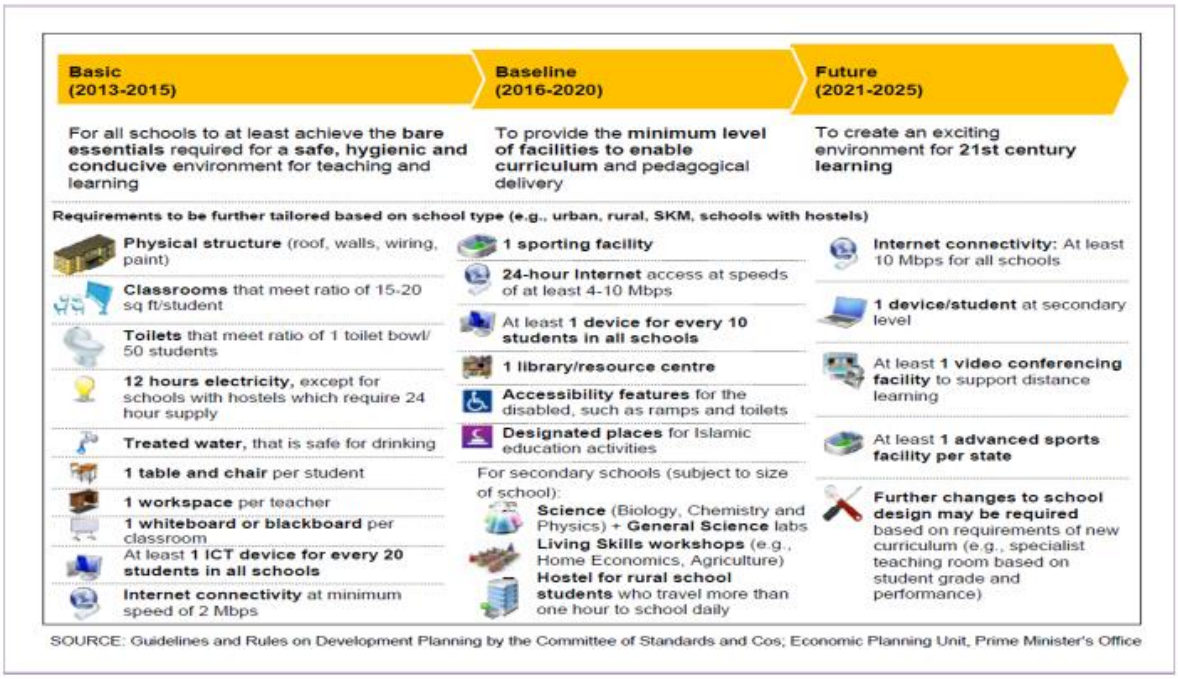
#	Theme and Sub-theme	Requirements
1	**School Organization and Management**	
1.1	**Principals and Deputy Principals**	• All principals and deputy principals should be trained in school management skills; have a good understanding of the basic

		content of state management activities in education and training, primary education objectives and plans, and subject-related matter, syllabus and planning. • All principals and deputy principals should be trained in satellite campus management and support, and school management in disadvantaged areas. • All principals and deputy principals should be able to inspire the confidence of the school staff and local people with regard to professional and pedagogical aspects.
1.2	**Management and Implementation of Effectiveness**	• Each school must have a school development plan and measures to implement the plan and monitor progress. • Each school must provide students the standard 175-week curriculum. • All principals, deputy principals, heads of subjects and professional groups should, according to their functions and responsibilities, manage the activities carried out by teaching and other staff. • All principals and deputy principals should manage and effectively utilize facilities for teaching/learning and other educational activities. • All principals and deputy principals ensure that the quality of teaching, educational services and resources in satellite campuses is the same as in the main campus.
2	**Teaching Staff**	
2.1	**Training Qualification Standard**	• All teachers meet the minimum training qualification standard (9 + 3) and have basic training in working with children from diverse backgrounds, including disabled children.
2.2	**Continuing and theme-based in-service training**	• All teachers in schools and their campuses should receive at least 5 days of professional training each year on relevant classroom management and pedagogical topics (developing teaching aids, multi-grade teaching, extra remediation, Vietnamese language strengthening, inclusive education, school-community coordination, etc.). • All teachers in schools and their campuses with ethnic minority children should be provided with Vietnamese strengthening in teaching Vietnamese to non-Vietnamese speaking children. Schools regularly organize professional and theme-based activities.
3	**Physical infrastructure, teaching-learning equipment and aids**	
3.1	**Schools and Classrooms**	• All schools and their campuses should be located in places that are quiet, dry and accessible to all students. Schools must have no houses and shops inside the precinct area. Schools must have wells or other clean water sources and latrines. • All schools and their campuses should separate teacher toilets and a playground • The classroom for all main schools and their campuses should be of solid construction (walls, floors and roofs) and with adequate natural lighting. Schools and classrooms must be accessible to children with disabilities.

		• All classrooms should be equipped with the following: one blackboard, teacher's desk and chair, sufficient desk and chair for students, a (transportable) storage box, a (transportable) storage box or locker for instructional materials and teaching aids.
3.2	**Basic Teaching Equipment and Aids**	• Each school and campus has at the minimum one set of teaching aids and instructional materials per grade. • Each school and campus has 1 set of supplementary reading materials appropriate to each grade taught. • Each teacher in every school and campus has 1 set of teacher supplies (ruler, scissors, chalk, paper, pen) at all schools and their campuses. • Each teacher at every school campus has 1 full set of textbooks, teaching manuals and teacher guides as required per grade taught.
3.3	**Basic Learning Materials and Aids for Students**	• All ethnic minority students will be provided with Vietnamese language strengthening materials. • Each student has one set of textbooks (mathematics and Vietnamese). • All students in schools and campuses should be equipped with a minimum set of learning supplies including notebooks and pencils.
4	**Implementation of Education Socialization Policy**	
4.1	**Strengthening Organization**	• All schools coordinate with communities to organize Education Meetings at the local level on a periodic basis with a practical focus and participate in local level Education Councils. • All school campuses establish individual parent associations.
4.2	**Activities**	• Parent associations at all schools and campuses carry out regular and efficient activities in terms of cooperating with schools to educate students. • Parent associations should be trained in the specific contents and measures to support students at schools and campuses in all areas in order to build an educational environment that links school, family and community together. • Parent associations should be involved in planning and monitoring of school activities. • Schools organize propaganda activities in various forms to raise the community awareness of primary education objectives, content, methods, primary student assessment, and facilitate community participation in the implementation of primary education objectives and plans. • Schools coordinate with parents in student education and ensure regular contacts among schools, teachers and families. • Families and communities will participate in protecting, maintaining and keeping school facilities in good condition in order to contribute to making schools and satellite campuses always clean and beautiful.
5	**Educational Outcomes**	

5.1	**Educational Outcomes**	• The National primary school curriculum should be used for teaching and learning in school. • Extra-curricular activities should be well organized for students as necessary. • Make "Day for Bringing children to schools" well organized and attractive to children. Ensure that all primary school age children will be enrolled in schools. • Specific attention will be made to enroll children with difficulties and disabilities going to school. • Ensure the implementation of the universal primary completion and illiteracy eradication tasks in localities; develop a plan for right age school enrollment; prevent the problem of repetition and drop-out.

Malaysia - School Infrastructure and Facilities related Standards from the Education Blueprint



6. Environment and Social Standards: Developing and Implementing Environment and Social Risks and Impact Mitigation Measures for Re-organization of School Networks

6.1 Introduction

The Office of the Basic Education Commission (OBEC) has proposed a small pilot project for the re-organization of school networks that applies the Fundamental School Quality Standards for both infrastructure and non-infrastructure aspects. As part of this pilot, it will be important to understand and document the potential environmental and social risks and impacts that are associated with the project and identify appropriate measures to avoid or mitigate those risks. The potential risks, impacts, and response mitigation measures would need to be considered in the preparation, implementation and monitoring of the pilot project.

As part of this reimbursable advisory services, the World Bank is laying out a framework to help Thai officials identify these potential risks. It is our hope that this will be helpful as Thailand embarks on these reforms, starting with a pilot project (using the government's own budgetary resources).

This chapter sets out the options/instruments/recommendations to support students, parents, school personnel, and communities affected by the reorganization of the school network, including, inter alia, (i) strategic communication for stakeholder consultations; (ii) guidance on the analysis of relevant environmental and social issues and risks, as well as recommendations on how to address identified risks in accordance with applicable Environmental and Social Standards; and (iii) guidance on establishing a grievance redress mechanism. These are based on international best practices on environmental and social risks management i.e. the World Bank Environmental and Social Framework (ESF).

Scoping analysis

Thailand has well established laws and regulations with regards to environmental and social impact assessments which focus on project level environmental and social impact assessment while the impacts assessment for program level/policy intervention remain a challenge. The activities proposed under school network reorganization pilot project do not fall into the types and size of projects that require an environment impact assessment (EIA) according to the Ministry of Natural Resources and Environment Notifications on environmental impact assessment which include requirement for social impact assessment. Nevertheless, research on school consolidation indicates that there are significant social risks and impacts associate with the reorganizations of the school networks. These impacts are disproportionately felt where the re-organization occurs in poor remote areas, with ethnic minority communities, or in conflict affected areas in Thailand's Deep South. Small schools operating in these areas address potentially unique community needs. Some potential risks and impacts could include resistance to school merging by local stakeholders, higher rates of school dropout especially young female students, safety of some young children who may have to travel longer distances, increased expenses and time spent on school transportation and limited parental and community engagement in school/students' activities. In addition, experience elsewhere points out potential social risks and concerns from ethnic minority groups including limited access to project information for ethnic parents; limited options for raising complaints and concerns; parents not supporting or participating in

school consolidation for fear that their children would potentially not speak their ethnic language or follow their culture and identity; community leaders not supporting or participating for fear that local values and practices would not be included in the school curriculum; teachers are not local and thus are challenged to communicate with students; and students at smaller remote area schools find it difficult to commute to larger consolidated school hubs.

Where planned and executed in a deliberative manner the consolidation of schools creates better quality and more accessible education services in addition to reducing spending inefficiencies. However, there are significant social risks associated with the challenge of managing school consolidation. The most significant social risk associated with school consolidation is the loss of community activity and organization involved in the closure of an established school. The failure to recognize and plan for what is lost beyond a narrow focus on optimizing provision of formal education can have significant consequences that are disproportionately felt in smaller, more remote communities. Decision on which schools to close should therefore be well planned, involve participation of those affected, and proceed only where educational benefits are significant and impacts on communities manageable. Significant social risk involves:

Retrenchment and removal of secondary economic contribution: even where teachers may be relocated other personnel may find it harder to find new positions given dramatic reduction in schools. While the focus is on teaching staff, many other roles disappear when a school closes (cleaners, caregivers, administrative assistants, security). These roles are more vital in smaller communities. Activities that come with maintenance of an active school (food provision, transport, money cycling back into local shopfront businesses) can be significant. Adverse impacts are disproportionately felt the smaller the community as the school will be a larger secondary economic contributor.

Impact on sense of community: well-established schools have value far beyond formal curriculum: School closure impacts on broader social relationships and solidarity where the school is considered a community centre for all sorts of activities. Schools are where parent-teacher organizations bring communities together and galvanize other social groups and activities (Thailand has a rich network of local culture centres with school links) and other social groups rely on student support, or even school space, the vitality of these sites and activities may decline.

Family pressures associated with the transition: may arise where parents are committed to local schooling and want children to have that choice. This may involve fears children will be marginalized in larger schools and not receive quality education (larger teacher-student ratio) or fit in. Larger schools mean parents less involved than they would have been in small schools, adding to these concerns. For ethnic groups an additional cultural distance and fears of marginalization may exist where small communities are ethnically homogenous and may become a minority in the newly consolidated school.

Concerns of the receiving community: communities where existing schools will be expanded under the consolidation may have concerns about increasing teacher-student ratios. Where there are significant wealth inequalities there may be concerns about the consolidation process (avoidance of integration of poor communities). More generally the rearrangement of resources has potential to generate perceptions of unequal provision unless clearly planned and communicated.

Poor communications about the objective, process and decision-making: Uncertainty over outcomes may manifest in student-teacher tensions, reduce quality of actual teaching, disciplinary

problems emerging as symptom of failure to manage change, Given the scope and scale of this proposal, the amount of administrative bureaucracy required could lead to delays, disputes and need clear measures for dialogue, receipt of feedback and response. For these reforms to proceed, it will be important to find the right balance between creating an inclusive, consultative process that gives parents and teachers an opportunity to voice and express their concerns while at the same time not creating a process that will make it impossible to close schools.

