



**IDEAS**  
INSTITUTE OF DEVELOPMENT  
AND ECONOMIC ALTERNATIVES

# Revision of the Non-Salary Budget Formula Report

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Dr. Faisal Bari, Dr. Rabea Malik, Fatiq Nadeem

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Institute of Development and Economic Alternatives (IDEAS)

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19-A, FCC, Gulberg IV, Lahore, Pakistan Tel:+92-42- 35778178-79  
<https://www.ideaspak.org>

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## 1. Introduction

### 1.1. Non-salary budget in Punjab: brief overview of policy initiation and context

The Non-Salary Budget (NSB) was introduced in 2014, starting in 9 districts<sup>1</sup> and phased into all 36 districts by 2016. It replaced the School Management Committee (SMC) funds as the main development grant to schools. The innovation was the direct transfer of NSB funds to a school bank account, removing the need for school heads to have expenditure approved by the Auditor General's office. Additionally, NSB funds allocations in 2014 were formula-based; the formula in turn was need-based and linked to enrollments.

This policy revision was introduced as part of the Punjab Education Support Program II in 2013/14, and the objective was to increase school level financing in an efficient and effective manner. The objective of enhancing autonomy of school management and planning with the ultimate goal of improving learning in government schools has also been mentioned as a policy objective.

In theory, funding formulas are effective policy tools for: ensuring adequate resource allocations to schools, incentivizing them to increase and maintain enrollment, reducing bureaucratic barriers and empowering schools to respond to evolving school needs. It can also be a powerful policy tool for governments to ensure equity in resource distribution.

The 2014 NSB formula incorporated principles of adequacy, transparency, efficiency and equity. It introduced the principle of enrollment-based school financing to Punjab. It also took into account administrative feasibility for operating the formula by basing its calculations on administrative indicators that are collected and updated annually, ensuring that the formula calculations were as accurate and sharp as the data would allow. The overall budget envelope for the formula was 1.3 billion for 9 districts in 2013/14, raised to Rs. 14 billion in 2015/16.<sup>2</sup>

The formula application and function has been evaluated (third party valuation). The constraints to effective functioning of the formula emerge from the system in which it is being implemented: inefficiencies in mechanisms of funds transfers in the finance department, and persistent inertia in school management practices (in not all but a majority of schools), limitations of available administrative data.

Following a couple of years of operations, a revision of the formula has been commissioned to introduce updates based on the evolving nature of school needs, and policy priorities of the school education department. This report presents the details of the formula revision exercise.

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<sup>1</sup> Districts included in the first phase of the NSB roll out included: Chakwal, Chiniot, Khanewal, Muzaffargarh, Nankana Sahib, Okara, Rahim yar khan, Sargodha, and Sialkot.

<sup>2</sup> The NSB envelope has been increased further to 16 billion.

## 1.2. Revision of the 2014 NSB formula

The purpose of the revision exercise is to evaluate the logic of the 2014 formula in light of its objectives, understand its functioning, and make proposals for simplifying it as far as possible. A principle purpose of the exercise is to address the 'asks' from the Project Management and Implementation Unit (PMIU) of the School Education Dept. (SED) for the formula, which include:

1. Prioritization of missing facilities
2. Prioritization of schools in Southern districts and inclusion of other equity indicators
3. Prioritization of a baseline number of teachers and classrooms in schools
4. To function as an alternative incentive scheme
5. Inclusion of early childhood education requirements to funding mechanisms

The approach taken to the revision of the formula has included the following set of steps:

- A series of conversations with stakeholders involved with the design and implementation of the 2013/14 formula
  - to understand its functioning , the principles underpinning it and the priorities in mind
  - to understand the new needs of the SED and PMIU
- A set of conversations with head teachers about experiences with the NSB and their needs
- Disaggregation and documentation of the current formula and its components
- A reconciliation of the asks with the current formula to determine whether the requirements are already being met; and a comment on the other requirements and possibilities of inclusion given administrative data constraints in Punjab
- Incorporation of the five asks into the formula to propose a revised version
- Simulation of projected allocations for individual schools and overall school categories

The proposed formula was then tweaked in light of feedback and finalized according to the final directives from the PMIU.

## 1.3. Outline of the report

Section 2 provides a description of the 2013/14 formula, its components and their functions. In addition to providing an understanding of how the needs-based formula is functioning, it allows us to consider whether some of the requirements for the revision are already being met. Section 3 provides estimates of how much a typical school is receiving under the current formula. Section 4 discusses the 'asks' for the revision, in light of what is already in the formula and the data constraints. Section 5 lists proposals for the formula revision. We propose a series of options for the revisions, taking into account new policy priorities of SED. We provide simulations to show what the typical schools will be receiving compared under the new proposals.

Section 6 includes details of the finalized formula under this round of revisions and reflects the directives received by the PMIU.

## 2. Description of the 2013/14 NSB formula

The 2013/14 formula, developed by Rosalind Levacic and Jawad Vohra (Vohra & Levacic, 2012) is a needs-based formula that incorporates principles of adequacy, efficiency, transparency and administrative expediency. It introduces the notion of enrollment-based school financing to Punjab.

Two key guiding principles for the formula design are adequacy (to ensure the basic needs of the schools were met) and the flexibility of adjustment to changes in overall envelope of available funds, without compromising the priorities of the formula or principles of fairness and equity built into it. To that end: i) the formula linked allocations to enrollments (as school needs vary by enrollment), ii) included components reflecting basic minimum requirements of the schools, iii) introduced weights to ensure the formula remained invariant to changes in the overall envelope (Vohra & Levacic, 2012).

### 2.1. The 2013/14 Formula Equation

The current Non-Salary Budget Entitlement (NSBE) is summarized by the following equation.

$$NSBE_i = FSA_i + SRP_i + BSE_i + FN_i + BO_i$$

i = school

$FSA_i$  = Fixed School Allocation

$SRP_i$  = Student Retention Premium

$BSE_i$  = Basic Student Entitlement

$FN_i$  = Furniture Needs

$BO_i$  = Building Operations

The formula has five components, which are calculated separately based on sub-equations. Each of the components reflects a policy priority that is considered a basic developmental need for government schools in Punjab. We describe the components and their functions in more detail further below.

A key feature of the formula is the weights that are built into the formula. These become apparent during the description of the components; but briefly, the formula varies funds to each school:

- By level of school (primary, middle high).
- For different functions. Each of the five components represents a different function.
- Variations by enrollment are built into calculations of components.

The weights built into each of the components allow this variation to take place.

## 2.2. The components explained

This section disaggregates the five components of the 2013/14 formula and describes their purpose.

