Measuring Quality Standards of Secondary Schools by Rubrics Methods achieving the targets of Sustainable Development Goals (SDG)

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Abstract— There are 18905 secondary schools are currently operating under administrative management of Directorate of Secondary and Higher Education (DSHE). Near about 10 million students are currently enrolled in these secondary schools. It is difficult to provide overall educational supports to these institutions for government, especially to identify which institution needs what kinds of support. To overcome these problems, Secondary School Quality Standard was developed with 31 indicators covering 7 major areas which are (i) Teaching facilities and Equipment; (ii) Student/Teacher Ratio; (iii) Head Teacher Qualifications; (iv) Teacher Qualifications; (v) SMCs composition and procedures; (vi) School Financing and (vii) Assessment. The SSQS has been designed in line with the policy of achievement of Sustainable Development Goals by 2030.

Web-based data management technique has been used to collect, verification, validation of educational real-time data-sets from secondary schools. All institutions have individual access facility to update and export data from the system. Web-based software has been developed to measure the SSQS indicators to identify help needs for a specific secondary school.

Index Terms— Secondary School Quality Standard (SSQS), Education Information Management System (EMIS), Sustainable Development Goal.

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1 INTRODUCTION

After a five-year cycle of compulsory primary education, the secondary education in Bangladesh is comprised of seven (3+2+2, shown in the above figure :) years of schooling. The first three years is referred to as junior secondary (grades VI to VIII), the next two years as secondary (grades IX and X) and the rest two years as higher secondary (grades XI and XII). The official age for studying secondary education is 11-15 years. However, as some children starts their primary education late and hence completes it late, as a result, a good portion of secondary school students is over aged. There are different types of secondary level educational institutions in Bangladesh. These may be government or privately management, secular or regional based Bangla or English medium and vocational. Of the secondary school, the majority are privately managed. There are six types of school currently operating under the Directorate of Secondary and Higher Education (DSHE). These are junior secondary school, government school, non-government school, combined school and college, dakhil and alim madrasah. The first four are under a general stream and the remaining two are under a religious education stream. In the combined school-cum-college and alim madrasa, secondary section is a part of higher secondary institutions.

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1.1 Administrative Structure of Secondary Education

Secondary education administration in Bangladesh is on three levels: the central level which is managed by DSHE; the zonal level, managed by Zonal Education Office (ZEO); the district level, managed by District Education Officer (DEO) and Upazilla level, managed by Upazilla Secondary Education Office (USEO). MoE and DSHE are responsible for overall policy development, planning, monitoring and evaluation in the secondary education sector in the country.

The Directorate of Secondary and higher Education under MoE, with its direct line of command through the zonal, district and Upazilla offices maintains full administrative and financial authority and also holds responsibility for implementing and monitoring education programs.

At the zonal level, zonal director take responsibility for coordinating, monitoring, and supervising the school-level teaching/learning as well as planning within each region. DEOs located at the most decentralized level in the administrative hierarchy; manage the planning and implementing of educational development activities. They also supervise and monitor teaching/learning processes at the district level in accordance with national policies, programmes, and the directives of the ministry, directorate and concerned zonal director.

In addition to these administrative bodies, USEO and school management committee (SMC) also play important roles. Upazilla Secondary Education offices (USEO) are established at each Upazilla/Thana. Upazilla Secondary Education Offices provide professional and academic support and services to the school within the respective Upazilla/Thana. Twenty five Thana Secondary Education Offices have been established in 4

metropolitan cities and TSEO provide professional and academic support and services to the school within the respective Thana .At the school level, an SMC and in some cases governing body/adhoc committee is set up and composed of selected representatives, including parents, community members and school administrator. The committee is responsible for the overall management, supervision, and functioning of the school.

1.2 Secondary Education Management by Government Authority

Table 1

Functions	Responsible body
General Secondary Education	Ministry of Education (MoE) Directorate of Secondary and Higher Education (DSHE)
Secondary Level Technical and Vocational Education	Ministry of Education (MoE) Directorate of Technical Education (DTE)
Private Education	Ministry of Education Directorate of Secondary and Higher Education
Curriculum Development and Research	Ministry of Education National Curriculum & Text Book Board Directorate of Secondary and Higher Education
Teacher management	Ministry of Education Directorate of Secondary and Higher Education Non-government Teachers' Registration and Certification Authority (NTRCA) Teachers' Training College(TTC) Higher Secondary Teachers' Training Institution (HSTTI)
Learning Assessment	Bangladesh Examination Development Unit (BEDU) Board of Intermediate and Secondary Education (BISE) National Curriculum and Textbook Board (NCTB) Directorate of Secondary and Higher Education (DSHE)
Budgeting	Ministry of Education (MoE) Ministry of Finance (MoF) Directorate of Secondary and Higher Education (DSHE) University Grant Commission (UGC)
Planning	Ministry of Education (MoE) Directorate of Secondary and Higher Education (DSHE) University Grant Commission (UGC) Planning Commission
EMIS	Directorate of Secondary and Higher Education (DSHE) Bangladesh Bureau of Educational Information and Statistics(BANBEIS)
Performance Based Management	Directorate of Secondary and Higher Education (DSHE) National Academy for Education Management (NAEM) National Curriculum and Textbook Board (NCTB)

2. DATA CAPTURE TOOLS

Since the introduction of computers, there has been an evolution of improvements in data collection methods corresponding to advances in technology. Specifically, there have been dramatic advances in the development of web-based data collection instruments. The web-based data collection method was introduced in the mid 1990s instead of manual paper based data management system.

One of the most significant advancements in remote entry is in the process of entering data into a form accessed on the web. This method has become a popular way to collect data because access to the internet has expanded dramatically, allowing data to be entered directly into a central database. It also provides less dependency on specific types of equipment for entering data. The web-based methods allow for instant editing checks as responses are entered and if desired, allows for many of the traditional techniques for inputting responses such as textboxes, dropdowns, checkboxes or other styles that are available through web-programming without additional software installed on the client other than a web browser.

Active Server Pages (ASP.net) has been used to produce applications on the server that execute at the time of connection to the web-site. Dynamic HTML and Cascading Style Sheets (CSS) gave users the ability to better control the appearance of the web forms and graphical images. These languages were used to develop server applications that more extensively examine the data for errors when it is submitted by the remote computer.