Key recommendations for addressing these issues are:

Stakeholder analysis and consultations informing decision-making: Both communities that will lose schools and those that will receive expanded schools should be closely consulted and their concerns should inform the decision on whether and how to proceed. This should involve participatory survey and design in the plan for consolidation. Top down decisions risk resulting in administrative blindness toward concerns. Without a clear and well devised plan for consolidation, teachers and administrators and parents may be excluded. This should include clearly described procedures for strengthening feedback and response to complaints and concerns (grievance redress).

Successful pilot exercises encourage community acceptance: the most effective way of encouraging community acceptance of a school consolidation is to demonstrate the benefits by ensuring a successful pilot. Where communities can participate in decision-making, can see examples where the benefits outweigh the loss of an existing school, or where integration of diverse students improves outcomes, they are more likely to support similar approaches of their own. The opposite also applies, and a failed pilot may derail efforts to achieve community acceptance elsewhere.

Social assessment at consolidation sites to identify those disproportionately affected and recommend tailored measures to address: should be undertaken to confirm the extent of these risks. The assessment should characterize the overall value of schools as community centres, identify the disproportionate impacts of a loss of such centres on small, remote communities and build on the measures proposed above with tailored communications and participatory decision-making. Better assessment leads to more distinct options in choice of consolidation. The social assessment should:

Inform the criteria for school consolidation to include universal accessibility, socio-economic conditions and cultural appropriate measures especially for ethnic students.

Describe an early warning system to identify school communities where students are particularly at risk of dropping out. A large body of literature exists on identifying warning signs of at-risk, assessing reasons why students drop out.

Analyze early grade reading and math to identify children that are falling behind. This would inform data needed to show that children being moved from a small school to a larger school results in better learning. Findings should also inform and help to convince communities (and CSOs) of the benefits of consolidation

Survey public perception around small schools and the quality of education. Identify current attitudes and how they vary across the country/population groups. This will inform communications strategy.

Describe a practical process monitoring approach: document the how a particular geographical area managed to consolidate its school network (leadership, participation and consultation, messages delivered and by whom which made a difference. Lessons from such monitoring should systematically inform learning about locations that moved forward vs. those that have not progressed.

On the management of risks and impacts associated with infrastructure development, various and comprehensive standards and guidelines for school infrastructure and operations had been established. These include OBEC School Infrastructure Standards, Draft Standards for Pracharath School (Best Practices School), Manual for School Safety and Manual for School Environmental Sanitation developed by the Department of Health of the Ministry of Public Health, etc. These standards and manuals describe, among other things, requirements for classroom and school facilities design and landscaping (tree plantation and its benefits), construction, drawing, plans and standard Bill of Quantity (BOQ), construction supervision and school operations. Various E&S aspects covered in these documents include water and sanitation, food sanitation, pollution management, health, life and fire safety and security, earthquake resilience design, facilities for disabilities and special needs students, learning environment including on connection with local communities, etc. A detailed review of these standards and manual and other relevant national laws, regulations against international best practices will be part of the Environment and Social Management Framework (ESMF) which should be prepared during the design and preparation of the pilot project as mentioned earlier.

Box B.6.1: How does the World Bank support clients in identifying and mitigating potential Environment and Social Risks/Impacts?

The World Bank Group has developed an Environmental and Social Framework (ESF) consisting of Environmental and Social Policy which includes ten integrated Environmental and Social Standards (ESS) to identify, assess and manage the environmental and social risks and impacts associated with the projects throughout the project life cycle. The ESF guides the assessment and management of environmental and social risk informing the design and implementation of investment projects by:

- Avoiding, minimizing and mitigating adverse impacts on people and the environment;
- Promoting worker and community health and safety;
- Promoting the efficient and equitable use of natural resources and ecosystem services;
- Ensuring that there is no prejudice or discrimination toward project-affected individuals or communities and giving particular consideration to Indigenous Peoples, minority groups, and those disadvantaged or vulnerable, especially where adverse impacts may arise, or development benefits are to be shared;
- Conserving or rehabilitating biodiversity and natural habitats
- Maximizing stakeholder engagement through enhanced consultation, participation and accountability.

There are 10 ESSs covering different aspects of the development project and the application of each ESS depends on the scope, level of risks and impacts of the project and its context.

6.2 Potential environmental and social risks and impacts

Experience with school consolidation around the world and research show that school consolidation can create both positive and negative effects, as well as direct and indirect impacts on the environment

and stakeholders depending on the scope and context of the planned consolidation. Different stakeholders such as teachers, students, parents, communities – especially vulnerable populations such as young female, minority, and disabled students – would have different expectations and needs from the consolidation. Positive and negative impacts or concerns identified from international research that focus on several social, safety, economic and environmental aspects.

Positive impacts arise from a number of sources. Fixing the shortage of teachers would enable teachers to teach the subjects for which they are best-qualified. Hub schools would have improved educational materials and infrastructure, which would give students a greater set of options for academic study, as well as access to technology to expand the materials and resources available, and improve their non-academic experience as they could have wider range of friends and set of school-based activities. Improved infrastructure would likely increase access for students with disability and make the learning environment more conducive for them. All of these benefits are expected to lead to improved learning outcomes for students, in both academic and socio-emotional skills domains, leading eventually to improved life-chances after leaving school both for further education and success as adults. For the system as a whole, these changes are expected to reduce the significant learning and achievement disparities across the Thai educational system while enhancing the efficiency of spending. Finally, the investments would result in infrastructure which is better for the environment, more energy-efficient, and more resilient to external shocks (such as from climate-related disasters). Negative impacts include different concerns from stakeholders including: i) increased household expenses of affected teachers, students and parents; ii) potentially weak relationships between teachers and parents, as it is difficult for parents to travel to new schools; iii) affected communities would have weaker relationships with the host schools, thus communities would have limited participation in managing learning; iv) students that would be moved to the new schools often come from lower socio-economic status households than students in the host schools, students might feel unequal, impacting their learning; v) teachers feel threatened of being laid off or transferred to new schools/communities which would impact their families; vi) safety concerns for young students (age 6-12) to travel to new schools, especially for young girls and disabled children; vii) student dropouts due to parental concerns for their safety and for higher expenses for transportation; viii) safety of students, teachers and communities during school renovations, as well as protection from construction nuisance e.g. dust, noise, vibration or increasing waste; and, ix) safety of construction workers during school renovations.

Table 6.1 below provides a preliminary screening of the proposed activities of the pilot project for potential risks and impacts against the environmental and social standards and describes recommendations for mitigation and management measures to be applied to address those risks.

Table 6.1: Preliminary environmental and social risk screening and mitigation roadmap using the World Bank environment and social standards

Narrowing the Learning Gaps between Schools
Objective: Provide technical assistance to Equitable Education Fund (EEF) to develop a plan to improve access to quality primary education (from preschool until primary completion) for children in small and under-resourced schools. It is expected that this technical advice on how to design a project to narrow the performance gaps between schools in selected rural areas in Thailand will be used to develop a small-scale pilot program. **Activities**: Using the simulation model with one set of assumptions, a school network reorganization could reduce the total number of schools nationwide from 29,466 to 12,346. It is estimated that 17,120 Affiliated Schools could be merged with 6,821 Hub schools nation-wide. Class sizes in these schools can be very small, especially for Affiliated Schools where primary level classes average less than 13 students. In the school consolidation exercise, only the Small and the Non-small schools are considered candidates for school consolidation. The suggested Maximum allowable enrolment size for Hub School after consolidation is 500. Locations of schools are scattered throughout the country. The government's intention is to adequately staff and equip a number of "protected" primary schools and small primary "hub" schools which are strategically located so that they are able to accommodate students from other nearby small "affiliated schools", which will be closed down. The sites and the numbers of schools to be consolidated under the pilot project is unknown at the time of RAS preparation. Potential small primary schools are likely to be in poorer regions where they predominately serve the socio-economically disadvantaged student populations.

ES Standard	Potential risks and impacts	Recommended mitigation measures
ESS1: Assessment and Management of Social Risks and Impacts	For school consolidation projects, international experience indicates that the re-organizing of school networks could create significant social risks and impacts Some of these risks identified in the earlier section include: Local stakeholders – parents, students, communities, school principals, teachers, local administration, and local politicians may be resistant to the idea of merging local schools with others; Safety of some young female students who may have to travel longer distances; Student dropouts due to parental concerns for their safety, especially among female students; Increased expenses related to moving some adversely affected children to new schools; Increased time spent on school transportation for some adversely affected students could take them away from social activities, sports, extra-curricular and tutoring; Limited parental engagement in school/student activities; Teachers feel threatened of being laid off or transferred to new schools or communities which would impact their families; Teachers need to adjust to new grades, new curriculum or changes in their teaching duties. Criteria to identify potential "hub," "affiliated," and "protected" schools: potential risks could include that the government only uses economic and technical criteria for the selection of participating schools without input from key stakeholders in the areas.	**1) Social Impact Assessment (SIA)** to identify and understand potential social risks and impacts on stakeholders - project affected populations especially vulnerable and marginal groups including ethnic minority groups, and mitigation measures to address those risks and impacts. SIA would need to be developed prior to decision on selection of schools for consolidation and conducted to obtain feedback from stakeholders including the proposed pilot project criteria and consolidation methodology and options before the criteria and methodology are finalized. **2) Updated Criteria and Methodology for school consolidation.** The criteria regarding universal accessibility, socio- economic conditions and culturally appropriate measures for ethnic groups should also be integrated in the overall school consolidation methodology, and in the FSQL standards of the non- infrastructure aspects.

ES Standard	Potential risks and impacts	Recommended mitigation measures
ESS1: Assessment and Management of Environmental Risks and Impacts	Potential environmental risks and impacts caused by school network consolidation are expected to be moderate. Activities will involve rehabilitation/ repair/ upgrade of existing school buildings or facilities to accommodate increasing number of students. In some cases, it may require construction of new classrooms and supporting facilities e.g. student dormitory, canteen, library, etc. The project activities will focus on small and non-small schools which site-specific activities within the defined scope will be identified after selection of schools. Potential environmental impacts from these civil works may be derived primarily from dust, noise and vibration and wastewater from construction activities, generation of construction and domestic waste, limited site clearance for new construction, student and teacher safety during construction/rehabilitation and transportation of equipment, worker health and safety from construction, worker sanitation, use of construction materials, etc. These impacts are expected to be site-specific and can be easily mitigated by implementation of readily available mitigation measures. During school operation, unsafe design, installation and operation of additional classrooms and facilities may create safety risk to students and school staffs. It is unlikely that school rehabilitations will affect biodiversity/natural habitats or environmentally sensitive areas and cultural heritage since activities will be carried out within existing school boundaries.	3) **Environmental and Social Management Framework (ESMF)** consisting of guidance for screening and scoping of relevant site specific environmental, and community health and safety risks and impacts and development of management actions to be developed prior to implementation of project civil works. The ESMF will also describe how the various ESF requirements are incorporated in the existing FSQL standards. Existing government framework on environmental and social assessment, development and implementation of the project as well as international good practices should be considered in the preparation of ESMF. The ESMF should include an **Environmental Code of Practice (ECOP)** that should form part of bidding document and contract for civil works. The ECOP provides guideline to manage impacts from rehabilitation /repair / upgrade of school buildings and facilities and construction of small buildings. 4) **Updated FSQL Standards** Following findings/recommendations from the ESMF (including social impact assessment), the FSQL Standards should incorporate findings from the consultations as well as the relevant requirements in the ESF including life and fire safety standards, pollution management, stakeholder engagement plan, etc.