### Component 1: Fixed School Allocation (FSA)

The Fixed School Allocation is a lump sum amount weighted by type of school.

$$FSA_i = w_1P_i + w_2M_i + w_3H_i + w_4HS_i$$

$P_i$  = Primary (*Kachi to Grade 5*),  $w_1 = 1$

$M_i$  = Middle (*Kachi to Grade 8*),  $w_2 = 1.47$

$H_i$  = High (*Kachi to Grade 10*),  $w_3 = 1.47$

$HS_i$  = Higher Secondary (*Kachi to Grade 12*),  $w_4 = 2$

Fixed school allocation varies by level of school: primary receives least, middle more than that, high more than that. The amount received by primary schools is the base allocation. After that, weights are allocated in a way to indicate a 47.5% increase in the budget allocated for the middle and high level of schooling compared to primary schools and 100% more allocation in the budget for Higher-Secondary compared to the primary level of schooling.

FSA determines the basic amount that is a mandatory requirement for each school for it to execute its annual school development plan. While FSA and BSE on first look appear to be very similar, FSA is playing an important role by allocating funds by type of school. Removing it takes money away from primary schools.

### Component 2: Student Retention Premium (SRP)

The student retention premium is the first of two needs-based components that take costs of providing services for students into account. The SRP is a reflection of the desire to provide an incentive to the school to retain students until the terminal grade. To that end, the SRP equation is designed to increase allocations for students in higher grades.

$$SRP_i = x_1 G_1 + x_2 G_2 + x_3 G_3 + x_4 G_4 + x_5 G_5$$

$G_1$ = If grades 2-4 exist in the school,	$x_1 = 1$
$G_2$ = If grade 5 exists in the school,	$x_2 = 1.5$
$G_3$ = If grade 8 exists in the school,	$x_3 = 1.6$
$G_4$ = If grade 10 exist in the school,	$x_4 = 1.7$
$G_5$ = If grade 12 exists in the school,	$x_5 = 1.7$

SRP divides the schools into categories of classes they house. These categories are Grades 2-4, Grade 5, Grade 8, Grade 10 and Grade 12. The formula sets Grades 2-4 as the base and adds up a 50% increase in allocation for schools with grades 5 compared to grades 2-4, a 60% increase in allocation for schools with grade 8 compared to grades 2-4, and a 70% increase in allocation for schools with grade 10 compared to grades 2-4, and a 70% increase in allocation for schools with grade 12 compared to grades 2-4.

Our understanding is that a school gets funds as part of this component if there is even 1 child in any of the grades. As an incentive scheme for retention, this becomes a blunt instrument, particularly if the recipient (head teacher) is not distinguishing between the purposes of funds in their usage.

The revision (discussed further below) involves including a retention ratio into the calculation of the component in a way that the formula is triggered if enrollment in the terminal grade in a school increases.

### Component 3: Basic Student Entitlement

BSE is the second of two components that vary funding by student need (the first being SRP). BSE is the enrollment based component, which explicitly includes enrollment into the equation. BSE also increases by level of school (primary < middle < high) based on the working assumption that costs of provision of education are higher for higher levels of study.

$$BSE_i = y_1 ENR_i P_i + y_2 ENR_i M_i + y_3 ENR_i H_i + y_4 ENR_i HS_i$$

$P_i$ = Primary (Kachi to Grade 5),	$y_1 = 1$
$M_i$ = Middle (Kachi to Grade 8),	$y_2 = 1.05$
$H_i$ = High (Kachi to Grade 10),	$y_3 = 1.11$
$HS_i$ = Higher Secondary (Kachi to Grade 12),	$y_4 = 1.24$
$ENR_i$ = Number of students enrolled in the school,	

The cost increases work through weights allocated to type of school. The base is set as the primary schooling and it increases by school type. The enrollment of students in the elementary school type receives 5% more as compared to the primary schools. The enrollment of students in the high school type receives 11% more as compared to the primary schools. The enrollment of students in the higher-secondary school type receives 24% more as compared to the primary schools.

BSE is retained in the proposed revisions, as is.

#### Component 4: Furniture Index

The furniture index is a deficiency index that caters to replacement and provision of furniture for students. It is also enrollment based and takes into accounts needs for students and teachers, based on standard rules: one bench for 3 students, and a chair per teacher. The annual school census provides data on available furniture, based on which, needs are calculated.

$$FN_i = FDI_i$$

$FDI_i$  = Furniture Deficiency Index,

$$FDI_i = WSN_i \left( \frac{a(NSE \text{ TOTAL ALLOCATION})}{\sum_i WSN_i} \right)$$

$WSN_i$  = Weighted Student Need,

NSE TOTAL ALLOCATION = Total Amount allocated to Non-Salary Budget<sup>3</sup>,

a = 0.1493,

$$WSN_i = ENR_i \left[ \left( \left( \frac{FPT_i}{ENR_i} \right) b \right) + \left( \left( \frac{SPT_i}{e} \right) c \right) \right]$$

$FPT_i$  = Furniture for teachers in the school,

$SPT_i$  = Furniture per student in the school,

b = 0.0706 (*Teacher deficiency weights*),

c = 0.9414 (*Student deficiency weights*),

-d = 40 (*Assumed Teacher Student Ratio*),

e = 3 (*Assumed Student Furniture Ratio*),

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<sup>3</sup> This is the amount allocated by the Government to the NSB exercise.



## Component 5: Building Operations

The building operations component takes into account the need for maintenance and repair of the building. This is also enrollment based; which provides a proxy for the size of the building. The formula includes covered area in the calculations.

$$BO_i = z_1 ENR_i BSI_i$$

$z_1 = 0.5$  (Repair need coefficient),

$ENR_i$  = Number of students enrolled in the school,

$BSI_i$  = Building Status Indicator Dummy (This is equal to 1 if school building is in need of repairs, and equal to 0 if satisfactory condition.)

In the revisions we are suggesting that the uncovered area also be included in calculations of the formula. Head teachers during focus groups stated maintenance of gardens and land as a need.

### 2.3 The process of running the formula

The formula is run on data from the Annual School Census (annual data), twice a year (every 6 months). The equation is run in two ways: bottom up and top down. The top down approach computes the equation with the total available amount in the provincial budget as a constraint. The bottom up approach computes the equation with no constraint, and generates an ideal amount each school could need if there was no budget constraint. Our proposal is that the formula be run once a year to allow certainty to schools, but we recognize that there are larger systemic issues here where the mechanisms of funds transfer from the finance department needs to be fixed.

On weights: Rosalind and Vohra calculated weights that go into the sub-component equations based on cost surveys. A new cost survey could be undertaken every ten years or so to account for inflation or other cost changes.

### 3. The typical school NSB-receipts analysis

Before we get to the proposed revisions of the formula, we run the existing formula and calculate the receipts that a typical school in each of the categories is receiving. This exercise is useful to give a sense of the variations in receipts by primary, middle and high schools. The process followed:

WE calculated the average enrollment for each category of school type using the latest EMIS numbers:

- Primary schools: 100 students
- Middle schools: 250 students
- High schools: 500 students

We call these typical schools as they represent average enrollment numbers for the largest number of schools in each category (See Appendix A for enrollment profiles).

Table 1 presents the details of running the formula with this underlying assumption about average school size at each level. The table presents numbers for what the schools receive for each of the components, as well as total NSB receipts. For the calculations we assume the overall envelope to be Rs. 14.2 billion.