The online data collection system was considered for the following reasons:

➢ Web-based server architecture is more easily deployed than a client server system;

➢ Web-based software is particularly good at enforcing certain aspects of data quality. Edit checks programmed into the software can make sure data meets certain required formats, ranges, etc. before the data is accepted into the database.

➢ Web-based IMS systems can provide near real-time information to user instantly;

➢ A web based system can be deployed easily over the Internet

➢ It is easier to maintain and virus protection is only needed for servers

➢ It is paperless, cost effective and time saving system;

➢ Data analysis in some cases is automatically done by report generating software in this architecture.

2.1 Architectural Design of SSQS software system:

SSQS module is gigantic and very comprehensive web-based data management System. It is the repository of all through information of secondary schools.

2.1.1 What is 3-tier architecture system?

Three-tier architecture is a client-server architecture in which the functional process logic, data access, computer data storage and user interface are developed and maintained as independent modules on separate platforms. Three-tier architecture is a software design pattern and well-established software architecture.

Three-tier architecture allows any one of the three tiers to be upgraded or replaced independently. The user interface is implemented on a desktop PC and uses a standard graphical user interface with different modules running on the application server. The relational database management system on the database server contains the computer data storage logic. The middle tiers are usually multitier. The three ties are in three-tiers are:

- Presentation Tier: Occupies the top level and displays information related to services available on a website.

This tier communicates with other tiers by sending results to the browser and other tiers in the network.

- Application Tier: Also called the middle tier, logic tier, business logic or logic tier, this tier is pulled from the presentation tier. It controls application functionality by performing detailed processing.
- Data Tier: Houses database servers where information is stored and retrieved. Data in this tier is kept independent of application servers or business logic.
- Each tier (Presentation, logic, data) should are independent and not expose dependencies related to the implementation;
- Unconnected tires would not communicate;
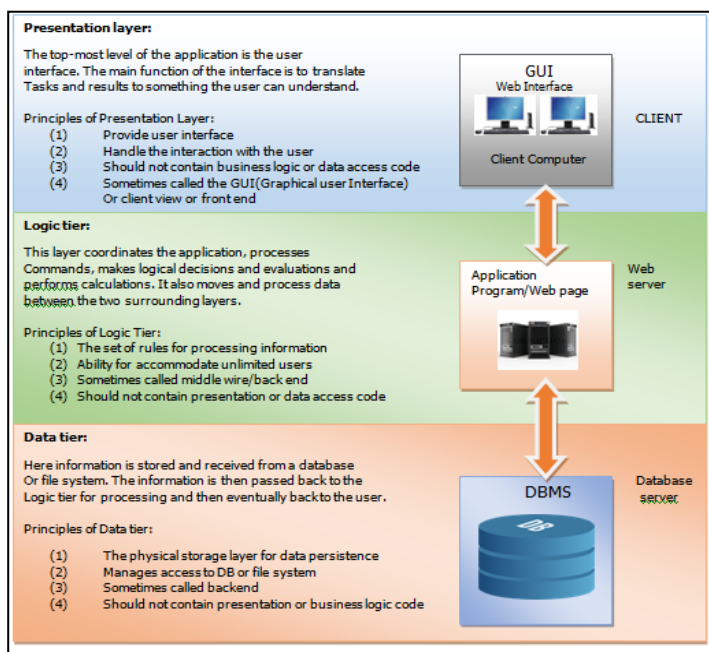- Change in platform affects only the layer running on that particular platform;

Figure 1: Three Tier architecture
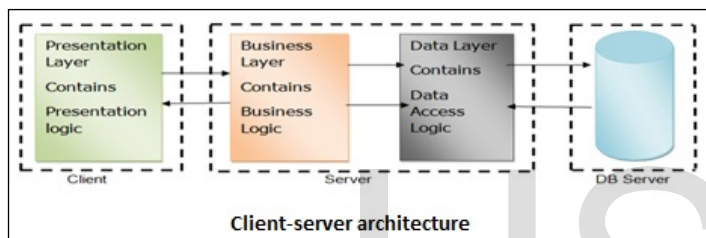
2.1.2   A typical view of 3-tier architecture

The brief description and activities of different layer has been described and viewed in the image below:

Figure 2: A typical view of 3 Tier architecture
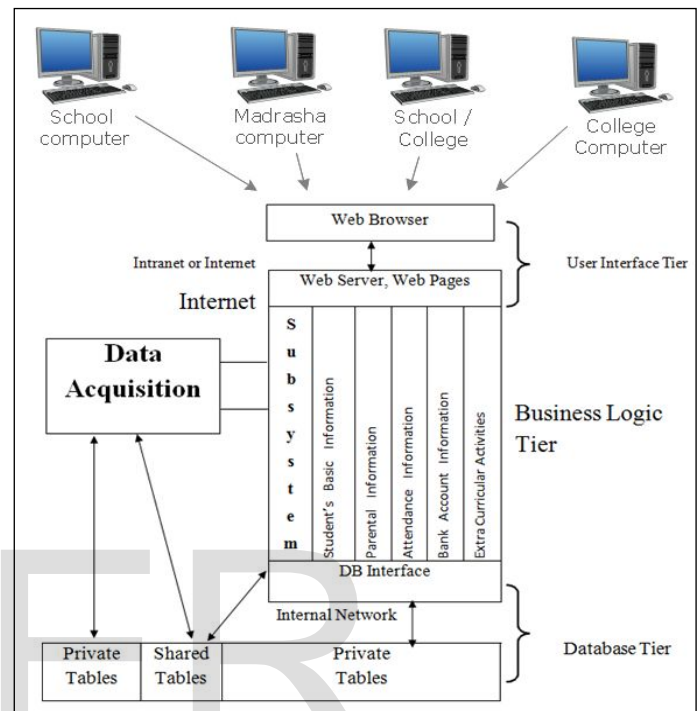

2.1.3   Software Technology

The system was developed under web based platform. The

industry standard relational database especially Oracle database software was considered for the system. .Net platform was used to develop the front-end application software

2.1.4   Architectural Overview of SSQS module

Figure 3: Architecture overview of SSQS module

## 3   DATA COLLECTION PROCEDURE

Data collection is a key component of the Education Management Information System (EMIS). It begins with designing of questionnaires to gather raw data to address important issues. After the school data are collected and transferred to the SSQS computing environment, the next steps are to validated and process data, and generate reports for decision makers and planners. The computing environment of SSQS is designed and developed with an aim of collection, organization, integration and analyze data that are being gathered online from secondary school. During data collection, there is need to focus on the quality, accuracy and reliability of data, since policies and decisions are to be developed based on the collected data.