ES Standard	Potential risks and impacts	Recommended mitigation measures
ESS2: Labor and Working Conditions	Protection of workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers may not be treated fairly. Use of forced labor and child labor	5) **Labor Management Procedures (LMP) and Labor Grievance Redress Mechanism** to be developed in order to ensure that different types of workers associated with the project are protected and that terms and conditions of employment are according to the national labor law. The LMP should include codes of conduct and clear prohibitions on interaction with local students and communities.
ESS3: Resource Efficiency and Pollution Prevention and Management.	School renovation/upgrade may cause general construction nuisance e.g. noise, dust, construction wastes and construction safety risks. Increasing number of students in Hub schools during operation would increase volumes of non-hazardous waste, wastewater and use of water and energy resources that are expected to be minor and able to be managed according to available codes of practice	6) **Environmental Code of Practice (ECOP)** to manage impacts including pollution generated during school rehabilitation/upgrade. Integration of relevant requirements in the ESF into **FSQL Standards** including pollution management and efficient use of resources (water, energy, etc.)
ESS4: Community Health and Safety	Impacts on health and safety of children and school staff during the renovation of the schools; project-related road safety and traffic accidents especially where project activities occur within areas frequently used by school children; potential impacts from unsafe design, operation of infrastructure and equipment; impacts on persons with disabilities where school buildings are not designed to ensure accessibility of services; Personal safety of young female students traveling long distances; Student dropouts due to parental concerns for their safety, especially among female students; SEA and gender-based violence risks associated with interaction between laborers and school children; Labor influx is anticipated to be minor as construction activities are consist of minor renovations and construction of new classrooms on existing sites.	7) **ESMF (including ECOP)** to include screening for and management actions for preventing student and community on issues related to road safety and traffic management during construction and operation, clear signage, barriers for separation of labor and local community and student populations during construction; worker codes of conduct to be included in labor management procedures and a referral to service providers for cases of SEA or gender- based violence to be part of the project grievance redress mechanism (GRM);

ES Standard	Potential risks and impacts	Recommended mitigation measures
		8) **FSQL Standards** should include proposals for inclusion of universal access (wheelchair ramps and other services) services where students with disabilities are present should be considered in design of school renovations and life and fire safety aspects.
ESS5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	New pre-primary classrooms are to be constructed within existing primary school land boundaries. The project does not expect to build or renovate buildings or conduct civil work outside of existing school lands. Acquisition of private land, physical relocation and, or loss of private assets such as trees and structures and physical relocation are not anticipated. Land acquisition and resettlement activities are not expected for the pilot project.	Not relevant
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	All school rehabilitation/upgrades or building of new small-scale structures will occur within existing school boundaries and the process of consolidation is aimed at reducing the number of school building locations across the country. There are no anticipated risks or impacts to existing biodiversity.	Not relevant
ESS7: Indigenous People	Ethnic minority communities are more likely to be located in remote areas of the country. Consolidation may increase the challenges associated with accessing school and disproportionately affect those communities whose participation rates are already low. In the areas where the ethnic groups reside, some potential risks could include: Limited access to project information for ethnic parents; Limited grievance mechanisms; Parents not supporting education participation for fear that their children would potentially not speak their ethnic language and follow their ethnic culture and identity; Ethnic community leaders not supporting education participation for fear that values and practices of local agricultural and traditional healing would not be included in the school curriculum; Teachers are not ethnic natives and thus are challenged to communicate with students; Students at smaller remote area schools find it difficult to commute to larger consolidated school hubs	9) **As part of the Stakeholder Engagement Plan, an ethnic group consultation strategy** to be developed to ensure that ethnic groups present in, or with collective attachment to, the project area are fully consulted about and have opportunities to actively participate in project design and the determination of implementation arrangements. Consultations should include the issues regarding accessibility, affordability, socio- economic conditions and cultural appropriate measures for ethnic

ES Standard	Potential risks and impacts	Recommended mitigation measures
		groups. Consultations should also obtain feedback on the criteria, the consolidation methodology and options. This strategy should be implemented prior to the selection of participating schools in order to inform decision-making.
ESS8: Cultural Heritage	The project is unlikely to affect known tangible cultural heritage sites. There is minor chance that heritage is identified during civil works undertaken upon school grounds and chance finds would be addressed in the ECOP. The project's physical components are unlikely to impact on intangible heritage	Not relevant
ESS9: Financial	The project does not involve financial intermediaries	Not relevant
ESS10: Stakeholder Engagement and Information Disclosure	Parents, students, communities, school principals, teachers, local administration, and local politicians may be resistant to the idea of merging local schools with others; This resistance may involve a range of concerns about change to quality of education, increased education and transport costs, safety of students traveling long distances; factors that may exclude participation of teachers and students in the transition to new schools. Students from remote areas and ethnic minority communities may be especially at risk of failing to make the transition to new schools due to geographic, cultural and linguistic barriers. Other vulnerable groups may also not have their concerns considered and integrated into project design, such as persons with disabilities requiring universal access to school buildings. A transparent and coordinated stakeholder communications campaign will be required to identify those vulnerable groups in need of assistance to participate in consultations on the criteria for selection of participating schools and on the support and services to be provided to stakeholders in order to transition to new schools.	10) **A stakeholder engagement plan (SEP):** Key stakeholders including project-affected parties, vulnerable groups, as well as interested parties would need to be identified and analysed to identify those in need of assistance in order to participate in consultation activities. The SEP should identify engagement activities, messaging, tools and timeframes for effective engagement and meaningful consultations with the identified stakeholders throughout the project cycle. It should include a grievance redress mechanism to ensure that stakeholders have appropriate venues to provide feedback and recommendations on a timely manner. The GRM would also be sensitive to SEA/GBV-related complaints and include avenue for referral to third party services providers

6.3 Recommended Mitigation Measures

The Office of the Basic Education Commission (OBEC) will oversee the design and implementation of the pilot school consolidation project. It is recommended that OBEC assigns staff or recruits competent environment and social consultant(s) to be responsible for the application of the identified ESSs and mitigation measures into the following stages of the pilot project.

During the design and preparation stage, the main responsibilities of the E&S staff/consultants would include:

i) Conducting social impact assessment through meaningful consultations with direct project-affected stakeholders and other interested stakeholders including vulnerable groups including ethnic minorities residing in the potential project areas. These consultations will be conducted as part of the social impact assessment. Information regarding the proposed project, school selection criteria, potential risks and proposed environment and social management tools would be discussed, and stakeholders would have an opportunity to express their views and recommendations. OBEC infrastructure and non-infrastructure sub-committees would review findings from the consultations and integrate them into the FSQL standards and the project design especially the criteria for the selection of schools and E&S management tools;

ii) Developing other E&S management tools using inputs gathered from the social impact assessment namely the Environment and Social Management Framework (including the Environmental Code of Practice), the Stakeholder Engagement Plan (including communication plan and the Ethnic Group Consultation Strategy), the Labor Management Procedure and Labor Grievance Redress Mechanism, and the overall project Grievance Redress Mechanisms. Scope of work for each E&S Management Tool will include a review of relevant national laws, regulations and standards/guidelines against international good practices and recommend areas that would need to be improved when design and implement the pilot project. The most critical legal documents that need to be reviewed include:

a. The 2550 Constitution Chapter 3, "Rights and Liberties of Thai People"

b. Ministry of Education Regulation 2550 on School Consolidation (stakeholder consultation requirement)

c. OBEC Infrastructure standards, (Draft) Standards for Pracharath School (Best Practice School)

d. Department of Health, Ministry of Public Health, Manual for School Safety and Manual for School Environmental Sanitation

e. Labor Law 2562, and other related laws and regulations used within the Ministry of Education

f. Existing grievance mechanisms such as the Dhamrongtham Center under the Ministry of Interior and the Community Justice units under the Ministry of Justice

Please see the attached annex for detailed guidelines on how to develop these tools.

OBEC infrastructure and non-infrastructure sub-committees would integrate findings from E&S management tools into the FSQL standards and the project design. Final E&S management tools approved by OBEC committee should be displayed on the project website and be distributed to stakeholders especially at the project sites.

During implementation throughout the pilot project life cycle, the E&S staff/consultants would need to make sure that all environment and social activities are implemented according to the approved management tools. E&S staff/consultants would continue to engage with key stakeholders in line with the stakeholder engagement plan to provide updated information and to gather feedback. Grievance redress mechanisms should be established in close coordination with the existing government mechanisms. Cases and feedback should be responded to on a timely basis and be documented in the project progress reports.

Annex 6: Environmental and Social Standards (ESS) and Their Application[40]

A 6.1 Introduction of Environment and Social Standards:

The WB ESSs are designed to support the clients to manage the environmental and social risks and impacts and improve the project performance. Depending on the scope and context of the project, the World Bank and the clients would decide on what relevant ESSs would be applied to the projects. For the activities proposed for the pilot project, the advisory note has identified 6 ESSs that the OBEC would apply to assist with the design, implementation and monitoring of the project. These 6 ESSs include:

ESS 1: Assessment and Management of Environmental and Social Risks and Impacts
ESS 2: Labor and Working Conditions
ESS 3: Resource Efficiency and Pollution Prevention and Management
ESS 4: Community Health and Safety
ESS 7: Indigenous Peoples
ESS 10: Stakeholders Engagement and Information Disclosure

The objectives and key questions that would be used to screen the risks and impacts of the projects can be summarized in the below table.

[40] 2016. "World Bank Environmental and Social Framework." World Bank, Washington, DC. And WBG guidance notes.

Table A.6.1. Relevant ESSs' Objectives and Key Project's Risks and Impacts Screening Questions

ESS	Objectives	Key questions
Environmental and Social Risks Assessment and Management	• To identify, evaluate and manage the environment and social risks and impacts of the project. • To adopt a mitigation hierarchy approach to: i) anticipate and avoid risks and impacts; ii) where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; iii) once risks and impacts have been minimized or reduced, mitigate; and iv) where significant residual impacts remain compensate for or offset them, where technically and financially feasible. • To adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project. • To utilize national environment and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate. • To promote improved environmental and social performance, in ways which recognize and enhance client capacity	• Does the size and magnitude of the project have the potential to cause wide ranging environmental and social impacts at a regional scale? • Is the location of the project in a sensitive location considering ecological, social, cultural, spiritual or other important values? • Has an alternate location for the project been suggested that would be more acceptable in terms of environmental and social risks and impacts? • Are there other projects and activities that in combination with the proposed project that could lead to significant cumulative adverse impacts? • Is there significant public opposition or support for the project? • Are all relevant direct, indirect and cumulative environmental and social risks and impacts considered and do the nature of these risks and impacts that require an environmental and social assessment? • (In case the answer to the previous question is YES), Which is the type of social and environmental assessment required considering the expected risk rating of the project and/or subprojects (e.g. ESMF, ESIA, stand-alone Social Assessment, ESMP, Cumulative Impact Assessment, etc)? • Is there a risk to impact disadvantaged or vulnerable groups? • And to cause discrimination toward individuals or groups?

ESS	Objectives	Key questions
Labor and Working Conditions	• To promote safety and health at work. • To promote the fair treatment, nondiscrimination and equal opportunity of project workers. • To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate. • To prevent the use of all forms of forced labor and child labor. • To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. • To provide project workers with accessible means to raise workplace concerns.	• Will the development of the project have the potential for immigration of workers and persons seeking employment? • How are covered the project's environmental and social risks and impacts related to labor and working conditions? • And related risks like harmful child labor or forced labor? • And key general and industrial occupational health and safety risks? • Is there potential for hazardous work conditions that may expose workers to unsafe practices or exposure to hazardous substances or conditions? Is there potential for employment of community workers?
Resource Efficiency and Pollution Prevention and Management	• To promote the sustainable use of resources, including energy, water and raw materials • To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities • To avoid or minimize project-related emissions of short and long-lived climate pollutants • To avoid or minimize generation of hazardous and non-hazardous waste • To minimize and manage the risks and impacts associated with pesticide use.	• Will the project result in the generation of significant emissions and wastes that if not properly treated or disposed of could cause impacts to the environment and to local communities? • Is there a risk of pollution generation and/or excessive consumption of finite resources associated with project-related economic activities? • Risks and impacts on quality and availability of energy, water, and raw materials and associated social conflict risks?
	• To anticipate and avoid adverse impact on the health and safety of project affected communities during the project life cycle from both routine and nonroutine circumstances.	• Will the Project result in potential traffic and road safety risks to workers, affected communities and road users throughout the project life cycle?

ESS	Objectives	Key questions
Community health and Safety	• To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dam. • To avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials. • To have in place effective measures to address emergency events. • To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.	• And risk of exposure to communicable diseases, particularly those related to labor and population influx (e.g. Gender Based Violence) • Does the Project involve a potential for community exposure to water-borne, water based, water-related and vector-borne diseases? • Could the project exposure communities to emergency events or hazards that involve health or safety risks? • Is there potential for the employment of private or government security forces?
Indigenous Peoples	• To ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples. • To avoid adverse impacts of projects on indigenous Peoples or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts. • To promote sustainable development benefits and opportunities for Indigenous Peoples in a manner that is accessible, culturally appropriate and inclusive. • To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the Indigenous People affected by a project throughout the project's life cycle. • To obtain the Free, Prior, and Informed Consent (FPIC) of affected Indigenous Peoples in the three circumstances described in the ESS.	• Are there Indigenous Peoples present, attached to the project area? • Which groups and what are their most relevant social, cultural and economic features? • Will the project results in impacts on their human rights, dignity, aspirations, identity, culture? • Will the project result in impacts on lands and natural resources subject to traditional ownership or under customary use or occupation? • Will the project result in the relocation of Indigenous Peoples from communally held or attached land and natural resources subject to traditional ownership or customary use or occupation?