Table 1: NSB receipts for the average school, by school type and functional components

<b>NSB Budget Components</b>	<b>Primary</b>	<b>Middle</b>	<b>High and higher secondary</b>
Fixed School Allocation (FSA)	50,560	75,066	76,698
Student Retention Premium (SRP)	22,581	58,961	138,677
Basic Student Entitlement (BSE)	28,441	68,651	148,485
Furniture Needs	22,348	44,588	78,347
Building Operations	29,651	70,738	148,173
<b>Total NSB received by an average school</b>	<b>1,53,581</b>	<b>3,18,004</b>	<b>5,90,380</b>
<b>Total NSB received by all schools</b>	<b>5.6 billion</b>	<b>2.7 billion</b>	<b>4.2 billion</b>
<b>Actual Allocation (2016/17)</b>	<b>5.5 billion</b>	<b>2.7 billion</b>	<b>6.1 billion</b>

Source: EMIS 2015-16. Note: 1. For these calculations the overall envelope is assumed to be Rs. 14.2 billion. 2. The figures are for the average primary school (assumed to have 100 enrollment), average middle school (assumed to have 250 enrollment), high and higher secondary school (assumed to have 500 students). 3. Total NSB received by all schools is obtained by multiplying average receipts by a typical school with the total number of schools in each category.

According to the formula 2013/14, yearly NSB receipts:

- For a typical primary school with 100 students are approx Rs. 1,54,000.
- For a typical middle school with 250 students are approx. Rs. 3,18,000
- For a typical high or higher secondary school with 500 students are approx. Rs. 5,90000

The average high school receives the most, the average primary school the least (Table 2). But overall primary schools receive the most (Table 1, second last row).

Table 2: Comparisons of amount received, by type of school

	<b>How much more does an average Middle school receive compared to Primary Schools?</b>	<b>How much more does an average High school receive compared to Middle Schools?</b>	<b>How much more does an average High school receive compared to Primary Schools?</b>
Fixed School Allocation	48%	2%	52%
Student Retention premium	161%	135%	514%
Basic Student Entitlement	141%	116%	422%
Furniture Needs	100%	76%	251%
Building Operations	139%	109%	400%
<b>Total NSB allocation Avg school</b>	107%	86%	284%

This table provides a comparison of differences in receipts by level of schools under the NSB formula, highlighting potential equity concerns. A typical middle school receives 107% more funds than a primary school, and a typical high or higher secondary school receives close to 300% more than a typical primary school. The largest gaps emerge in the Basic Student Entitlement and Building Operations categories.

## 4. Requirements for Formula Revision

This section includes a list of requirements provided for the revision, a commentary on their logic and whether they should be retained with some discussion about how they may be incorporated.

### 4.1 Revising the formula to increase targeting based on equity principles

The ToRs asked for prioritization of districts in Southern Punjab in the formula, i.e. that certain districts should be receiving more funds than others given the level of development of schools in those area. Equity principles would dictate schools that are lagging receive more than proportional resources in order to catch up. Schools that may be located in backward areas, poor communities may also require more than the proportional amount. The question is whether the formula can address equity concerns based on geographical location of schools. Additionally, there is a larger question of whether a school-based formula is an appropriate tool to be used to target poverty, in a context where head teachers lack the autonomy (and arguably implementing capacity) to directly support poor families. A good way of addressing disparities is to use the formula to target school level deficiencies as the formula is already doing: teacher deficiency, furniture and other deficiencies. There is a possibility of making the formula more responsive to needs of schools with children that require extra support (disabilities, learning needs etc). Effectiveness of this depends quite a bit on the ability of information systems to identify children with special needs in our schools.

Having said that, the following requirements have been included in the revisions:

**4.2 Prioritizing districts in southern Punjab:** One requirement is for the formula to respond to district level deprivation. Our position is that a school based formula is a blunt instrument to use for addressing community level deprivation:

1. This is a hard variable to go down to the school level, because of data availability in Pakistan
2. There is not much the school can do with the money that is given to them with that money

For there to be sharp targeting of deprivation, very accurate and rich community level deprivation information is required. Using district level deprivation numbers is not enough. There are large variations in development levels of communities, tehsils and schools within each district. Furthermore, deprived schools can be found in developed districts as well, examples can be found in Lahore. Similarly, there will be good schools and deprived schools even within Southern districts. It is likely that the most deprived schools in Lahore compare with schools in Rajanpur. And vice versa. For accuracy in targeting community level indicators of poverty and development would be the appropriate ones to use. On this front, availability of reliable data on poverty is difficult to come by.

Remoteness was suggested as a measure that could be included in the formula to benefit schools that are far from nearby towns. The logic is these tend to be least resourced, face challenges in teacher recruitment and retention, and may face higher costs of maintenance. The remoteness component is the distance of each primary and middle school from the nearest high school. It is constructed using GPS coordinates provided by PMIU.

**4.3 Prioritization of missing facilities:** This is included in the revisions as an additional component. The TORs define missing facilities as toilets, drinking water, electricity and furniture. ASC data show no variation in electricity and drinking water facilities, and a very large proportion of schools where these facilities are already present. A missing facilities indicator is created using data for unusable toilets. We do not include furniture, because the formula already has a furniture deficiency index (See section below for more detail).

**4.4 Prioritization of a baseline number of teachers and classrooms in schools:** A teacher deficiency indicator is created and added to one of the revisions of the formula. The purpose of the indicator (and -component) will be to provide money to schools to hire part-time teaching coaches.

**4.5 To function as an alternative incentive scheme:** A change to the SRP is proposed rather than an addition of a new incentive component. The revision is made by including a sub-component which is a ratio enrollment in the terminal grade in each school and the starting grade.

**4.6 Inclusion of early childhood education requirements to funding mechanisms:** The early childhood plans are to include a room and staff that does not take away from teaching other grades. Data on ECE will be collected for monthly monitoring data from April 2018. Once data is available, the ECE component can be constructed. One way is for an ECE component to be based on availability of either an ECE room or an ECE care-giver. The formula needs information on: presence of an ECE room, availability of an ECE care-giver in the school. The equation and weights for the component can be as follows:

$$ECE = 0.75 (ECE Room) + 0.25(Caregiver)$$

ROOM = 1 if there is no ECE room in school

CAREGIVER = 1 if there is no ECE caregi-ver in school.

If both ECE Classroom and Teacher are present then the school gets no weight, but if there is either a room missing or a caregiver missing, the ECE component is assigned a weight.

However, dictates of the ECE notification require a flat Rs.3800 per month for this purpose goes to all schools with an ECE classroom. The best way to incorporate this into the formula by triggering a fixed payment of Rs. 3800 to eligible schools. This is done in the following way: the total bill for ECE is calculated by multiplying the number of schools with ECE rooms will be taken out of the total amount allocated for NSB, before the formula is run to make school level allocations. This can only be done once that number is known, i.e. data for ECE are collected through ASC or monthly.