A total amount of 18905 schools were entered data online to SSQS web-based software system in DSHE EMIS central server for the year 2016. They are entering detailed institutional data-sets according to the SSQS indicators. The year-wise SSQS data acquisition was completed with the direct supervision of the institutional head. Separate user name and password are provided to all sorts of institutions. Institutional heads are able to adjust data into this system as and when necessary. The field level pre-trained educational stakeholders help school's head closely on the data capture system. The counseling was available over cell phone in this regards to institute's head from upazila, district. Zonal offices and also from Head quar-

ters.

The data collection under EMIS computing system is undertaken via SSQS Data Capture Formats (DCF), which contains static and dynamic data of all secondary schools. The static data involves the information on the school location, type, management, and the level of institutions and many others. The dynamic data covers the information on enrolment, repeaters, etc. that schools are inserted each year in the DCFs that has the static data pre-filled from previous year and are tasked with updating the dynamic data. In case, there is any change in the status of pre-filled static values, teachers are privileged to change the value by new information. It is advised that the school keeps all records required to fill the DCFs of SSQS module readily available and to provide accurate data in a timely manner. Hence, institutionalization of school records and their timely accumulation is a key to improving the quality and integrity of data-sets collected via SSQS web-based module. Holistic Data collection process has been shown in the below picture:

Figure 4: EMIS Data Collection Process
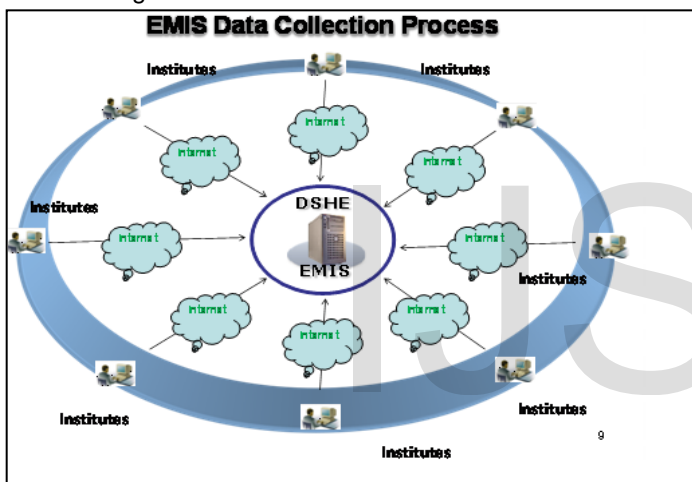
4   THE DATA FLOW OF SSQS WEB-BASED DATA MANAGEMENT SYSTEM
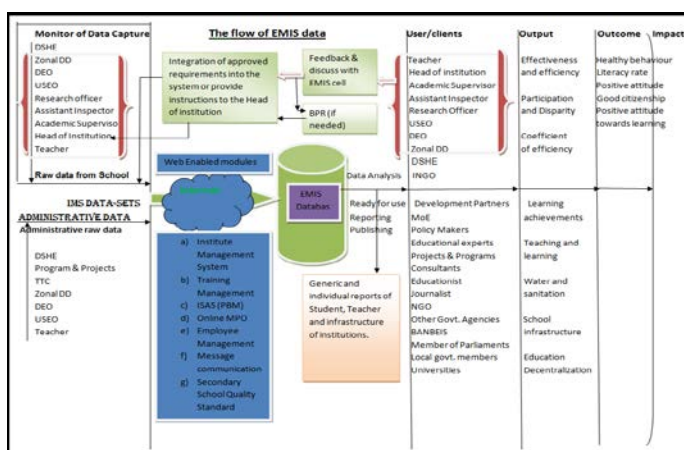
5.   DATA VALIDATION

Data validation is defined as the inspection of all the collected data for completeness and reasonableness, and the elimination of erroneous values. This process transforms raw data into validated data. The validated data are then processed to produce the required summary reports for analysis. Therefore, data must be validated as soon as possible immediate after being updated from institutions.

Data can be validated either manually or automatically (computer-based). Both types of data validation procedures are being used in the DSHE data management system. Data validation is intended to provide certain well-defined guarantees for fitness, accuracy, and consistency for any of various kinds of user input into an application or automated system. Data validation rules can be defined and designed using any of various methodologies and be deployed in any of various contexts in the Data Capture Formats.

Basically, the data validation strategy of the SSQS data-sets is self-driven and under controlled by the secondary education administrative management system. It does not need to hire third party to valid the data-sets. As the data update system is real-time and it goes round the year. Field level educational stakeholders are the key players to inspect data for checking accuracy during their visiting period of schools. Data Validation is a part of responsibility of field level officials generally they do during school inspections thereby the accuracy of data is ensured.

6   INDICATORS OF SECONDARY SCHOOL QUALITY STANDARDS

The standard covers 7 major areas and 35 indicators of secondary education system. The indicators of Secondary School Quality Standard in the area of (i) teaching facilities & equipment, (ii) student /teacher ratio, (iii) head teacher and teacher qualification, (iv) SMCs composition and procedures, (v) school financing, and assessment which is stated below:

Table 2

Major Area	Indicators
1. Teaching Facilities	
(a) School Area	• One acore (4,840 sq. yards)
(b) Boundary Wall	• Pacca wall with a gate
(c) School Building	Pacca Building • Well maintained
(d) Class Room	• Each classroom of 500sq.ft.; • Pacca partition wall; and