ESS	Objectives	Key questions
	• To recognize, respect and preserve the culture, knowledge, and practices of Indigenous People, and to provide them with an opportunity to adapt to changing conditions in a manner and in a timeframe acceptable to them.	
Stakeholder Engagement and Information Disclosure	• To establish a systematic approach to stakeholder engagement that will help borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties. • To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance. • To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them. • To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format. • To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow borrowers to respond to and manage such grievances.	• Has the Borrower undertaken stakeholder engagement during project preparation? • Who is affected by the project, and who has an interest that can influence outcomes? • How will the project engage with them? • How should consultation events be organized? • How can stakeholders seek remedy if they feel the project is causing harm to them or the environment? *What are the mechanisms established to document and disclose relevant project information?

A.6.2 Environment and Social Standards

Environment and Social Standards 1: Assessment and Management of Environmental and Social Risks and Impacts

At the initial stage of a proposed World Bank supported project, the client will work to apply the objectives and approaches of the Assessment and Management of Environmental and Social Risks and Impacts to the project. The client will conduct an environment and social assessment to evaluate the project's potential environmental and social risks and impacts examine project alternatives; identify ways of improving project selection, siting, planning design and implementation in order to apply the mitigation measures for adverse environmental and social impacts and seek opportunities to enhance the positive impacts of the project. The assessment will be conducted at the scale and level of detail appropriate to the potential risks and impacts. The project would need to take into account the existing government environmental and social framework in the assessment, development and implementation of a project. These include the OBEC's school infrastructure standards and other related laws, regulations and guidelines concerning school design and operation e.g. School Environmental Sanitation Manual (the Ministry of Public Health, MOPH), School Food Sanitation Manual (MOPH), Building Control Act and regulations, School Safe Environment Manual, etc.

The assessment will take into account all project social and environmental risks including:

a) Environmental risks and impacts, including:

   a. Those defined by the World Bank Group Environmental, Health and Safety Guidelines (EHSGs);

   b. Those related to community safety;

   c. Those related to climate change and other transboundary or global risks and impact;

b) Social risks and impacts, including:

   a. Threats to human security through the escalation of personal, communal or inter-state conflict, crime or violence;

   b. Risks that project impacts fall disproportionately on individuals and groups who, because of their particular circumstances, maybe disadvantaged or vulnerable;

   c. Any prejudice or discrimination toward individuals or groups in providing access to development resources and project benefits, particularly in the case of those who may be disadvantaged or vulnerable;

   d. Negative economic and social impacts relating to the involuntary taking of land use;

   e. Risks or impacts associated with land.

For re-organization of school networks, the potential social risks and impacts toward different stakeholders are not as straight forward and not easily mitigate. Potential social risks and impacts have already been mentioned in the introduction section and in screening of risks and identifying possible mitigation measures in table 6.1. The advisory note suggests that at the initial stage of the pilot

preparation where the location of the pilot project is unknown, the OBEC conducts a social impact assessment (SIA) with the objectives to: i) identify key issues, risks, impacts, and recommendations on the proposed pilot project from stakeholders; ii) define mitigation measures and benefits enhancement measures for the general design and implementation of the proposed project.

Indicative outline of the social impact assessment

1. **Project description**: This section provides a description of proposed activities and their environmental, social context, including description of project location and impacted areas.
2. **Legal and institutional framework**. This section provides information of relevant legal and institutional framework such as the national laws, policies, regulations such as the Ministry of Education's regulation on School Closing, Consolidating of 2550.
3. **Stakeholder analysis and social baseline data**: this section provides information with regard to:
   a. Which communities are present in the project area of impact and influence
   b. Who are the project-affected and interested group (stakeholder identification and analysis - mapping)
   c. Social baseline should be concise and focused. It should include key aspects: socio-demographic, cultural and economic conditions, poverty and social vulnerability, and institutional capacity.
   d. Information about the public consultations to understand different stakeholders' expectations about the project and its activities, their concerns and recommendations. (with documentation of participants of the consultations)
   e. Key indicators for monitor and evaluation.
   f. Identify sources of information whether it is from primary or secondary source and data, as well as any data or information gaps
4. **Expected social impacts and social risks**: This section provides the information with regard to impacts and risks as well as the assessments of positive and negative impacts, and identification and assessment of vulnerable and disadvantaged groups who may face disproportionately high negative impacts or challenges in receiving project benefits. Key issues should include accessibility/affordability of students in remote areas as well as vulnerable and special needs groups. In the areas where ethnic minority groups reside, key issues should also include accessibility, socio-economic conditions and cultural appropriate measures for ethnic students.
5. **Mitigation and enhancement measures**: The social mitigation and benefit enhancement measures should be clearly defined. These mitigation and enhancement measures should directly linked/responded to social risks and impacts, and recommendations gathered from the consultations.
6. **Analysis of alternatives and design measures**: This section should provide measures and plans to reduce, mitigate and/or offset adverse risks and impacts, and enhance positive benefits, provisions for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project risks and impacts including on its capacity to manage environmental and social risks and impacts.

Once the pilot project has identified the locations of all participating schools, the OBEC staff at the provincial level and the associated "hub" school administrators would need to conduct social screening on the potential risks along the lines of the risks and impacts identified under the social impact assessment mentioned above, and develop a site specific plan that provides the information on how the pilot project will manage the risks and impacts gathered from the social screening and assessment.

Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure

The social assessment will include stakeholder engagement and information disclosure process as an integral part of the assessment. Stakeholder engagement is an inclusive process conducted throughout the project life cycle. The objectives of the stakeholder engagement are to:

- Establish a systematic approach to stakeholder engagement that will help the project identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.
- Assess the level of stakeholder interest and support for the project and to enable stakeholders' view to be taken into account in project design and environmental and social performance.
- Promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them
- Ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.
- Provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow the project to respond to and manage such grievance.

Stakeholder Identification and Analysis

Stakeholder engagement is a key part of the project preparation and implementation process since it can improve the environmental and social sustainability of projects, enhance its acceptance, and make a significant contribution to the success of a project throughout the project cycle. For school consolidation, there is a potential resistance from local stakeholders. It is very important that the engagement process focuses more on meaningful stakeholder participation. The nature, scope and frequency of stakeholder engagement must be proportionate to the nature and scale of the project, and its potential risks and impacts.

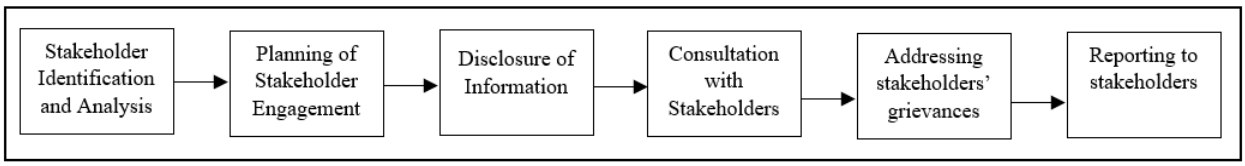
With regard to the proposed pilot project, the Ministry of Education's Regulation on the Establishment, Consolidation and Abolishment of Primary Schools 2550 requires that the proposed pilot project (OBEC) conducts consultation to gather inputs and recommendations from parents and communities. It is recommended that stakeholders that need to be consulted throughout the project's life cycle would be beyond just parents and communities. The client (OBEC) will be responsible to engage during project design and implementation two key groups of stakeholders:

- **Project-affected parties.** Individual, groups, local communities and other stakeholders who are affected or likely to be (directly or indirectly) affected by the project, positively or negatively, and

- **Interested parties.** Individual or groups who may be interested in the project because of its location, its proximity to natural or other resources, or because of the sector or parties involved in the project. Depending on the nature and scope of the project and its potential risks and impacts, these may be local government officials, community leaders, and civil society organizations, particularly those who work in or with the affected communities. While these groups may not be directly affected by the project, they may have a role in the project preparation (for example, government permitting) or be in a community affected by the project and have a broader concern than their individual household.

Stakeholder engagement must be inclusive, making sure that in the participatory process disadvantaged or vulnerable individual or groups are reached and properly consulted. This is important because such groups are more likely to be excluded from/unable to participate fully in the mainstream consultation process, so they may require specific measures and/or assistance to do so. Special provisions are included for specific impacts caused to Indigenous Peoples. Additionally, inclusiveness of the stakeholder engagement process has to do with ensuring the participation of women, youth and elderly, disable people, minority ethnic and/or linguistic groups, sexual orientation and gender identity (SOGI) minorities, etc.

As stated in the ESS10, a typical stakeholder engagement process under the WB's ESF involve the following six main steps. Stakeholder identification and analysis is its initial step:



The stakeholder identification process is done as soon as possible at the project's preparation stage. The clients must identify the different stakeholders, both project-affected parties and other interested parties.

Stakeholder identification can be done in different ways. Common methodologies used when doing stakeholder identification are:

- Apply stakeholder's identification tools: brainstorming, mind maps, social network analysis, issue-based identification, impact zoning, etc.,
- Outreach from other actors,
- Local knowledge from community-level informants,
- Assessment undertaken by independent third party specialists (consultants).

The level of granularity (disaggregation) of stakeholder categories will depend on the characteristics of the project. It is important to make sure that a wide range of interest-groups are identified, and that all the different points of view are included. This initial identification and analysis will help to define

the first summary of project stakeholder needs, to be updated during the project's design and implementation.

When doing the stakeholder analysis, it is important to specifically identify which of those project- affected parties may be disadvantaged or vulnerable. The following can help outline an approach to understand the viewpoints of these groups:

- Identify vulnerable or disadvantaged individuals or groups and the limitations they may have in participating and/or in understanding the project information or participating in the consultation process.
- What might prevent these individuals or groups from participating in the planned process? (For example, language differences, lack of transportation to events, accessibility of venues, disability, lack of understanding of a consultation process).
- How do they normally get information about the community, projects, activities?
- Do they have limitations about time of day or location for public consultation?
- What additional support or resources might be needed to enable these people to participate in the consultation process?
- If there are no organizations active in the project area that work with vulnerable groups, such as persons with disability, contact medical providers, who may be more aware of marginalized groups and how best to communicate with them.
- What recent engagement has the project had with vulnerable stakeholders and their representatives?

Stakeholder Engagement Plan (SEP)[41] The stakeholder analysis and the proposed stakeholder engagement activities are usually included in the project's Stakeholder Engagement Plan (SEP). The SEP should focus particularly on those directly and adversely affected by project activities. Mapping the impact zones by placing the affected communities within a geographic area can help define or refine the project's area of influence. The SEP should identify others who think they may be affected, and who will need additional information to understand the limits of project impacts.

The project should develop the stakeholder engagement plan at an early stage of the project preparation. The SEP will describe the timing and methods of engagement with stakeholders throughout the project life cycle. The plan should distinguish between project affected parties and other interested parties. It will also describe the range and timing of information to be communicated to project affected parties and other interested parties, the type of information to be sought from them, and how communication with stakeholders will be handled throughout the project preparation and implementation.

Information disclosure. The project will disclose project information to allow stakeholders to understand the risks and impacts of the project, and potential opportunities. The project will be disclosed in relevant local

[41] Please find more information on the template for ESS10: Stakeholder Engagement and Information Disclosure Stakeholder Engagement Plan and Stakeholder Engagement Framework, World Bank 2018 at http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf#page=111&zoom=80

languages and in a manner that is accessible and culturally appropriate, taking into account any specific needs of groups that may be differentially or disproportionately affected by the project or groups or the population with specific information needs (such as, disability, literacy, gender, mobility, differences in language or accessibility).

Different **communication methods** should be used to reach the majority of stakeholders. The project should select those that are most appropriate and have a clear rationale for their choices. The plan should include a statement welcoming comments on the proposed engagement plan and suggestions for improvement. For remote stakeholders, it may be necessary to provide for an additional newspaper outlet or separate meeting, or additional documents that should be placed in the public domain. The public domain includes: Newspapers, posters, radio, television; Information centers and exhibitions or other visual displays; Brochures, leaflets, posters, nontechnical summary documents and reports; Official correspondence, meetings; and Website, social media.