To sum up, the following changes are made to the current NSB formula as part of the revision process:

1. Adding a teacher deficiency indicator, as a new component
2. Adding a missing facilities indicator, as a new component
3. Adding a sub-component of acreage, as a subcomponent of the building operations
4. Revision of the SRP component, to sharpen the incentive for head teachers to retain children to terminal grades in school
5. Adding a remoteness component, as a new component.
6. Adding an ECE component

## 7. Some general changes

## 5. Proposed Revisions to the Formula

The formula is changes in two ways: 1. New components are added; 2. Weights are changed.

### 5.1 Weights

As mentioned in section 2, each of the components of the formula is weighted, and the weights add up to 1. When new components are added, these weights are redistributed among the new components.

Table 3 summarizes the weights associated with various formula versions. Current formula weights are the ones assigned by Rosalind and Vohra. These are taken from the original report. They based the weights on a cost survey conducted in 22 schools. The second column is the weights proposed by IDEAS for the revised formula components, as a rearrangement of the original weights. The approach to weight assignment in the revision is that: a) the total should add to 100, b) we maintain as far as possible the proportions of the weights that Rosalind and Vohra have used. We do not imbalance the importance they have given to components. However, because we need to add new components (row 5 / Simulation 5), we change the weights to be able to accommodate the new components following the two principles mentioned above.

The final weights represent the weights the PMIU asked should be applied for the revised formula. ECE does not have a weight, because it is operationalized as a flat disbursement.

Table 3: Summary table of weights associated with various formula versions

	<b>Current formula Weights</b>	<b>Proposed Weights</b>	<b>Final Weights</b>
School fixed allocation	19.7	13.7	13.7
Basic student entitlement	22.4	13	18
Furniture needs	14.9	10.9	10.9
Buildings operations revised	22.8	13	13
Student retention premium	20	13	13
Teacher Deficiency Indicator	..	13	13
Missing Facilites Indicator	..	13	8
Remoteness	..	10.3	10.3
<b>Total Non-Salary Allocation</b>	<b>100</b>	<b>100</b>	<b>100</b>

## 5.2 The new components

### 5.2.1 Adding a teacher deficiency indicator

The teacher deficiency indicator based on the principle that there should be at least 5 teachers in a middle and high school. In the primary school: STR should be 30:1 for school with less than 90 enrollment, and 40:1 with greater than 90 enrollment.<sup>4</sup> For the formula this works out in the following way:

A middle and high school is deficient if there are less than a baseline of 5 teachers (for schools where there is only one section), OR less than 1.5 per section for schools with more than one section. This is coming from the PMIU document. Similarly, a primary school is deficient, if the STR is less than more than 40:1 for primary schools where enrollment is greater than 90; and if the STR is more than 30:1 for primary schools where enrollment is less than 90.

If a middle school is deficient, it gets allocated a weight of 1.4. If it is not deficient, it gets a weight 0

If a high school is deficient, it gets allocated a weight of 2. If not deficient, it gets a weight of 0.

If a primary school is deficient, it gets allocated a weight of 1. If it's not deficient, it's a 0.

### 5.2.2 Adding a missing facilities indicator

A missing facilities indicator is created using data for usable toilets. It is based on two things: i) official government requirements for number of toilets per school, ii) a needs-based principle – whereby money is allocated based on level of deficiency of toilets in a school.

Government rules prescribe number of toilets based on enrollment, and are as follows:

1. If enrollment is less than 100 , a school should have 2 toilets
2. If enrollment is between 100 and 250, a school should have 4 toilets
3. If enrollment is between 250 and 500, a school should have 6 toilets
4. If enrollment is greater than 500, a school should have 8 toilets

The formula is triggered if a school based on its enrollment category has less than the number of toilets prescribed for that category. The needs-based principle means the school will only receive money for the amount of toilets they need to build to achieve the requirement. For instance, if a school has 200 enrolled and 3 toilets, the deficiency is 1 toilet. The school will receive funding for 1 toilet.

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<sup>4</sup> These standards are taken from the PESRP website and reflect provincial policy stipulations.

### 5.2.3 Adding Acreage

During two focus group discussions with head teachers of schools, a key issue that emerged was the acreage of the school, the cost and effort that goes in maintenance of the open non-built up area of the school. Taking this into account we include a sub-component – of total area – into the building operations. In the TA report, the building operations component included covered area. In the formula that is being run by PMIU, there is only a dummy indicator which reflects building status.

We include a sub-component for total area in the building operations component. This is independent of enrollment. The new equation for Building Operations looks like:

$$\text{Building Operations} = aENR_i(\text{Building Status}_i) + \text{Total Area}_i$$

$ENR_i = \text{Enrolment in the school}$

$$a = 0.5 \text{ (repair coefficient)}$$

If building status is satisfactory, then only total area matters. If building status is not satisfactory, then money provided for both total area and repairs.

### 5.2.4 Revision of the SRP component

A revision of the SRP component is asked for, to sharpen the incentive for head teachers to retain children to terminal grades in school. This revision adds a retention ratio: (Enrollment in terminal grade / enrollment in starting grade). Compared to the previous year's ratio, if enrollments have increased the following weights are allocated: primary = 1, middle = 1.4, high = 1.7.

### 5.2.5 Adding a remoteness component

The remoteness components allocate weights to the primary and middle schools with respect to their differences from the closest high school. The weights are allocated in the following way:

If a school is 0 – 2 km away, 0 weight

If a school is 2- 5 km away, base weight

If a school is 5 – 10 km away, 40% more than base weight,

If a school is 10 or more km away, 70% more than base weight.

The GPS coordinates for high, middle and primary coordinates are used to find out the distribution of schools and their remoteness.



Table 4: Distribution of schools by distance

	<b>Freq.</b>	<b>Percent</b>	<b>Cumulative</b>
<b>0-2 KMS</b>	18,282	41.62	41.6
<b>2-5 KMS</b>	21,977	50.04	91.6
<b>5-10 KMS</b>	3,418	7.78	99.4
<b>10-15 KMS</b>	221	0.5	99.94
<b>15+ KMS</b>	25	0.06	100
<b>Total</b>	43,923	100	

Table 5: Districts in which Primary/Middle schools lie above 10 kms far from the nearest High School

<b>Districts</b>	<b>Freq.</b>	<b>Percent</b>
D.G. Khan	65	26.42
Layyah	56	22.76
Bhakkar	29	11.79
Bahawalpur	24	9.76
Rajanpur	23	9.35
Muzaffargarh	17	6.91
Mianwali	12	4.88
Rahimyar Khan	10	4.07
Jhang	5	2.03
Sheikhupura	3	1.22
Bahawalnagar	1	0.41
Attock	1	0.41
<b>Total</b>	246	100

#### 5.2.6 Flat disbursement for early childhood:

The total bill for ECE is calculated by multiplying the number of schools with an ECE room with the flat rate for disbursement. This is subtracted from the total allocable amount before the formula is run, and the amount for each school added back in to provide the total amount to be disbursed to the school.

## 6 Final Formula

The final formula includes the components discussed above, and the following additions on the insistence of the PMIU staff:

- Increase in the weight of Basic Student Entitlement to 18%.
- A flat allocation of Rs.3800 for early childhood is included.
- A general change which works in the way that if any deficiency in schools no longer applies – such as furniture or missing facilities – the formula redistributes the weights to other components.