Major Area		Indicators
		• Separate room for each class/section
(e)	Library Room	• Pacca library room of 500sq.ft.
(f)	ICT Room	• Separate ICT room of 500 sq.ft.
(g)	Laboratory Room	• Separate laboratory rooms, one each for Physics, Chemistry, Biology and Maths, each of 500 sq.ft.
(h)	Common Room	• For uni sex school one room of 500sq.ft.and • For co-education school two rooms each of 500 sq.ft.
(i)	Playground	• Length: 100 yards (90m) X Width: 50 yards (45m) • Plane surface: Useable with grass • Garden @20%of school area.
(j)	Office Rooms	• Head Master's Room 500sq.ft; • Office Room 500 sq.ft.; and • Teachers' Room 750sq.ft. • Staff Room 250sq.ft. • Store room 500 sq.ft.
(k)	Toilet	• One Toilet for each 50 students; • Separate Toilet for boys and girls;
(l)	Classroom Furniture per class/section	• 10 sets benches (each set of one high and one low), each set for 4 learners • One chair and one table; and • One usable writing board.
(m)	Office room Furniture	• One table and 7 chairs for H/M room; • Two tables and 4 chairs for office room; and • One desk with a chair and a cabinet for each teacher; and • 5 Almirahs and 5 Cabinets
(n)	Library Furniture	• Table and bench for 50 students; • One table and one chair for librarian; and • Shelfs for 3000 books.
(o)	Potable Water	• One tap for each 50 students; or One pump tube-well for each 75 students.
(p)	Electrical System	• Electricity is available in school • All rooms have electric lights • All rooms have electric fans
Equipment		
(p)	Common Teaching Aids	Maps, Charts, Models, Geometry Box.

Major Area		Indicators
(q)	Multimedia and Computers	• 10 Computers/Laptops; • Printer – 1; • Modems/Wi-Fi; and • Multimedia Projector – 2
(r)	Science Equipment	• All equipment for General Science; *Applicable for School having Science Group*: • All equipment for teaching Physics, Chemistry, Biology and Advance Mathematics.
(s)	Physical Education Equipment	• Football, Volleyball and Cricket set,
(t)	Arts and Crafts Materials	• Art papers, Painting brass and • Colour, …………………..,
(u)	Musical Instrument	• Harmonium, Tablas and Pipe, …………….. ……………………………….
(v)	Books and Journals in Library	• 2000 books covering supplementary reading materials,reference book, novel, fiction, biography, travel story.
(w)	Common Room Equipment	• Table Tanis,Carom Board, Chess,
2.	**Teacher-Student Ratio**	• Teacher: Student 1:30 • Student per class 40
3.	**Head Master**	
(a)	Educational Qualification	• Master degree in Education with Hons.in Education Or Bachelor degree with second class or equivalent
(b)	Professional Qualification	• B.Ed.(for those who has no M.Ed)
(c)	Experience	• 8 years as teacher; • 2 years as Assistant Head Master • Management training of 15 days in total
4.	**Teachers**	
(a)	Educational Qualification	• Bachelor degree with second class or equivalent; and • Relevant subject(s) studied at Bachelor level;
(b)	Professional Qua-	• Bachelor of Education (B.Ed.) with second class or equivalent.

Major Area	Indicators
lification	
(c) Registra-tion	• Registered under NTRCA
(d) Continuous Profes-sional De-velopment	• Participated in 15 days training in total
5. SMC Composi-tion and Pro-cedures	• School has regular SMC; • SMC meetings are held regular-ly; • SMC members carry out their functions; and • SMC elections are held as per rule regularly.
6. School Fi-nancing	• School collects fees from the students regularly; • School gets recurrent income from its assets; • School pays part of the salary to MPO teachers and staff regu-larly; • School pays full salary to Non-MPO teachers and staff regular-ly; • Teachers and staff get MPO salary as per rule; and • Teachers and staff get MPO salary on time.
7. Assessment	• JSC pass rate of the school is equal to or higher than the Board's pass rate; • Number of GPA 4 to 5 receivers from the school is equal or higher than that the national average per school; • SSC pass rate of the school is equal to or higher than the Board's pass rate; and • Number of GPA 4 to 5 receivers of the school is equal to or higher than national average per school.

6.1 Analysis Methodology

"Rubrics" offer a process for making explicit the judgments in an evaluation and are used to judge the quality, the value, or the importance of the service provided by Secondary Schools. Rubrics, therefore, will help to analysis and eva-luate SSQS indicators more objectively.

Rubrics is the internationally recognized educational data analysis and evaluation methodology through which Sec-

ondary schools are categorized into "below standard", "Meets Standards" and "Exceeds Standards".

The SSQS indicators has been designed aiming to develop a guideline policy for government to achieve the Sustainable Development Goals 4 (SDG4) and providing information to top management on progress of achievement of SDG4. The targets of SDG 4 are following:

- By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous people and children in vulnerable situations.
- Build and upgrade education facilities that are child disability and gender sensitive and provide safe, non-violent, inclusive and effective learning envi-ronment for all.
- By 2013, sustainability increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, de-cent jobs and entrepreneurship.

6.2 Rubrics Method for Assessing SSQS Indicators:

Below a table with "rubrics" with the current standards as "meets standard" and rubrics for "below standard" and "ex-ceeds standard" added for each indicator. The indicators will be used to tabulate an overall score for each school in order to prioritize the schools that need the most help.

Table 3

Major Area	Indi-cators	Be-low Stan-dards (1 point)	Meets Stan-dards (2 points)	Ex-ceeds stan-dards (3 points)
Teaching Facili-ties				
School Area	One acore (4,840 sq. yards)	Less than one acre	One acre to two acres	More than two acres
Boun-dary Wall	Pacca wall with a gate	Only partial wall or	Pacca wall with	Wall made of other

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
		no wall at all	gate around whole school compound	strong material with lockable gate
School Building	Pacca Building Well maintained	Buildings in bad shape, with cracks not maintained, broken or missing windows or doors	All buildings minimum pacca in good condition (no cracks, no broken windows or doors, well maintained)	All buildings in excellent condition, new or very well maintained. Doors and windows intact
Class Room	Each classroom of 500 sq.ft.; Pacca partition wall; and Separate room for each class/section	Less than 75% of classrooms 500 sq. ft. Partition walls not made of pacca	Minimum 75% of rooms at least 500 sq. ft. One room for each class/section. Minimum four subject based rooms	95% of rooms at least 500 sq. ft. Rooms for all classes. More than six subject rooms
Library Room	Pacca library room of 500 sq.ft.	Library less than 500 sq ft or no library	Library minimum 500 sq. ft	Library minimum 1.000