Meaningful consultation. The project will undertake a process of meaningful consultation in a manner that provides stakeholders with opportunities to express their views on project risks, impacts and mitigation measures, and allows the project to consider and respond to them. Meaningful consultation will be carried out on an ongoing basis as the nature of issues, impacts and opportunities evolves.

Meaningful consultation is a two-way process that:

a) Begins early in the project planning process to gather initial views on the project proposal and inform project design;

b) Encourages stakeholder feedback, particularly as a way of informing project design and engagement by stakeholders in the identification and mitigation of environment and social risks and impacts.

c) Continues on an ongoing basis, as risks and impacts arise;

d) Is based on the prior disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information in a timeframe that enables meaningful consultation with stakeholders in a culturally appropriate format, in relevant local languages and is understandable to stakeholders.

e) Considers and responds to feedback;

f) Supports active and inclusive engagement with project-affected parties;

g) Supports active and inclusive engagement with project-affected parties;

h) Is free of external manipulation, interference, coercion, discrimination and intimidation; and

i) Is documented and disclosed by the project.

Grievance Mechanism[42]. In order for the project to gather input as well as respond to concerns and grievance of the project-affected parties in the timely manner, the project must establish or use the existing grievance

[42] Please find more information on the grievance redress mechanism checklist accompany the Guidance Note for ESS10 at http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf#page=111&zoom=80

redress mechanisms such as the community justice or Damrongthama center at the district and provincial levels. In principle, the grievance mechanism is expected to address concerns promptly and effectively, in a transparent manner that is culturally appropriate and readily accessible to all project-affected parties. The project will inform the project-affected parties about the grievance process in the course of its community engagement activities and will make publicly available a record documenting the responses to all grievances received; and the handling of grievances will be done in a culturally appropriate manner and be discreet, objective, sensitive and responsive to the needs and concerns of the project affected parties.

The grievance mechanism may include the following:

- Different ways in which users can submit their grievances, which may include submissions in person, by phone, text message, mail, email or website.
- A log where grievances are registered in writing and maintained as a database.
- Publicly advertised procedures, setting out the length of time users can expect to wait for acknowledgement, response and resolution of their grievances.
- Transparency about the grievance procedure, governing structure and decision makers; and
- An appeal process to which unsatisfied grievances may be referred when resolution of grievance has not been achieved.

The OBEC will have to define clear roles, responsibilities and authority as well as designate specific personnel to be responsible for the implementation and monitoring of stakeholder engagement activities including the grievance redress mechanisms that the pilot project will be established.

Environment and Social Standards 7: Indigenous Peoples[43]

The government does not have specific scope and areas where the pilot project will be implemented. Officially, there are 56 ethnic minority groups residing in several areas in Thailand. The Ministry of Social Development and Human Security is overseeing the Masterplan for the Development of Ethnic Groups in Thailand. With regard to school consolidation, some potential concerns could include: limited access to project information for ethnic parents; limited grievance mechanisms; Parents not supporting education participation for fear that their children would potentially not speak their ethnic language and follow their ethnic culture and identity; Ethnic community leaders not supporting education participation for fear that values and practices of local agricultural and traditional healing would not be included in the school curriculum; Teachers are not ethnic natives and thus are challenged to communicate with students; Students at smaller remote area schools find it difficult to commute to larger consolidated school hubs. In case that there are indigenous peoples or ethnic groups residing in the proposed project areas, the pilot project will need to make sure that ethnic groups in the pilot project area is fully consulted about, and have opportunities to actively participate in, project design and the determination of project implementation arrangements.

It is expected that an ethnic group consultation strategy will be developed as part of the stakeholder engagement plan (SEP) to ensure that ethnic groups present in, or with collective attachment to, the project area are fully consulted about and have opportunities to actively participate in project design and the determination of implementation arrangements. Consultations with ethnic groups and communities should include issues related to students' accessibility, affordability, socio-economic conditions and cultural appropriate measured for ethnic groups. In addition, the consultations should obtain feedback on the criteria, school consolidation process and methodology and options before the criteria and methodology are finalized. This strategy, as part of the stakeholder engagement plan, should be implemented prior to the selection of participating schools in order to inform decision- making.

The objectives of this standard are to:

- Ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resources-based livelihoods of indigenous people.
- Avoid adverse impacts of projects on indigenous people or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts.
- Promote sustainable development benefits and opportunities for indigenous people in a manner that is accessible, culturally appropriate and inclusive
- Improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the indigenous people affected by a project throughout the project's life cycle.
- Obtain the Free, Prior, and informed consent (FPIC) of affected indigenous people.
- Recognize, respect and preserve the culture, knowledge, and practices of indigenous people, and to provide them with an opportunity to adapt to changing conditions in a manner and in a

[43] Please find more information on Indigenous Peoples at http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf#page=89&zoom=80

timeframe acceptable to them.

The scope and scale of consultation, as well as subsequent project planning and documentation processes, will be proportionate to the scope and scale of potential project risks and impacts as they may affect indigenous people. The process for meaningful consultation for this particular populations will include:

a) Involve indigenous people' representative bodies and organizations (e.g., councils of elders or village councils, or chieftains) and, where appropriate, other community members;
b) Provide sufficient time for indigenous people's decision-making processes; and
c) Allow for indigenous people' effective participation in the design of project activities or mitigation measures that could potentially affect them either positively or negatively.

Indigenous people under this standard refers to as a distinct social and cultural group possessing the following characteristics:

a) Self-identification as members of a distinct indigenous social and cultural group and recognition of this identity by others; and
b) Collective attachment to geographically distinct habitats, ancestral territories, or areas of seasonal use or occupation, as well as to the natural resources in these areas; and
c) Customary cultural, economic, social or political institutions that are distinct or separate from those of the mainstream society or culture; and
d) A distinct language or dialect, often different from the official language of languages of the country or region in which they reside.

Infrastructure related activities and ESSs

There are many methods to assess the environmental and social risks and impacts. As for the proposed pilot project, where potential environmental risks and impacts caused by civil works required for merging small schools with hub schools are expected to be moderate. These civil works may involve rehabilitation/repair/upgrade of existing school buildings or facilities which the project will focus on small and non-small schools. Potential environmental impacts from these typical civil works may be derived primarily from dust, noise and vibration and wastewater from construction activities, generation of construction and domestic waste, limited site clearance for new construction, student and teacher safety during construction /rehabilitation and transportation of equipment, worker health and safety from construction, worker sanitation, use of construction materials, etc. These impacts are expected to be site-specific, happen in short-term and can be easily mitigated by implementation of readily available mitigation measures.

It is expected that most of the environmental impacts generated from school rehabilitations/ upgrades could be managed by application of an Environmental Codes of Practice (ECOP) that will provide guidance for management of these potential typical impacts during construction. Since specific sites for pilot project will be identified at later stage and site-specific activities within the defined scope will be identified after selection of schools, it is suggested that an Environmental and Social Management Framework (ESMF) is prepared by the government to describe how site-specific locations will be screened for environmental and social risk and management action developed. The ESMF will also describe how the various ESF requirements are incorporated in the existing FSQL standards taking into account the existing government

framework on school infrastructure design and management. Existing government framework on environmental and social assessment, development and implementation of the project as well as international good practices e.g. WBG Environmental and Social Framework (ESF) and WBG Environmental, Social and Health Guidelines, etc. should be considered in the preparation of ESMF. The ESMF should include an Environmental Code of Practice (ECOP) that would form part of bidding document and contract for civil works. It provides guideline to manage impacts from rehabilitation /repair / upgrade of school buildings and facilities and construction of small buildings. An indicative outline of the ESMF and ECOP outline and example are provided in the following section:

Indicative Outline of the ESMF

1. Executive Summary
2. Introduction
3. Objective of the ESMF
4. Project Description and locations
5. Existing Government Regulatory Frameworks on Environmental and Social Assessment and management relevant to the project
6. International Standards, Good Practices on Environmental and Social Assessment and management relevant to project including WBG ESF and WBG ESH Guidelines
7. A brief discussion on the project environmental and social impacts and mitigation measures
8. Guidelines for site-specific environmental and social risks screening and development of management actions
9. Monitoring and Reporting
10. Responsibilities for ESMF Implementation
11. Consultation and Disclosure
12. Capacity Building and Training

Annexes (The following are likely annexes to an ESMF)

- General Site-Specific Environmental and Social Impacts Screening Check list
- Environmental Codes of Practices (ECOP) for school rehabilitation/upgrade/small new construction (an indicative outline of an ECOP is presented in the following section)
- Site Supervision Check list for ECOP
- Consultation Records

Indicative Outline and Example of ECOP for school rehabilitation/upgrade/construction of new classroom

1. Introduction: This section describes a summary of project activities and its impacts that leads to

the preparation of the ECOP.

2. Objectives: This section describes objective of ECOP.

For example, This ECOP is prepared to manage environmental and social impacts from school rehabilitation/upgrade/construction of new classroom for pilot project of school network consolidation. The ECOP will be a mandatory part of bidding and later construction contract documents so that the contractor complies with environmental and social covenants.

3. Responsibilities:

The ECOP should also indicate responsibility for ECOP monitoring and reporting. This section provides information on responsibilities of Equitable Education Fund (EEF) and the Office of the Basic Education Commission (OBEC), targeted school and contractor for implementation and monitoring of the ECOP.

4. Potential risk and proposed mitigation measure for school rehabilitation/upgrade/ construction of new classroom

Examples of typical impacts and mitigation measures for small-scale civil works

ISSUES/RISKS	MITIGATION MEASURE
1) Dust generation/ Air pollution	• The Contractor implements dust control measures to ensure that the generation of dust is minimized and is not perceived as a nuisance by student or school staff, maintain a safe working environment, such as: - Establish a petition to close working area for dust control at the renovation site; - Use masks when staying and working in the area; and - Water (if necessary, to avoid dusk generation).

ISSUES/RISKS	MITIGATION MEASURE
	• Do not burn site clearance debris or construction waste materials. • Keep stockpile of aggregate materials covered to avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals. • Limit vehicle speed when passing through community area and within school premise.
2) Noise and vibration	• Avoid exceeding noise emission from poorly maintained machines. • Use earplugs when staying and/or working with the noisily machineries. • Minimize construction materials transportation through community areas, where possible.
3) Solid waste	• At all places of work, the Contractor shall provide adequate litter bins, containers and refuse collection facilities. • Only dispose wastes in the government approved disposal site. • No burning, on-site burying or dumping of solid waste shall occur. • Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc. shall be collected and separated on-site from other waste sources for reuse, for use as fill, or for sale. • Maintain waste (including earth dug for foundations) at least 300 metres from rivers, streams, lakes and wetlands • Use secured area for refuelling and transfer of other toxic fluids away from drainage structures and water bodies; ideally on a hard/non-porous surface • Train workers on correct transfer and handling of fuels and other substances and require the use of appropriate protective equipment e.g. gloves, boots, aprons, eyewear, etc. • Collect and properly dispose of small maintenance materials such as oily rags, oil filters, used oil, etc. Never dispose spent oils on the ground and in water courses as it can contaminate soil and groundwater (including drinking water aquifer).
4) Increased soil erosion/landslides during and after construction	• Proper design and layout of furrows or field avoiding a too steep gradient • Land leveling • Install and maintain an adequate drainage system to prevent erosion on the site during and after construction • Erect erosion control barriers around perimeter of cuts, disposal pits, and roadways

ISSUES/RISKS	MITIGATION MEASURE
	• Maintain vegetation cover, where possible
5) Obstruct or cause poor water drainage	• Install and maintain an adequate temporary drainage system • Ensure culverts are suitably designed to minimize effects on hydrology.
5) Removal of tree/vegetation/green areas	• Try to avoid/minimize site clearance and removal of tree/vegetation as possible • When tree removal is unavoidable, Re-plantation after construction completion to compensate lost
7) Interruption of utility services	• Provide information to school management on working schedules as well as planned disruptions of water/power at least 2 days in advance. • Any damages to existing utility systems shall be reported to authorities and repaired as soon as possible.
8) Worker health, safety and sanitation	• Training workers on occupational safety regulations and provide sufficient protective clothing for workers in accordance with applicable national laws. • Ensure workers use proper Personal Protected Equipment (PPE) at all time while working. • Ensure adequate toilet facilities for workers. • Each construction site has a basic first-aid kit with bandages, antibiotic cream, etc.
9) Community Health and Safety (Student and school staff and nearby communities)	• Install fences, barriers, dangerous warning/prohibition site around the construction area which showing potential danger to student and school staff. • Fill in all earth borrow-pits once construction is completed to avoid standing water, water-borne diseases and possible drowning.
10) Chance Find Procedure for Physical Cultural Heritage	In case culturally valuable materials are uncovered during excavation, the following Chance Find Procedures shall be followed: • Stop work immediately following the discovery of any materials with possible archeological, historical, paleontological, or other cultural value, announce findings to School management representative who will then notify relevant authorities; • Protect artifacts as well as possible using plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artifacts; • Prevent and penalize any unauthorized access to the artifacts; and • Restart construction works only upon the authorization by relevant authorities.