The following table simulates receipts by different schools if the new final formula is applied. The envelope used for this simulation is Rs. 14.2 billion.

Table 6: Simulations: Amounts received by a typical and level of school in category

	Primary	Middle	High and higher secondary
<b>Fixed School Allocation (FSA)</b>	32,613	48,856	49,913
<b>Student Retention Premium (SRP) : Revised</b>	15,549	45,211	82,302
<b>Basic Student Entitlement (BSE)</b>	17,826	36,647	1,21,263
<b>Furniture Needs</b>	12,517	41,100	78,683
<b>Building Operations: Revised</b>	15,730	45,674	82,057
<b>Missing Facilities</b>	36,020	34,700	32,968
<b>Teacher Deficiency Indicator</b>	37,130	34,622	78,683
<b>Remoteness</b>	38,656	37,619	0
<b>Total NSB received by an average school</b>	2,06,611	2,87,045	4,36,231
<b>Total NSB received by all schools</b>	6.9 billion	2.6 Billion	4.7 Billion

Source: Monthly monitoring data

For purposes of comparison, the following table shows a comparison of receipts by school under the formula versions.

	<b>NSB funds received</b>	<b>Primary</b>	<b>Middle</b>	<b>High and higher secondary</b>
Current Formula	by an average school	1,53,581	3,18,004	5,90,380
	<b>by all schools in category</b>	<b>5.6 billion</b>	<b>2.7 billion</b>	<b>4.2 billion</b>
Proposed Formula	by an average school	2,01,994	3,18,668	5,25,874
	<b>by all schools in category</b>	<b>7.3 billion</b>	<b>2.6 Billion</b>	<b>3.7 Billion</b>
Final Formula	by an average school	2,06,611	2,87,045	4,36,231
	<b>by all schools in category</b>	<b>6.9 billion</b>	<b>2.6 Billion</b>	<b>4.7 Billion</b>

*Classroom=1 if there is an ECE Classroom.*

$$Distance_i = 1a_i + 1.4b_i + 1.7c_i$$

$a_i$  = 2-5 km's away from the nearest high school,

$b_i$  = 5-10 km's away from the nearest high school,

$c_i$  = 10 or more from the nearest high school,

$$Missing Facilities_i = ENRC_1(2 - ACTUAL TOILETS_i) + ENRC_2(4 - ACTUAL TOILETS_i) + ENRC_3(6 - ACTUAL TOILETS_i)$$

$ENRC_1$  = If enrollment is less than 100 , and school has less than 2 toilets,

$ENRC_2$  = If enrollment is between 100 and 250, and school has less than 4 toilets

$ENRC_3$  = If enrollment is between 250 and 500, and school has less than 6 toilets

$ENRC_4$  = If enrollment is greater than 500, and school has less than 8 toilets

$ACTUAL TOILETS_i$  = No. of toilets in school i.

$$Teacher Deficiency_i = 1PRIMDEF_i + 1.4MIDDEF_i + 2HIGHDEF_i$$

## 7 Utilization of NSB

The utilization has improved in all schools, to up to 70%. However, under-utilization remains a concern. More importantly, ensuring funds are spent for intended purposes remains a concern. Head teachers formula annual school development plans according to a list provided the PMIU. Appendix D includes a list of priorities expressed by head teachers, in a sample of 2000 plans. The top 10 requirements in the list are included in the table below: 54% of them plan for providing free uniforms for students, 44.6% want to conduct awareness events, and 30% want to create an ECE room.

Focus groups with head teachers reveal that school plans are not necessarily the guiding document for actual spending in schools. Emergencies and contingencies often take precedence.

Underutilization is a concern at all levels of schools. More importantly, clean, reliable and detailed information on actual spending areas should be collected at schools to keep track of whether funds are being spent for school development, rather than to supplement operational expenses.

Table 8: Requirements listed in school plans by head teachers

	Frequency	%age
Provide free uniforms	1,355	57.4
Conduct awareness event	1,051	44.6
Create ECE classroom	691	29.3
Provide free bags	672	28.5
Engage with village leaders	548	23.2
Print pamphlets	500	21.2
Buy furniture, chairs, tables for students	380	16.1
Paint school	367	15.6
Provide free shoes	351	14.9
Provide transport	335	14.2

## 8 Conclusion:

All the required revisions are incorporated in the formula. After including all the revisions, there is a redistribution of resources from high schools to primary schools. The average high school still receives approximately the same amount. It is the ones far above or below the average that would have potentially been impacted by the transfer. However, with the increase in overall envelope to Rs. 16 billion, all schools will be receiving more money than they had been before.

With all the components included, the formula is a complex one. Often complex formulas are more effective in contexts with high levels of school autonomy. Where head teachers are highly capacitated administratively, fiscal capacity expansion complements quick and responsive decision-making leading efficient management of schools and to overall improvements in quality. A sense of lack of empowerment among head teachers may result in under-utilization of funds or the funds being used for purposes they are not intended for.

Capacity of primary schools to effectively spend the money: Head teachers in primary schools are the least autonomous, most junior in service and have the least administrative support. In order to ensure effective use of managerial and fiscal authority, there is an urgent need to ensure they receive administrative support from clerks.

Policies that might be directing resources to schools for purposes covered in the formula: Provincial policies independent of the NSB formula are often directing resources for purposes the formula is providing money to schools. For example, the formula transfers funds to schools for construction of classrooms and provision of teachers. There is currently a standalone scheme for building classrooms in

schools throughout Punjab. Similarly, Punjab has hired 80,000 new teachers to improve student teacher ratios across schools. It may be important to be aware of overlap and ensure various policies are not working at cross purposes.

The issue of underspending of NSB revenue must be addressed separately from formula design, through focus groups with head teachers to understand from them in depth contributing factors.

Very important to collect clean, detailed, reliable information on where head teachers are spending (changes to the EMIS system).