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
		room at all		sq. ft.
ICT Room	Separate ICT room of 500 sq.ft.	ICT room less than 500 sq. ft or no ICT room at all	Minimum one ICT room of minimum 500 sq. ft.	ICT room more than 1.000 sq ft. or several ICT rooms
Laboratory Room	Separate laboratory rooms, one each for Physics, Chemistry, Biology and Maths, each of 500 sq.ft.	Less than four subject based rooms of 500 sq. ft. each	Minimum four subject based rooms of 500 sq. ft. each	More than six subject based rooms of 500 sq. ft or more each
Common Room	For uni sex school one room of 500 sq.ft.and For co-education school two rooms each of 500 sq.ft.	Common rooms smaller than 500 sq. ft. or missing	For uni sex school one room of 500 sq.ft. For co-ed school two rooms, each of minimum 500 sq.ft.	For uni sex school more than one room of 500 sq.ft. For co-ed school more than two rooms, each of minimum 500 sq.ft
Playground	Length: 100	Playground	Playground	Playground

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
d	yards (90m) X Width: 50 yards (45m) Plane surface: Useable with grass Garden @20%of school area.	smaller than 5000 yards. Surface not plane or grass covered. Garden less than 20% school area	at least 5.000 yards. Surface plane and grass covered. Garden area more than 20% of school area	at least 10.000 yards. Surface plane and grass covered. Garden area more than 30% of school area
Office Rooms	Head Master's Room 500 sq.ft; Office Room 500 sq.ft. Teachers' Room 750 sq.ft. Staff Room 250 sq.ft. Store room 500 sq.ft.	Head Master's Room less than 500 sq.ft; Office Room less 500 sq.ft. Teachers' Room less 750 sq.ft. Staff Room less than 250 sq.ft. Store room less than 500 sq.ft. Or, total area of all less	Head Master's Room minimum 500 sq.ft; Office Room minimum 500 sq.ft. Teachers' Room minimum 750 sq.ft. Staff Room 250 sq.ft. Store	Head Master's Room minimum 750 sq.ft; Office Room minimum 1.000 sq.ft. Teachers' Room minimum 1.250 sq.ft. Staff Room 500 sq.ft. Store-room 1.250 sq.ft.

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
		than 2.500 sq. ft.	room 500 sq.ft. Or, total area of all minimum 2.500 sq. ft.	Or, total area minimum 4250 sq.ft.
Toilet	One Toilet for each 50 students; Separate Toilet for boys and girls;	One toilet shared by more than 50 students	Minimum 1 toilet for 50 students, separate for boys and girls	Minimum 2 toilets for 50 students, separate for boys and girls
Classroom Furniture per class/section	10 sets benches (each set of one high and one low), each set for 4 learners One chair and one table; and One usable writing board.	Less than 10 sets of benches (one high and one low), each set for 4 learners Less than one chair and one table Writing board in bad condition.	Minimum 10 sets of benches (each set of one high and one low), each set for 4 learners Minimum one chair and one table One usable writing board.	Minimum 20 sets of benches (each set of one high and one low), each set for 2 learners Minimum one chair and one table Usable writing board/white board Shelf for storage
Office	One ta-	Less than	Mini-	More

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
room Furniture	ble and 7 chairs for H/M room; Two tables and 4 chairs for office room; and One desk with a chair and a cabinet for each teacher; and 5 Almirahs and 5 Cabinets	one table and 7 chairs for H/M room; Less than two tables and 4 chairs for office room; Less than one desk with a chair and a cabinet for each teacher Fewer than 5 Almirahs and Cabinets	mum one table and 7 chairs for H/M room; Minimum two tables and 4 chairs for office room; Minimum one desk with a chair and a cabinet for each teacher 5 Almirahs and 5 Cabinets	than one table and 10 chairs for H/M room; More than four tables and 8 chairs for office room; Minimum one desk with a chair and a cabinet for each teacher Minimum 5 Almirahs and 10 Cabinets
Library Furniture	Table and bench for 50 students; One table and one chair for librarian; and	Less than one table and bench for 50 students; Less than one table and one chair for librarian;	Minimum one table and bench for 50 students; Minimum one	Minimum one table and bench for 25 students; Minimum two tables and four

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
	Shelfs for 3000 books.	Shelfs for less than 3000 books. No library at all	table and one chair for librarian; Shelfs for minimum 3000 books.	chairs for librarian; Shelfs for minimum 5000 books.
Potable Water	One tap for each 50 students; or One pump tube-well for each 75 students.	Less than one tap for each 50 students; or One pump tube-well for more than 100 students.	Minimum one tap for each 50 students; or One pump tube-well for each 75 students.	Water available in more than one tap for each 25 students; or One pump tube-well for each 50 students
Electrical System	Electricity is available in school All rooms have electric lights and one socket All rooms have electric fans	Electricity is not available in the school or with frequent cuts All rooms do not have electric lights All rooms do not have electric	Electricity is available in the school without frequent cuts All rooms have electric lights and one socket All rooms	Electricity is always available in the school All rooms have electric lights and at least two sockets All rooms have six electric fans or

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
		fans	have minimum four electric fans	A/C
Equipment				
Common Teaching Aids	Maps, Charts, Models, Geometry Box.	Maps, Charts, Models, Geometry Box etc are not available or in bad condition.	Maps, Charts, Models, Geometry Box etc are available and in good condition.	Maps, Charts, Models, Geometry Box are easily available, in good use and in good condition.
Multimedia and Computers	10 Computers/Laptops; Printer – 1; Modems/Wi-Fi; and Multimedia Projector – 2	Less than 10 PCs/Laptops; No functioning Printer; Modems/Wi-Fi not functioning well, or disconnected; Only one or no Multimedia Projectors	Minimum 10 PCs/Laptops; Minimum one functioning Printer; Functioning, connected Modems/Wi-Fi; Minimum two Multi-	Minimum 20 PCs/Laptops; Minimum one functioning Printer/Scanner/Copier; Well-functioning, connected Modems/Wi-Fi; Multimedia Projectors in
			media Projectors	half of classrooms
Science Equipment	All equipment for General Science; *Applicable for School having Science Group*: All equipment as per curriculum for teaching Physics, Chemistry, Biology and Advance Mathematics.	Not all equipment for General Science available; *(Applicable for Schools having Science Group)* Not all equipment as per curriculum for teaching Physics, Chemistry, Biology and Advance Mathematics.	All equipment for General Science; *(Applicable for Schools having Science Group)* All equipment as per curriculum for teaching Physics, Chemistry, Biology and Advance Mathematics.	More equipment tan the minimum standard for General Science; *(Applicable for Schools having Science Group)* More equipment than required as per curriculum fo teaching Physics, Chemistry, Biology and Advance Mathematics.
Physical Education Equipment	Football, Volleyball and Cricket set available	Football, Volleyball and Cricket set not all available	Football, Volleyball and Cricket set,	Football, Volleyball and Cricket sets all available plus other sports equip-