ISSUES/RISKS	MITIGATION MEASURE
Others	• No hunting, fishing, capture of wildlife or collection of plants • No use of unapproved toxic materials including lead-based paints, un-bonded asbestos, etc.

The proposed pilot project is expecting to conduct some infrastructure to ensure that the schools' infrastructure and facilities have minimum standards according to FSQL. Although civil work activities are not expected to create much environmental and social impact, the proposed project should consider applying the Environment and Social Standards 2 and 4 to ensure that all infrastructure and transport related activities associated with the proposed pilot projects will no do harm to the project-affected people especially to the students, teachers, communities especially to vulnerable populations, as well as different types of workers.

Environment and Social Standard 2: Labor and Working Conditions[44]

Because the proposed pilot project will involve the hiring of teachers and staff for participating schools, as well as hiring labors to improve schools' infrastructures, this standard on Labor and Working Conditions covers worker-management relationships and the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. Key objectives of this standard are to:

- Promote safety and health at work
- Promote the fair treatment, nondiscrimination and equal opportunity of project workers.
- Protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this standard) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate.
- Prevent the use of all forms of forced labor and child labor
- Support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law
- Provide project workers with accessible means to raise workplace concerns. Under this standard, there are four types of project workers:

a. Direct workers. People employed or engaged directly by the project to work specifically in relation to the project.
b. Contract workers. People employed or engaged through third parties to perform work related to core functions of the project, regardless of location.
c. Primary supply workers. People employed or engaged by the project's primary suppliers.
d. Community workers. People employed or engaged in providing community labor.

This standard requires that the project develops and implements written **labor management**

[44] Please see template for Labor Management Procedures at http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf#page=45&zoom=80

procedures (LMP) which set out the way in which different type of project workers, depending on the project context, will be managed in accordance with the requirements of national law and the environment and social standards.

Environment and Social Standard 3: Resource Efficiency and Pollution Prevention and Management[45]

Project activities that are involve civil works i.e. school rehabilitation/upgrade/building of new classrooms and supporting facilities would generate pollution from construction (dust, noise, wastewater, solid wastes, etc.). During operations period, increased number of student and teacher in Hub school could also lead to an increasing amount of wastewater and wastes and demand for energy and water. The objectives of this standards are to:

- To promote the sustainable use of resources, including energy, water and raw materials
- To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities
- To avoid or minimize project-related emissions of short and long-lived climate pollutants
- To avoid or minimize generation of hazardous and non-hazardous waste
- To minimize and manage the risks and impacts associated with pesticide use.

Potential impacts during construction phase e.g. noise, dust, construction wastes and wastewater from school rehabilitation/upgrade and impacts during school operation due to increasing number of students in hub schools are expected to be moderate and able to be managed according to available codes of practice. An ECOP will include mitigation measures for school rehabilitation/upgrade. FSQL standards will be updated to include relevant requirements in the ESF including pollution management and efficient use of resources (water, energy, etc.).

Environment and Social Standards 4: Community Health and Safety[46]

For all the activities related to civil works and transportation (project-related traffic and road safety risks and hazardous materials), the project needs to evaluate the risks and impacts on health and safety of the affected communities during the project life cycle and propose mitigation measures. The objectives of this ESS are to:

- To anticipate and avoid adverse impact on the health and safety of project affected

[45] Please find more information on Resource Efficiency and Pollution Prevention and Management at http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf#page=53&zoom=80

[46] Please find more information on Community Health and Safety at http://pubdocs.worldbank.org/en/837721522762050108/Environmental-and-Social-Framework.pdf#page=59&zoom=80

communities during the project life cycle from both routine and nonroutine circumstances.

- To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dam.
- To avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials.
- To have in place effective measures to address emergency events.
- To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.

It is expected that the environmental and social risks arising from civil work and transportation under the proposed pilot project will be able to minimize/avoid by using the environmental code of practice (ECOP) on different issues and by social management plan developed in response to the social risks and impacts identified by the social impact assessment. Please see information in the standard 1.

A.6.3 Gender aspects[47].

The school reorganization is an opportunity to promote gender equality and help close gaps between men and women, girls and boys, and enhance women's leadership and voice. For the proposed pilot project, the suggested social assessment should identify and differentiate gender impacts of the project activities and find appropriate and culturally sensitive or gender-sensitive measures to address those impacts. For example, the social assessment should conduct separate consultations between male and female teachers to understand their expectations, concerns, needs and recommendations for the design and mitigation measures of the proposed project. The assessment should also understand whether parents have any concerns about the safety of their children especially young girls who travel to the new schools or their safety during school construction. Employment of teachers, staff and labor under the proposed project should ensure gender equality. Men and women should have the same opportunities for employment and treatment. All mitigation measures as well as benefit enhancement measures should integrate gender aspects. The assessment, consultation and planned monitoring and evaluation should document gender disaggregated data to inform understanding and learning of the pilot with regard to gender.

Grievance redress mechanisms should be set up in a way that is easily accessible by women. For the proposed pilot project, although the project does not expect to have major civil works that could raise concerns regarding sexual exploitation and abuse (SEA)and sexual harassment (SH)from the project construction, it is important that the grievance redress mechanisms have a good process and procedures to receive and facilitate resolution of concerns and grievances of project-affected parties

[47] Good Practice Note: Environmental & Social Framework for IPF Operations, Gender, The World Bank Group, October 2019

as well as gender-based violence (GBV) /SEA (adequate structures to handle allegations of SEA/SH) when and where applicable[48].

A.6.4 Institutional Capacity and Implementing Arrangements for E&S management

The Ministry of Education has prepared for consolidation by issuing the Ministry's regulation 2550 to guide some of the implementation of the policy, including the requirement for the project to organize public hearings with parents and communities. However, the Ministry of Education has not yet conducted social impact assessment for the design and preparation of the project. The Ministry of Education does not have existing knowledge and experience in social and environmental management.

The Office of the Basic Education Commission would be responsible for the implementation of the proposed school consolidation. OBEC has limited knowledge and experience with regard to managing the environmental and social aspects of the project and no exposure to the World Bank Environmental and Social Framework. OBEC would need to ensure that it has adequate capacity in place to identify potential risks and impacts and to prepare and implement mitigation measures effectively for the project. This advisory note would recommend that OBEC recruits competent consultant(s) to assist with the preparation of any environmental and social assessment and measures that would be applied to the pilot project. The work of the consulting firm would need to be coordinated by a trained ESF focal point member of OBEC and reporting directly to senior management of the Ministry of Education.

For the contexts associated with the consolidation of schools proposed under this advisory service, the advisory note has identified activities which are both infrastructure related and non-infrastructure related. The FSQL committee and sub-committees will have responsibility in the establishment of minimum standards for school infrastructure and facilities that would be constructed including Life and Fire Safety. There will be no land acquisition, restriction on land use and involuntary resettlement as all the expected civil works will be within the existing public schools' premises. The committee will also be responsible for the establishment of minimum standards for teaching and learning materials, personnel quality and management, and school-based management including measures to ensure inclusion and benefits of project affected populations

[48] For further information, please see the World Bank Interim Technical Note: Grievance Redress Mechanism for Sexual Exploitation and Abuse & Sexual Harassment in World Bank-financed Project, April 2020.

7. Evaluating the Impacts of the School Upgrading Intervention

This chapter constitutes a guidance note for evaluating the impacts of the proposed FSQL school upgrading intervention (see Chapter 5 on the proposed list of FSQL standards) in pilot areas on learning outcomes and other important key performance indicators. In particular, the note describes the key performance indicators to be evaluated, the important variables that will be used (and collected) to evaluate the impacts of the FSQL program on the indicators, the process for selecting the treatment and the control schools, the impact identification strategy, and the appropriate sample size for each group.

Three broad aspects of the policy intervention will be evaluated at the individual student level:

1. The impact on students' schooling outcomes from upgrading "Protected" schools to meet the required FSQL standards
2. The impact on schooling outcomes of "displaced" students who will be relocated from closed down "Affiliated" schools to expanding "Hub" schools, which will be upgraded to meet the standards
3. The impact on schooling outcomes of "receiving" students in expanding Hub schools, which will be upgraded to meet the standards

In addition to assessing the impacts of the intervention, it is also very important to put in place a "process monitoring" strategy during the pilot stage: that is, to put in place a way to capture the "story" of how a particular geographical area managed to consolidate its school network. Was it a charismatic major that did the difference? What was the dynamics at town hall meetings? What messages delivered (and by whom) appear to have made a difference? Given the size of the challenge Thailand faces, it will need to have in place a way to systematically learn from the places that move forward vs. those that get stuck.

7.1. Program Impact Evaluation Design

Consider an impact evaluation design for Intervention 1 – The impact on students' schooling outcomes from upgrading "Protected" schools to meet the FSQL standards. Clearly, the interventions will be at the school level, where two groups of Protected schools will be exposed to two different "treatments" as follows:

(i) Control group $(T = 0)$ – Protected schools which have not and will not be upgraded to attain FSQL standards during the evaluation period (3 years)
(ii) Treatment group $(T = 1)$: Protected schools which have been selected in the pilot to be upgraded to attain the standards at year $t = 0$

It is important to note that even though the intervention will be at the school level, the outcomes will be evaluated at the individual student level in each school. Furthermore, if the treatment intervention were to be assigned randomly to schools, simple differencing of post-intervention average outcomes between the treatment and the control groups would yield the desired "unbiased" average treatment (or causal) effect of the intervention. However, the assignment of the intervention will likely be based

on the schools and communities which indicate strong willingness and commitment to the program concept. Therefore, the impact evaluation design considered in this chapter is "quasi-experimental" since it is anticipated that the assignment of treatment will be non-random.

7.1.1. Identification Strategy

The principal econometric problem in the estimation of such treatment effect is "selection bias", which arises from the fact that the treated schools differ from the control schools for reasons other than treatment status per se. An appropriate impact evaluation design has to take this non-random treatment assignment into account. Ideally, for each treatment school, we want to find as its control, an otherwise identical school which has not been exposed to the treatment (We want to compare apples with apples!).

Unfortunately, it is impossible to observe the outcome values under both the treatment and the control conditions on the same school. The key to obtaining an "unbiased" average treatment effect on the treated (ATT) is in constructing an appropriate control or "counterfactual" for each treatment school.

This impact evaluation employs an identification strategy known as "selection on observables" designs. The designs are based on a key (and very strong) underlying assumption that the treatment assignment is "as good as random" after conditioning on a set of observable covariates. In other words, to the extent that there is systematic selection into treatment, the designs assume that the selection is only a function of the observable covariates. Hence, if the effects of these observable variables on the probability of selection into treatment can be controlled for, then the causal effect of the treatment can be consistently estimated.

There are a variety of estimation techniques available under these selection-on-observables designs, but this guidance note discusses only the "matching" estimator since the concept is probably the easiest to explain. The idea behind matching is to compare treated schools to control schools which have similar values of predetermined covariates X, where the vector X contains all observable factors which affect selection into the treatment and are correlated with potential outcomes. This guarantees that every treatment-control comparison is performed on schools with very similar values of X. Given the selection on observables assumption, the treatment is as good as randomly assigned after conditioning on X.

Note that for every treated school, a "counterfactual" or "comparison school" can be a single control school or a composite (i.e., a weighted average) of several different control schools which have similar values of X. From observing the school-level data from OBEC, we expect to use the set of observable variables which have been used in Section 2.2 to classify schools into 4 clusters. These variables are: i) Total students enrolled; ii) Total teachers; iii) Teacher-to-class ratio; iv) Share of teachers with higher than bachelor degree qualification; v) Share of assistant teachers; vi) Share of teachers with professional ranking or higher; vii) Principal has master's degree qualification or higher; viii) Principal has expert ranking or higher; and ix) Principal missing. Additionally, we will be conditioning on the socioeconomic background variables of the student body (i.e. share of poor and very poor students in the school) and the average grade 6 mathematics, science, and Thai language scores in the Ordinary National Education Test (ONET) from the previous year.