## Appendix A: School Profile construction<sup>5</sup>

### **School Categories:**

SCHOOL TYPE	FREQUENCY
Primary	36,222
Middle	8,366
High & Higher Secondary	7,079
Mosque	732
<b>Total</b>	<b>52,399</b>

<b>Higher and Higher Secondary Enrollment Profile</b>		
Categories	Freq.	Percent
0-100	37	0.52
100-200	301	4.25
200-300	801	11.32
300-400	1,120	15.82
400-500	1,080	15.26
500-700	1,582	22.35
700-900	832	11.75
900-1100	457	6.46
1100 and Above	869	12.28
<b>Total</b>	<b>7,079</b>	<b>100</b>

### **Average Enrollments:**

<b>PRIMARY Enrollment Profile</b>		
Categories	Freq.	Percent
0-100	17,581	48.54
100-200	14,234	39.3
200-300	3,398	9.38
300-400	713	1.97
400 and Above	296	0.82
<b>Total</b>	<b>36,222</b>	<b>100</b>
<b>Middle Enrollment Profile</b>		
Categories	Freq.	Percent
0-100	374	4.47
100-200	2,431	29.06

<sup>5</sup> Using data from EMIS 2015-16

<b>200-300</b>	2,772	33.13
<b>300-400</b>	1,487	17.77
<b>400-500</b>	688	8.22
<b>500 and Above</b>	614	7.34
<b>Total</b>	8,366	100

We defined the following average enrollment benchmarks by looking at the clusters within which enrollment of an average school category falls in:

- Primary: 100
- Middle: 250
- High/Higher Secondary: 500

For these average categories of enrollment the average students for whom furniture is available is:

- Primary: 60.83 students,
- Middle: 172.91 students,
- High/Higher Secondary: 383.3 students,

Similarly, for these average categories of enrollment the average teachers for whom furniture is available is:

- Primary: 2.82 teachers,
- Middle: 8.48 teachers,
- High/Higher Secondary: 383.3 teachers,

For these average categories of enrollment the average building status of the school is:

- Primary: 0.38% of the average primary schools do not have satisfactory building
- Middle: 0.03% do not have satisfactory building
- High/Higher Secondary: 0.02% do not have satisfactory building

## Appendix B: Steps for simulation and typical school analysis

1. The simulations envelop two different methodologies and steps, the first is generating and running a version of the revised formula equation and the second is conducting a typical school analysis on the budget calculations generated by the formula.
2. For the simulations we follow the following steps:
  - a. We divide this step into 5 different sheets to source in/out data from:
    - i. **Data:** This includes selected variables from the Annual School Census latest dataset,
    - ii. **Parameters:** This includes the percentage differentiations between different heads of the Non Salary Budget,
    - iii. **School Individual Weights:** This allots weights to all different schools using Data and Parameters to be able to differentiate the different types of schools,
    - iv. **Overall Weights:** This includes the cost calculations that were done to calculate the weights,
    - v. **Budget Calculations:** This includes the final budget amounts which are sourced from school individual weights and parameters,
3. Once we have this final version of the formula calculations for each school we proceed on with the typical school analysis,
4. We categorized all the schools into the following types: Primary, Secondary, and High (High and Higher Secondary were bundled together).
5. We constructed an average enrollment analysis for each of the school types constructed in (1) which entailed the following steps:
  - (a) Using the average trend of enrollments for each category construct brackets which are effective to capture that trend,
  - (b) Use these brackets to ascertain what type of enrollment does an average school of each category has (Primary=100, Middle=250, High=500); the chosen brackets are highlighted in grey for the following tables:

PRIMARY Enrollment Profile		
Categories	Freq.	Percent
0-100	17,581	48.54
100-200	14,234	39.3
200-300	3,398	9.38
300-400	713	1.97
400 and Above	296	0.82
<b>Total</b>	36,222	100
Middle Enrollment Profile		
Categories	Freq.	Percent
0-100	374	4.47



<b>100-200</b>	2,431	29.06
<b>200-300</b>	2,772	33.13
<b>300-400</b>	1,487	17.77
<b>400-500</b>	688	8.22
<b>500 and Above</b>	614	7.34
<b>Total</b>	8,366	100

<b>Higher and Higher Secondary Enrollment Profile</b>		
<b>Categories</b>	<b>Freq.</b>	<b>Percent</b>
<b>0-100</b>	37	0.52
<b>100-200</b>	301	4.25
<b>200-300</b>	801	11.32
<b>300-400</b>	1,120	15.82
<b>400-500</b>	1,080	15.26
<b>500-700</b>	1,582	22.35
<b>700-900</b>	832	11.75
<b>900-1100</b>	457	6.46
<b>1100 and Above</b>	869	12.28
<b>Total</b>	7,079	100

6. Using the benchmark of average enrollments defined in 2(b), categorize how the following endowments in the NSB formula would look like for each category at the average enrollment benchmark:
  - (a) Average teachers for whom furniture is available,
  - (b) Average students for whom furniture is available,
  - (c) At the average enrollment benchmark how many schools have satisfactory building status
  
7. Construct a table on what does a school for each category receive at the average enrollment benchmarks highlighted in 2(b) for the following components of the NSB endowment:
  - (a) Fixed Schools Allocations,
  - (b) Student Retention Premium,
  - (c) Basic student entitlement,
  - (d) Furniture needs,
  - (e) Building operations,
  - (f) Total NSB Allocation,
  - (g) Any other further component.

## Appendix C: Weights Tables and Simulations

**Table 3: Component-wise proportion allocation**

	FSA (%)	BSE (%)	Furniture needs (%)	Buildings operations/ Acreage (%)	SRP (%)	Teacher Deficiency Indicator (%)	Mis. Fac. Indi. (%)
<b>1. NSB Current Formula</b>	19.7	22.4	14.9	22.8	20	0	
<b>2. Collapse FSA into BSA</b>	0	42.2	14.9	22.8	20	0	
<b>3. Add teacher deficiency indicator</b>	14.7	22.4	10.9	18.8	15	18	
<b>4. Add acreage</b>	14.7	22.4	10.9	31.9	20	0	
<b>5. Add acreage and deficiency</b>	11.7	22.4	10.9	21.9	15	18	
<b>6. Add missing facilities indicator</b>	14.7	22.4	10.9	18.9	15	0	
<b>7. Revise SRP</b>	19.7	22.4	14.9	22.9	20	0	
<b>8. Add Remoteness</b>	14.7	22.4	10.9	18.9	15	0	
<b>9. Complete (missing facilities indicator + acreage + remoteness + SRP Revised + teacher deficiency)</b>	13.7	13	10.9	13	13	13	

Note: The weights in the first row are provided as is by Rosalind and Vohra. SRP is not mentioned in the TA report; it was added later at the request of the PMIU. Our approach to weight assignment is that: a) the total should add to 100, b) we maintain as far as possible the proportions of the weights that Rosalind and Vohra have used. We do not imbalance the importance they have given to components. However, because we need to add new components (row 5 / Simulation 5), we change the weights to be able to accommodate the new components following the two principles mentioned above.

Simulation: **when a missing facilities indicator is added** (Rs)

	<b>Primary</b>	<b>Middle</b>	<b>High/ Higher secondary</b>
Fixed School Allocation	38,755	58,105	59,346
Basic Student Entitlement	29,668	72,722	1,58,074
Student Retention Premium	17,377	47,421	1,12,451
Furniture Needs	13,819	37,429	75,663
Building Operations	34,279	62,293	1,36,670
Missing Facilities	55,203	53,440	50,482
<b>NSB receipts: average by a typical school</b>	<b>1,89,104</b>	<b>3,31,413</b>	<b>592,688</b>
<b>NSB receipts total by all schools in category</b>	<b>6.8 billion</b>	<b>2.8 billion</b>	<b>4.2 billion</b>

Source: Note: receipts by all schools do not add up to 14.2 billion as our calculations are based on averages.