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
				ment
Arts and Crafts Materials	Art papers, Painting brass; Colour all available	Art papers, Painting brass and Colour not available	Art papers, Painting brass and Colour all available	Art papers,Painting brass, Colour and other Arts and Crafts materials available
Musical Instrument	Harmonium, Tablas and Pipe all available	Harmonium, Tablas and Pipe not all available	Harmonium, Tablas and Pipe available	Harmonium, Tablas, Pipe and other musical instruments available
Books and Journals in Library	2000 books covering supplementary reading materials, reference books, novel, fiction, biography, travel stories available	Less than 2000 books covering supplementary reading materials, reference books, novels, fiction, biography, travel stories available	2000 books covering supplementary reading materials, reference books, novels, fiction, biography, travel stories available.	More than 4000 books covering supplementary reading materials, reference books, novels, fiction, biography, travel stories available
Common Room Equip	Table Tennis, Carom Board,	Table Tennis, Carom Board,	Table Tennis, Carom Board,	Table Tennis, Carom Board,

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
ment	Chess available	Chess not all available	Chess all available	Chess and other games all available
Teacher-Student Ratio	Teacher: Student 1:30 Student per class 40	Teacher-Student Ratio higher than 1:30 Average Student per class exceeding 40	Teacher-Student Ratio 1:30 Average Student per class note exceeding 40	Teacher-Student Ratio less than 1:30 Average Student per class less than 35
Head Master				
Educational Qualification	Master degree in Education with Hons.in Education Or Bachelor degree with second class or equivalent	Bachelor degree with second class or equivalent, or less	Minimum Master degree in Education with Hons.in Education or Bachelor degree with second class or equivalent	Master degree in Education with Hons.in Education
Professional Qualification	B.Ed.(for those who have no M.Ed)	Less than B.Ed	B.Ed.(for those who have no M.Ed)	Minimum M.Ed
Experience	8 years as teach-	Less than 8 years	Minimum 8	Minimum 12

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
	er; 2 years as Assistant Head Master Management training of 15 days in total	as teacher; Less than 2 years as Assistant Head Master; Management training of less than 15 days in total	years as teacher; 2 years as Assistant Head Master, and; Management training of minimum 15 days in total	years as teacher; 4 years as Assistant Head Master, and; Management training of minimum 25 days in total

Teachers

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
Educational Qualification	Bachelor degree with second class or equivalent; and Relevant subject(s) studied at Bachelor level;	Less than 50% have Bachelor degree with second class or equivalent; and/or Relevant subject(s) studied at Bachelor level;	75% of teachers have Bachelor degree with second class or equivalent; and Relevant subject(s) studied at Bachelor level;	75% of teachers have Bachelor and 25% Master degree with second class or equivalent; and Relevant subject(s) studied at Bachelor level;
Professional Quali-	Bachelor of Education (B.Ed.)	Less than 50% have Bachelor	75% have Bachelor of	100% have minimum

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
fication	with second class or equivalent.	of Education (B.Ed.) with second class or equivalent	Education (B.Ed.) with second class or equivalent	Bachelor of Education (B.Ed.) with second class or equivalent
Registration	Registered under NTRCA	All teachers not registered under NTRCA	All teachers registered under NTRCA	All teachers registered under NTRCA
Continuous Professional Development	Participated in 15 days training in average per teacher	Participated in less than 15 days training in average	Participated in minimum 15 days training in average	Participated in more than 20 days training in average
SMC Composition and Procedures	School has regular SMC; SMC meetings are held regularly; SMC members carry out their functions; and SMC elections are held as per rule reg-	School has no regular SMC; SMC meetings are not held regularly; SMC members do not carry out their functions; and SMC elections	School has regular SMC; SMC meetings are held regularly; SMC members carry out their functions; and SMC	School has regular and active SMC; SMC meetings are held regularly; SMC members carry out their functions; SMC elections are

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
	ularly.	are not held as per rule regularly.	elections are held as per rule regularly.	held as per rule regularly; and School has PTA
School Financing	School collects fees from the students regularly; School gets recurrent income from its assets; School pays part of the salary to MPO teachers and staff regularly; School pays full salary to Non-MPO teachers and staff regularly; Teachers and staff	School does not collect fees from the students regularly; School does not get recurrent income from its assets; School does not pay part of the salary to MPO teachers and staff regularly; School does not pay full salary to Non-MPO teachers and staff regular-	School collects fees from the students regularly; School gets recurrent income from its assets; School pays part of the salary to MPO teachers and staff regularly; School pays full salary to Non-MPO teachers and	School collects fees from the students regularly; School gets recurrent income from its assets; School always pays the salary to MPO teachers and staff regularly; School always pays full salary to Non-MPO teachers and staff regularly; Teachers

Major Area	Indicators	Below Standards (1 point)	Meets Standards (2 points)	Exceeds standards (3 points)
	get MPO salary as per rule; and Teachers and staff get MPO salary on time.	ly; Teachers and staff do not get MPO salary as per rule; Teachers and staff do not get MPO salary on time	staff regularly; Teachers and staff get MPO salary as per rule; Teachers and staff get MPO salary on time	and staff always get MPO salary as per rule; Teachers and staff always get MPO salary on time
Assessment	JSC pass rate of the school is equal to or higher than the Board's pass rate; Number of GPA 4 to 5 receivers from the school is equal or higher than that the national average per school; SSC pass rate of the	JSC pass rate of the school is lower than the Board's pass rate; Number of GPA 4 to 5 receivers from the school is lower than the national average per school; SSC pass rate of the school is lower than the	JSC pass rate of the school is equal to or higher than the Board's pass rate; Number of GPA 4 to 5 receivers from the school is equal or higher than the national average	JSC pass rate of the school is always higher than the Board's pass rate; Number of GPA 4 to 5 receivers from the school is always higher than the national average per school; SSC pass rate of the school is

Ma-jor Area	Indi-cators	Be-low Stan-dards (1 point)	Meets Stan-dards (2 points)	Ex-ceeds stan-dards (3 points)
	school is equal to or higher than the Board's pass rate; and	Board's pass rate; and	per school;	always higher than the Board's pass rate; and
	Number of GPA 4 to 5 re-ceivers of the school is equal to or higher than national average per school.	Number of GPA 4 to 5 re-ceivers of the school is lower than national average per school.	SSC pass rate of the school is equal to or higher than the Board's pass rate; and Num-ber of GPA 4 to 5 receiv-ers of the school is equal to or higher than national average per school.	Number of GPA 4 to 5 re-ceivers of the school is higher than national average per school.