Once the treatment schools have been identified, we will then employ the matching algorithm to select the appropriate control schools.

7.1.2. Strategy for Obtaining Key Performance Outcome Indicators

Some of the key performance outcome indicators which will be used to evaluate the program impact are the student Grade 6 scores in the ONET math, science, and Thai language exams. Another potential performance indicator to be considered is school dropout.

In the first round of impact evaluation, we will be following a sample from a cohort of students from the time they enter Grade 6 and right after the policy has been fully implemented (i.e., the Protected schools have been upgraded). This first cohort of affected students would then be exposed to the new school environment for one full academic year by the end of their primary schooling.

It is advisable that at least 3 rounds of evaluation be carried out since changes in school environment may have adverse effects on student achievement in the short run due to disruption effects. In this case, we would also want to follow cohorts of students entering Grade 5 and Grade 4 from the time the policy has been fully implemented until the time they reach the end of Grade 6 (the second and third round of end-line evaluations).

7.2. Sampling and Power Analysis

The sampling framework is designed to mimic a block randomization process, where each treatment-comparison pair of schools will be selected from the same district. Recall from Section 3.2 that the average enrolment size for the 1,155 Protected schools is only 78. Therefore, for Intervention 1, we can expect to follow no more than between $n = 10 - 15$ randomly selected students in each of the three grades of interest in each school since the Protected schools are very small.

Suppose that we would like to be able detect a standardized effect size of the impact, which is the effect size expressed in terms of a normal distribution with mean 0 and standard deviation 1, of between $\delta = 0.2 - 0.3$ standard deviation. But how large is this standardized effect size? To put this effect size into perspective, consider the average PISA 2018 mathematics score for Thai students of 418.6 with a standard deviation of 78.9. Suppose that we would like to be able to detect an effect size of 5 percent on the PISA scale score (20.9 points). This effect size corresponds to 0.265 standard deviation (20.9/78.9).

To calculate the required sample size of the treatment and the control schools (size of cluster), we will also need information on: the intra cluster correlation coefficient $(ICC\ or\ \rho)$ – the level of correlation in test scores for students in a given school relative to the overall correlation of students in all schools; and the proportion of variation in student test scores that we expect to be able to control for by including observable covariates other than the treatment indicator (R^2). These parameters can be obtained from previous research or can be estimated using actual student level data.

For this exercise, we utilize a Thai subset of the PISA 2018 data. Similar to the econometric specification that we expect to be using, we regress student mathematics score on age, grade, gender, student socioeconomic background, the adequacy of the number of teaching staff and the quality of their qualifications. The estimation is done using random effects panel data regression, where the panels are the schools and the outcomes are the individual student test scores. The resulting regression estimates are presented in Table 7.1.

Table 7.1. Random Effects Panel Data Regression of PISA 2018 Math Scores on Selected Covariates

	Coef.
Age	-2.171
	(2.520)
Grade	20.363***
	(1.794)
Female	4.871***
	(1.353)
Economic, social, and cultural status index	14.644***
	(1.118)
Economic, social, and cultural status index squared	3.824***
	(0.410)
School's instruction hindered by lack of teaching staff: (Not at all)	
Very little	8.223
	(6.870)
To some extent	-3.515
	(6.950)
A lot	-17.845
	(13.193)
School's instruction hindered by inadequate or poorly qualified teachers: (Not at all)	
Very little	-14.684**
	(6.216)
To some extent	-22.612***
	(7.944)
A lot	-26.559*
	(14.512)
Intercept	483.683***
	(39.971)
Observations - students	8,582
Observations - schools	290
Overall R-squared	0.246
Between cluster standard deviation σ_u	40.188
Within cluster standard deviation σ_e	57.241
Intra-cluster correlation coefficient ρ	0.330

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

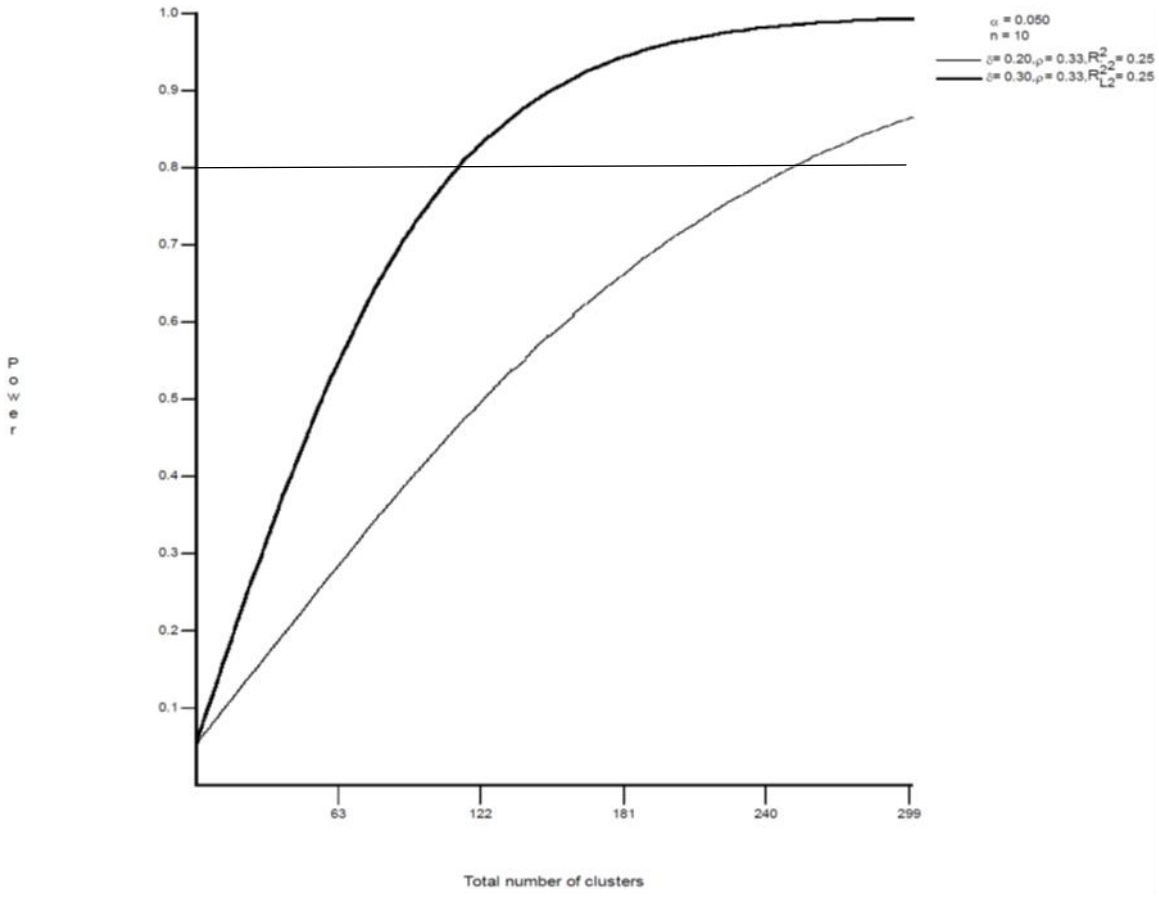
Definition

- **Power of test** – The likelihood that, when a treatment has an effect, you will be able to distinguish the effect from zero i.e., from a situation where the treatment intervention has no effect, given the sample size
- **Level of significance** (α) – The likelihood that the measured effect from statistical tests performed to determine whether one group (e.g. the treatment schools) is different from another group (e.g. the control schools) on certain outcome indicators of interest (e.g. test scores) did not occur by chance

From the estimated random effects panel data regression, we conclude that $R^2 = 0.25$ and $\rho = 0.33$.

In designing this impact evaluation, we wish to calculate the number of clusters (schools) required to obtain a minimum power of 0.8 and a level of significance of 0.05. Using the key assumptions on the parameters based on our regression results, the Optimal Design Software developed by Raudenbush, S. W., et al. (2011) is employed for our statistical power analysis.

Figure 7.1. Statistical Power Curves



Summary of the key assumptions used to compute the required cluster size for Intervention 1:

- Minimum of n=10 students in each cluster (school)
- Proportion of variation in student test score explained by included observable covariates $R^2 = 0.25$
- Intra-cluster correlation $\rho = 0.33$
- Minimum treatment effect size between $\delta = 0.2 - 0.3$ standard deviation
- Minimum power of test of 0.8
- Level of significance $\alpha = 0.05$

From the statistical power curves shown in Figure 7.1, we conclude that for Intervention 1: "The impact on students' schooling outcomes from upgrading Protected schools to meet the required FSQL standards,"

- To detect a treatment effect of size 0.2 SD with 80 percent power, we would need a cluster size of 250 schools (125 each from the treatment and control group)
- To detect a treatment effect of size 0.3 SD with 80% power, we would need a cluster size of 112 schools (56 each from the treatment and control group)

A similar analysis is carried out to determine the required cluster size for Intervention 2: "The impact on schooling outcomes of "displaced" students who will be relocated from closed down "Affiliated" schools to expanding "Hub" schools, which will be upgraded to meet the standards." However, these Affiliated schools are generally larger than the Protected schools, so we will be randomly selecting a sample size of between 15-20 students in each of the grades of interest in each school (use n=15). Furthermore, the control group will now come from the Affiliated schools which will not be closed down during the 3-year pilot period.

- To detect a treatment effect of size 0.2 SD with 80 percent power, we would need a cluster size of 232 schools (116 each from the treatment and control group)
- To detect a treatment effect of size 0.3 SD with 80 percent power, we would need a cluster size of 104 schools (52 each from the treatment and control group)

Finally, the power analysis is again conducted to determine the required cluster size for Intervention 3: "The impact on schooling outcomes of "receiving" students in expanding Hub schools, which will be upgraded to meet the standards." These Hub schools are generally larger than the Protected and the Affiliated schools so we will be randomly selecting a sample size of between 20-25 students in each of the grades of interest in each school (use n=20). The control group will now come from the designated Hub schools which will not be upgraded or expanded during the 3-year pilot period.

- To detect a treatment effect of size 0.2 SD with 80 percent power, we would need a cluster size of 222 schools (111 each from the treatment and control group)
- To detect a treatment effect of size 0.3 SD with 80 percent power, we would need a cluster size of 100 schools (50 each from the treatment and control group)

Notice that, to conduct the impact evaluation as planned on the pilot schools we would need to ascertain that a minimum of 56 Protected schools will be given the treatment for Intervention 1. For Intervention 2, a minimum of 52 Affiliated schools will need to be closed down and their students reassigned to their designated Hub schools which will be upgraded. However, until we have selected which Affiliated schools will be closed down during the pilot stage, we will not know for sure how many Hub schools will be receiving the "displaced students."

Recall from Chapter 3 that our school network reorganization software simulation showed that at the national level, 17,120 Affiliated schools could be merged into 6,821 Hub schools – a ratio of 2.51:1. Applying this ratio, it can be expected that in order to attain a minimum sample size of 50 treated Hub schools for treatment Intervention 3, as many as 126 Affiliated schools may need to be closed down during the pilot stage.

Table 7.2. Timeline for the Monitoring and Evaluation of the Pilot Interventions

<table>
<tr><th>Interventions</th><th>AY 2021</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th></tr>
<tr><td>1) Students' schooling outcomes from upgrading "Protected" schools to meet the required FSQL standards</td><td>Upgrade the selected Protected schools to reach FSQL standards</td><td rowspan="3">Begin following a random sample of students entering G6 (Cohort 1), G5 (Cohort 2), and G4 (Cohort 3) at the beginning of the academic year in the treatment and control schools Grade 7</td><td rowspan="3">Collect information on ONET scores in math, science, and Thai language (as well as information on dropout) at the end of G6 for Cohort 1</td><td rowspan="3">Collect information on ONET results in math, science, and Thai language (as well as information on dropout) at the end of G6 for Cohort 2</td><td rowspan="3">Collect information on ONET results in math, science, and Thai language (as well as information on dropout) at the end of G6 for Cohort 3</td></tr>
<tr><td>2) Schooling outcomes of "displaced" students who will be relocated from closed down "Affiliated" schools to expanding "Hub" schools, which will be upgraded to meet the standards</td><td>Close the selected Affiliated schools and relocate students to designated Hub schools</td></tr>
<tr><td>3) Schooling outcomes of "receiving" students in expanding Hub schools, which will be upgraded to meet the standards</td><td>Upgrade the selected expanding Hub schools in this pilot to attain the FSQL standards</td></tr>
</table>

8. Conclusion and Policy Recommendations

The Equitable Education Fund (EEF) approached the World Bank for technical and advisory services to support them to design a project to narrow the performance gaps between schools in selected provinces/areas in Thailand. This final report contains the deliverables under the reimbursable advisory agreement that was signed between the World Bank and EEF. The EEF expects to use this advice to develop a small-scale program to pilot an approach or approaches to narrow the performance gaps, in collaboration with the Office of the Basic Education Commission (OBEC). If this proves successful, the step after that would be for OBEC to design, fund and implement a much larger program to address the large number of small schools. EEF's (and OBEC's) intention is to improve the quality of "Protected" primary schools and small primary "Hub" schools which are strategically located so that they are able to accommodate students from other nearby small, poor quality "Affiliated" schools, which will be closed down. It is expected that the lessons learnt from the pilot will provide policymakers with valuable evidence, making future nationwide expansion of the program more likely to be successful. The key policy recommendations which came out from the analyses in the preceding chapters are summarized below.