Simulation: **when acreage is added** (Rs)

	<b>Primary</b>	<b>Middle</b>	<b>High / Higher Secondary</b>
Fixed School Allocation	38755.97	58105	59345.61
Basic Student Entitlement	29668.61	72722.29	158074.2
Student Retention Premium	23169.9	63228.93	149935.3
Furniture Needs	13819.34	37429.09	75665.48
Building Operations	35355.56	64950.28	142181.1
<b>NSB receipts: average by a typical school</b>	<b>140,769</b>	<b>296,436</b>	<b>585,202</b>
<b>NSB receipts total by all schools in category</b>	<b>5.1 billion</b>	<b>2.5 billion</b>	<b>4.1 billion</b>

Note: receipts by all schools do not add up to 14.2 billion as our calculations are based on averages.

Simulation: **when SRP is revised** (Rs)

<b>NSB Budget Components</b>	<b>Primary</b>	<b>Middle</b>	<b>High / Higher secondary</b>
<b>Fixed School Allocation (FSA)</b>	50,560	75,066	76,698
<b>Student Retention Premium (SRP)</b>	27,424	56,380	186,559
<b>Basic Student Entitlement (BSE)</b>	28,441	68,651	148,485
<b>Furniture Needs</b>	22,348	44,588	78,347
<b>Building Operations</b>	29,651	70,738	148,173
<b>Total NSB received by an average school</b>	158,424	315,423	638,262
<b>Total NSB received by all schools in category</b>	5.7 Billion	2.6 Billion	4.5 Billion

Simulation: **when remoteness is added** (Rs)

	<b>Primary</b>	<b>Middle</b>	<b>High / Higher Secondary</b>
<b>Fixed School Allocation</b>	34,987	52,414	53,548
<b>Basic Student Entitlement</b>	26,887	78,181	1,42,320
<b>Student Retention Premium</b>	15,813	51,580	1,01,063
<b>Furniture needs</b>	12,517	41,100	68,452
<b>BUILDING OPERATIONS</b>	22,820	66,263	1,19,047
<b>DISTANCE</b>	60,243	55,453	0
<b>NSB received by an average school</b>	1,73,272	3,44,993	4,84,431
<b>NSB received by all schools in category</b>	6.2 Billion	2.9 Billion	3.4 Billion

## Appendix D: Literature Review

Public investment in education can go a long way in creating long term social and economic benefits for regional and local communities. The guiding principles of education financing are the same across the board in developed and developing countries: providing children with equal opportunity of access to schools and quality learning. Thus, ensuring equity in the provision of quality education is a key criterion of public education financing i.e. the uplift of children with disadvantages – special needs and low-income backgrounds, and under-resourced schools.

With the gradual shift towards the decentralization of public education, there has been an increase in the autonomy awarded to local communities and school management systems with regard to allocation and utilization of resources. It is vital that public funds be directed effectively in order to achieve increased student learning. Allocation methods should be able to align the available resources with school specific needs that allow for a smooth flow of operations and the procurement of sufficient educational/instructional material for students. In recent years, governments have adopted the use of formulae to disburse funds for non-salary expenditures to schools. The development of budget formulae has come about as a response to criticism regarding the misappropriation and lack of transparency surrounding public funding of education (Noe, 1986). Unequitable distribution of resources and inability of schools to generate sufficient revenue also contribute to the need for a formula to disburse these funds (Noe, 1986).

The components of school funding formulae can be divided into four broad categories: variables based on pupil numbers; variables identifying special needs of students; variables pertaining to the curriculum or educational programs; and school specific characteristics (Fazekas, 2012). In some countries, funds are allocated to schools, solely on the basis of the total number of pupils in each grade, e.g. in Poland and Brazil (Levacic and Downes, 2004). Student numbers are often weighted by student age or school level to account for different requirements of higher grades (e.g. Sri Lanka, Indonesia, and Ethiopia). Needs based variables are included to account for different requirements for teaching children with disabilities, including learning difficulties, as well as those coming from disadvantaged socio-economic backgrounds (Fazekas, 2012). Often, funding formulae also include allocations for special education programs such as music, languages and sports (Fazekas, 2012). School level variables that feed into the funding formula range from the size of the school and the state of school facilities to the relative isolation of the school community (Fazekas, 2012). Developed countries such as Canada and New Zealand use sophisticated socio-economic and isolation indices as measures for determining formula (Ross and Levacic, 1999).

While designing the non-salary budget formula, there are a few considerations that policy makers have to make. Ross and Levacic (1999) have posited that it is necessary to keep adequacy, efficiency, equity, simplicity and transparency, and integrity of the formula in mind while devising how to disburse funds. The principle of adequacy requires that the non-salary budget formula allocate enough funds to cover the school's spending needs. Ross and Levacic (1999) believe that a formula is efficient, such that it encourages schools to improve outcomes. As is the case in education systems where funding is linked to the number of students, schools have an incentive to increase enrolment and retain students, especially in the higher classes. The "directive function" of the budget formula may also manifest as efforts to improve the quality of teaching in schools and create an environment that is conducive to learning (Ross and Levacic, 1999). Equity concerns are of great importance while designing the budget formula. In

order to cover fixed costs incurred by schools, budget formulas must make special accommodations for small schools, where enrolment levels are low. In addition, the non-salary budget formula should promote equity by allocating more money to schools on the basis of the condition of their facilities, poverty of the local community and special needs (disabilities and difficulties in learning) of the enrolled schools.

According to Levacic and Downes (2004), transparency in the formula and resource allocation depends on the extent to which the stakeholders involved can understand the basis on which money is being distributed. It makes sense that education systems in developing countries look at the number of students enrolled in order to determine the allocation, as it is simple to understand. In developed countries, however, budget formulas are slightly more complex. Therefore, capacity building and teacher training is required in order to equip teachers to better engage with financial procedures.

The following table presents a summary of the non-salary budget formulas of some developed and developing countries, in light of the aforementioned cardinal principles of devising the formula.

	<b>Objective</b>	<b>Adequacy</b>	<b>Efficiency</b>	<b>Equity</b>	<b>Simplicity and transparency</b>
Sri Lanka <sup>6</sup>	Education Quality Inputs Scheme (2000), aimed at reducing disparities in allocation of resources and enabling schools to make decisions regarding spending	Needs-Based Unit Cost Resource Allocation Mechanism (NBUCRAM) – budget allocated for consumables, low cost equipment in schools and maintenance of equipment.	Allocation based on number of students, weighted by age/grade <sup>7</sup> . School based management system introduced for spending.	5% set aside for the most disadvantaged schools: [Determined by] recurring teacher shortages (40%), difficulty in access (6%), lack of facilities (30%), poverty of local community (24%)	Moderate level of complexity (multiple indicators used in formula)
Indonesia <sup>8</sup>	Bantuan Operasional Sekolah / Operational Funding Program (2005) to improve school resourcing and implementing school based management of funds	Fixed amount allocated per student (\$43), to be utilized for additional learning materials, temporary teachers, consumables, utilities and school maintenance.	Allocation based on number of grade -weighted students in the school. Role of district government limited – shift towards school based management of funds.	Schools no longer collected parental fees, freeing poorer students from paying fees	Simple formula using only number of students, according to the school level.
China <sup>9</sup>	Funding Guarantee Mechanism (FGM) to address lack of resources and funding in schools in rural areas	Fixed amount allocated per student, to be utilized for school facilities and utilities, teacher professional development activities, instructional material	Allocation based on number of students in each school level <sup>10</sup>	Schools in rural areas received additional funds – urban schools with higher levels of resources were not affected.	Simple formula using only number of students, according to school level
Ethiopia <sup>11</sup>	Abolishment of school fees to reduce disparity in access to	Fixed amount allocated per student to be utilized for learning and	Allocation based on the number of students weighted by grade.	Low income students receiving an advantage.	Simple formula at primary & secondary

<sup>6</sup> Mukherjee, I., Cabraal, A., & Terrado, E. (2005). Treasures of the education system in Sri Lanka: restoring performance, expanding opportunities and enhancing prospects. The World Bank

<sup>7</sup> Allocation on the basis of age-weighted, grade wise enrolment encourages schools to recruit and retain students in higher grades.