6.3. Result/Statistical report of Rubrics Analysis

Below a table with "rubrics" with the current standards as "meets standard" and rubrics for "below standard" and "ex-ceeds standard" added for each indicator. The indicators will be used to tabulate an overall grading in percentage for sec-ondary schools in order to prioritize the institutions that need the most help. The last three columns of the below table would show the percentage of total number of institutions based on respective indicators.

The data management system of EMIS Cell is web-based, real time and multidirectional. SSQS data-sets are being inserted

and validated. More or less 62% data has been collected on 8th November 2016.

Table 4

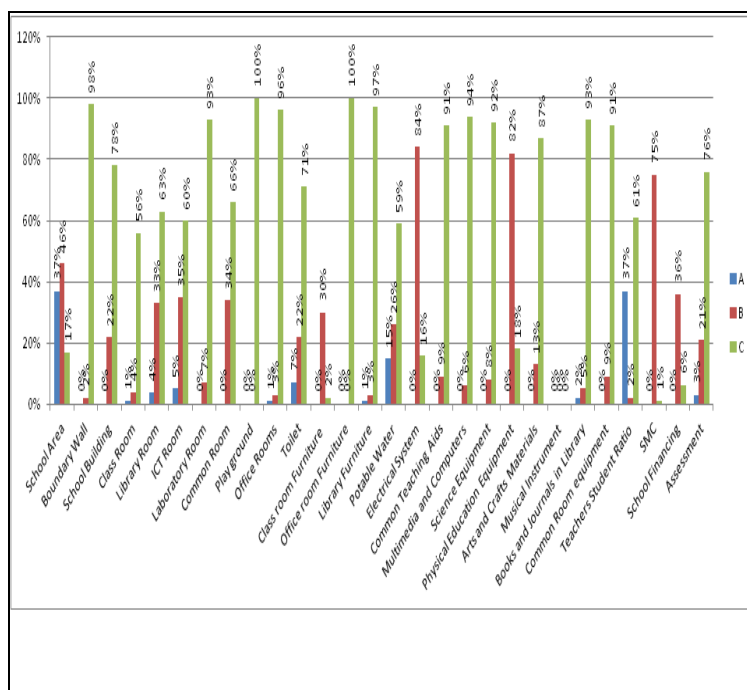| Major Area	Indicators	% of total no. of institutions under "below standards"	% of total no. of institutions under "meets standards"	% of total no. of institutions under "exceeds standards"	Number of Institutions provided da-ta
Teaching Facilities					
School Area	One acore (4,840 sq. yards)	17	46	37	8499
Boun-dary Wall	Pacca wall with a gate	98	2	0	18597
School Build-ing	Pacca Building Well maintained	78	22	0	18596
Class Room	Each classroom of 500 sq.ft.; Pacca partition wall; and Separate room for each class/section	56	4	1	12871
Library Room	Pacca library room of 500 sq.ft.	63	33	4	7138
ICT Room	Separate ICT room of 500 sq.ft.	60	35	5	8844
Labora-tory Room	Separate laborato-ry rooms, one each for Physics, Chemistry, Biolo-gy and Maths, each of 500 sq.ft.	93	7	0	7851
Com-mon Room	For uni sex school one room of 500 sq.ft.and For co-education school two rooms each of 500 sq.ft.	66	34	0	9747
Play-	Length: 100 yards	10	0	0	706

Major Area	Indicators	% of total no. of institutions under "below standards"	% of total no. of institutions under "meets standards"	% of total no. of institutions under "exceeds standards"	Number of Institutions provided data
ground	(90m) X Width: 50 yards (45m) Plane surface: Useable with grass Garden @20%of school area.	0			9
Office Rooms	Head Master's Room 500 sq.ft; Office Room 500 sq.ft. Teachers' Room 750 sq.ft. Staff Room 250 sq.ft. Store room 500 sq.ft.	96	3	1	120 59
Toilet	One Toilet for each 50 students; Separate Toilet for boys and girls;	71	22	7	187 22
Class-room Furni-ture per class/section	10 sets benches (each set of one high and one low), each set for 4 learners One chair and one table; and One usable writing board.	2	30	0	128 71
Office room Furni-ture	One table and 7 chairs for H/M room;	10 0	0	0	123 13

Major Area	Indicators	% of total no. of institutions under "below standards"	% of total no. of institutions under "meets standards"	% of total no. of institutions under "exceeds standards"	Number of Institutions provided data
	Two tables and 4 chairs for office room; and One desk with a chair and a cabinet for each teacher; and 5 Almirahs and 5 Cabinets				
Library Furni-ture	Table and bench for 50 students; One table and one chair for librarian; and Shelfs for 3000 books.	97	2	1	713 8
Potable Water	One tap for each 50 students; or One pump tube-well for each 75 students.	59	26	15	131 36
Elec-trical Sys-tem	Electricity is available in school All rooms have electric lights and one socket All rooms have electric fans	16	84	0	181 57
Equipment					
Com-mon Teach-ing Aids	Maps, Charts, Models, Geo-metry Box.	91	9	0	913 8
Multi-	10 Comput-	94	6	0	123

Major Area	Indicators	% of total no. of institutions under "below standards"	% of total no. of institutions under "meets standards"	% of total no. of institutions under "exceeds standards"	Number of Institutions provided data
media and Computers	ers/Laptops; Printer – 1; Modems/Wi-Fi; and Multimedia Projector – 2				04
Science Equipment	All equipment for General Science; *Applicable for School having Science Group*: All equipment as per curriculum for teaching Physics, Chemistry, Biology and Advance Mathematics.	92	8	0	6548
Physical Education Equipment	Football, Volleyball and Cricket set available	18	82	0	8864
Arts and Crafts Materials	Art papers, Painting brass; Colour all available	87	13	0	9864
Musical Instrument	Harmonium, Tablas and Pipe all available	0	0	0	0
Books and Journals in Library	2000 books covering supplementary reading materials, reference books, novel, fiction, biography,	93	5	2	14491