8.1. Abandon the current educational personnel allocation rule

This report reveals important insights on the main shortcomings of the current educational personnel allocation criteria for Thai public schools. The analysis finds clear evidence that the Teacher Civil Service and Educational Personnel Commission (TEPC) allocation rules are severely penalizing small schools and the mainly disadvantaged students enrolled in them, thereby worsening educational inequality. The TEPC rules are clearly meant to "ration" the number of teachers in the system by limiting the number of teachers in small schools. These rules are fundamentally inconsistent with the three variables that should drive personnel allocation in an education sector: the curriculum that needs teaching; the number of teaching hours each teacher can teach; and teachers' professional background.[49] The end result is that most small schools with less than 120 enrolled students (in the language of Chapter 4, these are the Type 1 and Type 3 schools) are allocated much less teachers than the number of classes taught in the schools. Around half of OBEC schools are classified in this category.

A teacher demand model is proposed as a solution to this systemic teacher rationing process. The "model" is straight-forward: it simply asks: given Thailand's curriculum (i.e. the hours of math, Thai, etc. that needs teaching); the degree of specialization of each teacher; and teacher teaching loads (i.e. how many hours each teacher is allowed to teach per week), how many teachers should be assigned to a school of a particular size. In short, the model is our attempt to quantify how many teachers a school should have, taking into account Thailand's curriculum, rules regarding teacher training and teaching loads, and appropriate class sizes.

However, under the current situation where there is a very large network of small schools, the teacher demand model estimates that the "adequate" allocation of teachers nationwide should be 542,851.

[49] i.e. teacher trained to teach physics for 8th graders may be able to math for 4th graders but not English for 9th graders

Moreover, if school management staff (principals and deputies) are also taken into consideration, the total educational personnel required would go up to 579,007. This requirement means that as many as 111,982 additional teachers and school managers are needed to be deployed, which is around 24 percent of the current workforce of 467,115.

8.2. Rationalize Thailand's oversized school network and redistribute teachers according to the proposed Teacher Demand Model

A better and more cost-efficient approach is to drastically downsize the vast network of schools and to ensure that limited educational resources are equitably redistributed to improve both the quality and equity of the system. A school network reorganization software was developed for this very purpose. The software is a tool for policymakers to systematically classify schools into 5 mutually exclusive school-type categories. These are: i) Hub schools; ii) Affiliated schools; iii) Protected schools; iv) Isolated schools; and v) Large schools. Options for the criteria to be used to determine the 5 school types are provided in the software. These options serve as the policy variables for policymakers and different options can be selected for different districts/provinces to better suit local circumstances. The software will suggest which of the Affiliated schools could be merged with which of the identified Hub schools so that the aggregate travel distance for the students is minimized.

The results of one reorganization scenario, discussed in Chapter 3, show that if the school network reorganization is carried out fully, the total number of schools nationwide would decline from 29,466 to 12,346. The economies of scale resulting from the school merger and the appropriate redistribution of existing teachers would completely eliminate the current teacher shortages. In fact, the total number of educational personnel (teachers and school managers) needed could decline over time to 441,689 if the school network is gradually reorganized, and the current educational workforce of 467,115 would be more than adequate. Due to the natural retirement rates of teachers and school managers, Thailand can gradually consolidate its school network without having to lay off a single personnel in the process. Any necessary reductions amongst existing staff could very likely be handled through normal processes since about 15,000 teachers, on average, will be retiring or otherwise leaving the profession each year over the next six years.

Furthermore, our analysis finds that despite the large number of school closures, the average travel distance which the poor and the very poor travel would remain virtually unchanged, while that for the non-poor would decline. The decline in the average travel distance may seem counterintuitive at first. This is due to the implicit assumption behind the model that after the school network reorganization, every student would "choose" to attend the school located closest to home.

8.3. Introduce a "Special Hardship Allowance" (SHA) salary component for educational personnel assigned to a hardship post

Another key challenge Thailand faces regarding educational personnel allocation is that higher-qualified and experienced (and hence more expensive) teachers and school managers are seen to gravitate towards larger urban schools. The existing centralized teacher deployment process allows teachers to be redeployed to any location of their own choosing once they have been in service for

over two years (provided there is an available teaching position). Furthermore, the system does not provide any incentive to educational personnel to work in schools in remote areas. A more equitable distribution of personnel qualification across schools can be achieved if either a greater share of the higher-qualified and experienced personnel can simply be assigned to rural schools, or if a system can be designed to provide the right incentives for such moves.

At the moment, the same standard salary scales are applied across all geographical areas of the country, regardless of specific characteristics of the areas such as transport inaccessibility or lack of basic infrastructure. This report recommends an introduction of a "Special Hardship Allowance" (SHA) component for educational personnel assigned to a hardship post. A School Hardship Index, which will serve as proxy for the hardship faced by personnel in schools located in difficult environments is designed in Chapter 4. This index could be used to determine the level of SHA associated with a posting location, with an objective to incentivize more highly qualified and experienced educational personnel to work in hardship areas and thus further promote equity.

8.4. Revise the current per-student allocation by abandoning the underprivileged subsidy rationing process and introducing transportation grants for students affected by the reorganization

The analysis in Chapter 4 finds that the underprivileged subsidy rationing process has put small schools with high concentration of poor students at an even greater disadvantage. To address this inequitable allocation of the underprivileged subsidy, this report recommends that the "ceiling system" be abolished altogether and that each school be allocated the underprivileged subsidy provision based solely on the number of poor students enrolled in the school. Should there be insufficient budget in any given year, it is recommended that the rationing process be done on a pro rata basis.

The report also explores and costs out the option of introducing transportation grants to incentivize students and their parents to support the proposed school network reorganization plan. An initial design is proposed, which could serve as a starting point for policy discussion. The design is based on the premise that: students living within 5 km from their nearest schools would not be eligible for the transportation subsidy, nor would students attending secondary schools since these schools are not included in the reorganization plan; and the maximum amount of subsidy is capped for travel distances from home to school of no more than 50 km. Those students who would live more than 50 km away from their schools after the reorganization would be given the choice of either receiving the ceiling transportation subsidy or becoming a boarding student and receive a per-student boarding subsidy.[50] The analysis in Chapter 4 (section 4.6) shows that the efficiency gains resulting from the school network reorganization would be more than sufficient to fully fund the proposed transportation grants (the least cost air conditioned bus option), the boarding subsidy, and the underprivileged allocation for all poor students in Thailand.

[50] The simulation estimates that there would be only 92,765 such students after the school network reorganization. It is assumed that all of them would choose to become boarding students.

8.5. Consider the use of formula funding for the distribution of current expenditure to schools

After the vast network of schools is downsized as recommended, Thailand may want to re-think its school financing system in the longer term. An important element in such reforms would be to shift from financing inputs based on arbitrary central resource allocation rules to financing outputs or even results using well-designed funding formula. However, the main challenge lies in estimating the parameters of the formula, which adequately reflect the different per-student costs associated with providing different types of education in different schooling environments to students with diverse needs. For the largest component of schools' recurrent expenditure, the report recommends using the Teacher Demand Model parameters as a starting point for the "basic allocation" formula. The report argues that for the funding of teacher salaries, an application of the same national average wage rate[51] for teachers (and school managers) across all schools, with the number of teachers determined using the teacher demand model, is likely going to be a much more transparent, efficient, and equitable option than the current system. In addition to the basic allocation, it is recommended that the "needs-based allocation" be revised as suggested in (8.4), and that a review be conducted on the adequacy of the two remaining building blocks of a funding formula not rigorously addressed in this report.[52]

Moreover, it is important to note that in order to progress towards the financing of results approach, one key question would need to be asked and answered. That is, given student socioeconomic backgrounds, school enrolment size, and other relevant characteristics, how many teachers (in terms of quantity, qualification, specialization, and teaching experience) and other educational resources are considered adequate to achieve a certain desired level of student learning outcome? On an administrative level, a key question would be: in this more decentralized funding scheme, what would be the role of local governments? Such key questions are empirical by nature and would need to be carefully investigated during the pilot stage.

8.6. Introduce Fundamental School Quality Standards for Thailand

The most important reason for proposing such drastic reorganization of the school network is that students attending Thailand's smaller schools are clearly being poorly served. Their schools struggle with lasting teacher shortages, and they have poorer infrastructure and poorer supplies of materials. This report recommends introducing a set of fundamental school quality standards (FSQLs) for two main reasons: first, by having a set of "minimum standards" for all schools, the current, blatant underinvestment in smaller schools will become more visible. Second, it is hoped that the standards can become a visible and tangible part of the promise that policy makers can make to communities when seeking to convince them to close down their schools. That is, the promise would be: look how inadequate your current school is vis-à-vis these standards. The new school – less than 6 km down the road – meets all of these standards.

[51] Possibly adjusted for differences in the cost of living across provinces.

[52] These are "An allocation for curriculum enhancement" and "An allocation for students with supplementary educational needs."

8.7. Develop and implement environment and social risks and impact mitigation measures for the school network reorganization

The options/instruments/recommendations to support students, parents, school personnel, and communities affected by the reorganization of the school network, discussed in Chapter 6, must be developed. These include, inter alia, (i) strategic communication for stakeholder consultations; (ii) guidance on the analysis of relevant environmental and social issues and risks, as well as recommendations on how to address identified risks in accordance with applicable Environmental and Social Standards; and (iii) guidance on establishing a grievance redress mechanism. The chapter also provides a preliminary environmental and social risk screening and mitigation roadmap which includes identification of all the risks and potential mitigation measures for the relevant ESS that are applicable.

Regular and systematic community engagement, in particular, can help schools in implementing reforms and new initiatives as the buy-in from parents and community leaders of the culture of continuous school improvement embodied in the use of FSQLs is established. Communities help schools both by way of material resources, donations and through the political power which they can exercise on behalf of the schools. They can also make schools more accountable to the implementation of new policies and reforms.

8.8. Develop a monitoring and evaluation strategy for the impacts and processes of the interventions during the pilot phase

The report recommends that a well thought through and rigorous impact evaluation strategy be put in place during the pilot intervention stage in selected areas/provinces. A guidance-note for evaluating the impacts of the proposed FSQL school upgrading intervention on learning outcomes and other important key performance indicator were developed in Chapter 7. In particular, the note describes the key performance indicators to be evaluated, the important variables that will be used (and collected) to evaluate the impacts of the FSQL program on the indicators, the process for selecting the treatment and the control schools, the impact identification strategy, and the appropriate sample size for each group.

Three broad aspects of the policy intervention will be evaluated at the individual student level:

1. The impact on students' schooling outcomes from upgrading "Protected" schools to meet the required FSQL standards

2. The impact on schooling outcomes of "displaced" students who will be relocated from closed down "Affiliated" schools to expanding "Hub" schools, which will be upgraded to meet the standards

3. The impact on schooling outcomes of "receiving" students in expanding Hub schools, which will be upgraded to meet the standards

In addition to assessing the impacts of the intervention, it is also very important to put in place a "process monitoring" strategy during the pilot stage: that is, to put in place a way to capture the "story" of how a particular geographical area managed to consolidate its school network. Was it a charismatic major that did the difference? What was the dynamics at town hall meetings? What messages delivered

(and by whom) appear to have made a difference? Given the size of the challenge Thailand faces, it will need to have in place a way to systematically learn from the places that move forward vs. those that get stuck.

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