<sup>8</sup> Vernez, Georges, Rita Karam, and Jeffery H. Marshall. (2012). Implementation of School-Based Management in Indonesia. Santa Monica, CA: RAND Corporation. <https://www.rand.org/pubs/monographs/MG1229.html>

<sup>9</sup> OECD. (2016). Education in China: A Snapshot. <https://www.oecd.org/china/Education-in-China-a-snapshot.pdf>

<sup>10</sup> The amount allocated to each school was determined on the basis of the cost function, best-practice in schools and professional judgment from advisors. (Du, Y. and Sun, Z. (2008) Reforms of compulsory education financing in rural China. Beijing: Beijing Normal University Press.)

<sup>11</sup> UNICEF. (2009). Abolishing School Fees in Africa Lessons from Ethiopia, Ghana, Kenya, Malawi, and Mozambique.

	education and providing grants to schools to cover non-salary expenditures	operational expenditures. Minimal amount being disbursed, leading to operational inefficiencies with surges in enrolment	[US \$ 1 – grades 1 to 4, US \$ 1.76 – grades 5 to 8, US \$ 2.35 – grades 9 and 10]	Cost-sharing mechanisms implemented after grade 11, where costs of education would be shared b/w schools and parents depending on the latter's ability to pay.	level. Moderately complex formula determining resources higher secondary (community & household poverty levels given consideration)
Kenya <sup>12</sup>	Abolishment of school fees to achieve universal primary education, increase access to schools and opportunities for development	The size of the non-salary grant was well defined to cover a host of expenses (learning & training materials, operating costs)	Allocation based on the number of students in each school [US \$ 14/student]. School based management supported. Schools allocated funds for instructional materials and school equipment and maintenance, separately	Schools no longer collected parental fees, freeing poorer students from paying fees	Simple formula only using the number of students
Ghana <sup>13</sup>	Capitation Grant Scheme Strategy (2004) aimed at abolishing school fees to increase access and participation in education	The size of the grant to each school, was at a per capita basis, determined by the average school fees being charged nationwide.	Allocation based on the number of students, weighted by gender [US \$ 2.7 for boys, US \$ 3.88 for girls]. School based management of funds to implement school improvement plans was promoted.	Low income students receiving an advantage. Efforts made to bring more girls into schools – reduction in gender disparity in enrolment.	Simplest formula using only the number of students to allocate funds.
New Zealand <sup>14</sup>	Centrally Resourced Schools (CRS) – Financial reforms aimed at providing quality education and more effective and efficient school management in a	Operational grant allocated to each school, in addition to teacher salaries. To be used for curriculum enhancement, supplementary educational needs, and development and	Allocation of funds determined on the basis of grade wise enrolment, costs of utilities, rurality and isolation of school and a composite index of social disadvantage. <sup>15</sup>	Schools with social and location specific disadvantages receiving additional funds. Uplift of children with special needs	Complex formula using composite measures of socio-economic status and isolation index

<sup>12</sup> Ibid.

<sup>13</sup> UNICEF. (2009). Abolishing School Fees in Africa Lessons from Ethiopia, Ghana, Kenya, Malawi, and Mozambique.

<sup>14</sup> Ross, K. N., & Levacic, R. (Eds.). (1999). Needs-Based Resource Allocation: Via Formula Funding of Schools. UNESCO.

<sup>15</sup> Composite index of social disadvantage takes into account socio-economic indicators (such as household income and community poverty levels), ethnicity of the communities in the region and the number of children with special needs in under-resourced schools. (Ross and Levacic, 1999)



decentralized school system.	maintenance of school facilities		also made a priority.	
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The “integrity” of the formula is also a fundamental consideration in devising the non-salary budget formula (Ross and Levacic, 1999). The integrity of the formula depends on the data sources of the variables and the accuracy with which the measures are designed and data is collected. As the variables feeding into the formula have funding attached to them, school managements and district governments may try and manipulate the data being collected, in order to secure greater funding (Ross and Levacic, 1999)

Levacic et al. (2000) have stated that while these considerations are all equally important, the criteria for funding decisions are not “mutually consistent”. While increased student enrolments are positive indicators of school performance, in attempts to get more funding, schools may compromise on quality of learning as the former does not factor into the national non-salary budget formula. In addition, allowing for supplementary teaching and learning needs, e.g. including isolation and social disadvantage of students and schools, may increase the equity function of the formula. However, the formula becomes more complex, and hence less transparent. Thus, there is no ‘best-practice’ formula that can be applied across the board in developed and developing countries. All formula considerations must be made keeping in mind the country specific policy objectives and the intended purpose of the non-salary budgets.

## Appendix D: Data from school plans

<b>Planned Interventions*</b>	<b>Freq.</b>	<b>Percent</b>
Provide free uniforms	1,355	57.4
Conduct awareness event	1,051	44.6
Create ECE classroom	691	29.3
Provide free bags	672	28.5
Engage with village leaders	548	23.2
Print pamphlets	500	21.2
Buy furniture, chairs, tables for students	380	16.1
Paint school	367	15.6
Provide free shoes	351	14.9
Provide transport	335	14.2
Others, Misc, and Missing	221	9.4
Provide free stationary	184	7.8
Hire part time coach	171	7.2
Build washrooms	151	6.4
Co-ordination with parents/Parent Teacher Conference	151	6.4
Provide free meals	144	6.1
Hire early grade helper	113	4.8
New Classrooms	113	4.8
Install water cooler	90	3.8
Building Construction & Repairs	88	3.7
Build boundary wall	84	3.6
Involve School Council/Committee	84	3.6
Garden Plants/Swings	70	3.0
Decoration of School	68	2.9
New Teachers	53	2.2
Child Friendly Environment	51	2.2
E-Learning	41	1.7
Mentor the teachers	34	1.4
Transfer head teacher	32	1.4
Co-Curricular	32	1.4
Transfer teacher	30	1.3
Increase Enrollment	29	1.2
Survey	29	1.2
Scholarship for the Students	26	1.1
Provide Peon	23	1.0

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