Major Area	Indicators	% of total no. of institutions under "below standards"	% of total no. of institutions under "meets standards"	% of total no. of institutions under "exceeds standards"	Number of Institutions provided data
	travel stories available				
Common Room Equipment	Table Tennis, Carom Board, Chess available	91	9	0	9308
Teacher-Student Ratio	Teacher: Student 1:30	61	2	37	
	Student per class 40	77	9	14	18701
SMC Composition and Procedures	School has regular SMC; SMC meetings are held regularly; SMC members carry out their functions; and SMC elections are held as per rule regularly.	1	75	0	17545
School Financing	School collects fees from the students regularly; School gets recurrent income from its assets; School pays part of the salary to MPO teachers and staff regularly; School pays full salary to Non-MPO teachers and staff regularly;	6	36	0	17336

Major Area	Indicators	% of total no. of institutions under "below standards"	% of total no. of institutions under "meets standards"	% of total no. of institutions under "exceeds standards"	Number of Institutions provided data
	Teachers and staff get MPO salary as per rule; and				
	Teachers and staff get MPO salary on time.				
Assessment	JSC pass rate of the school is equal to or higher than the Board's pass rate; Number of GPA 4 to 5 receivers from the school is equal or higher than that the national average per school; SSC pass rate of the school is equal to or higher than the Board's pass rate; and Number of GPA 4 to 5 receivers of the school is equal to or higher than national average per school.	76	21	3	133 09

Figure 5: Graphical Presentation of Statistical Result

6.4 Graphical presentation of indicators-wise grading of institutions in percentage:

The below bar diagram presents the position of institutions in percentage under below standards, meets standard and exceeds standards. In the graphic view, A represents the exceeds standard, B represents the meets standards and C represents the below standard.

7 FINDINGS

i. Some institutions don't have land that's why buildings of those schools are located in different places.

ii. The other strong materials are not properly defined, So a few institute are not matched with this indicator.

iii. A lot of institutions are not comply with "around whole school compound" and "other strong materials with lockable gate".

iv. Well maintained and Excellent condition for building are not properly defined. Therefore, data is not in line with indicators.

v. Actually, "Subject Based Room" is still new concept for Bangladesh. No school has subject base room.

vi. Librarians are available but no library physically exists.

vii. The name of this indicator (ICT room) is confusing because there is lot of different names like multimedia class room, computer lab, ICT lab etc. Therefore, data quality is not good.

viii. Subject based lab is more appropriate than subject base room.

ix. There is no six subjects based laboratory rooms in schools. Therefore, no exceeds standard school in Secondary Level.

x. The conditions of this indicator are very complex. That's why out of 7069 institutions, there is no institutions under meets standard and exceeds standards. Plane surface useable with grass and 20% garden of school area is not match with institutions.

xi. The conditions of this indicator are too complex. Out of 12059 institutions 96% are graded below standards.

The conditions of meets standard and exceeds standards are not matching with maximum number of institutions.

xii. This indicator should be divided into separate indicators as HT Rooms, office rooms, staff rooms and Store rooms.

xiii. "Self for storage" is the new item in the class room to field level stakeholders. It is also not defined. For that reason, the percentage of institutions under exceeds standard are nil. 68% institutions are non-compliant under this indicator.

xiv. To assess the institutions by this indicator is very critical due to multiple conditions. To meet the standards, institutions are needed to fulfill four conditions. Out of 12313 institutions, all of them under below standards that is very unusual.

xv. This indicator should divided into separate more indicators HT rooms furniture and teachers' room furniture.

xvi. To assess the institutions by this indicator is very critical due to multiple conditions. To meet the standards, institutions are needed to fulfill four conditions. Therefore, out of 7138 institutions 97% are graded as below standards.

xvii. Data quality is not good because there is a librarian in some schools but no library in those schools physically.

xviii. Pump tube well is not well known to field officials.

xix. The conditions for meets standard and exceeds standards are not easy to meet for institutions. Due to the conditions "Electricity is always available in the school" institutions are not meeting the conditions for exceeds standards.

xx. Institutions generally don't keep the records of "Frequently power cut" and "always electricity", that's why the data quality of this indicator is not good.

xxi. The conditions for exceeds standard are too critical to achieve this standard. The 4th condition of exceeds standards are not known to field level stakeholders.

xxii. The name of general science equipments are not specified in the SSQS documents. The curriculum based science equipments are not known to field level stakeholders. Among 6548, there is no institutions under exceeds standards, only 8% institutions under meets standard but 92% institutions under below standards.

xxiii. To assess the institutions by this indicator is very critical due to multiple conditions. Functionality of SMC members is not measurable. Field level stakeholders are not aware of PTA. 24% institutions are non-compliant under this indicator.

xxiv. To assess the institutions by this indicator is very critical due to multiple conditions. At least, six conditions have to meet one standard under this indicator. Therefore, institutions might go under non-compliant group. 58% institutions are non-compliant under this indicator.

xxv. To assess the institutions by this indicator is very critical due to multiple conditions. At least, four conditions have to meet one standard under this indicator. Therefore, institutions might go under non-compliant group.

8 CONCLUSION

There are about 29 indicators are measured by Rubrics Methodology (Table 4) to categorized the secondary institutions into three standards i.e. below standard, meets standards and exceeds standards. The result shows that each indicator belongs secondary schools of below standards (Table 4 and Figure 5) which need prioritized help to achieve Sustainable Development Goals (SDG 4) and ensure the quality of secondary education. The authority of secondary education could find now that the kind of help need for what schools and actions are to be taken accordingly. The weaknesses of the system are described in the section 7 that are indeed need to resolved before next time data collection and report preparation.

9 RECOMMENDATION

a) A series of training/workshops should be organized on SSQS for all field level stakeholders as well as follow up training.

b) the conditions of different standards should be reviewed and modified;

c) Build up a strong link up in between SSQS tools and educational stakeholders.

d) Strengthened the capacity of EMIS cell;

e) Strengthened the capacity of field level stakeholders in the areas of data analysis and the basic role of education statistics in planning and policy making.

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