FINAL DRAFT

Papua New Guinea Education Data Quality Assessment Report

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Acronyms

ASIHE	Annual Survey of Institutions of Higher Education
DCD	Department of Community Development
DFAT	Department of Foreign Affairs and Trade (Australia)
DHERST	Department of Higher Education, Research, Science and Technology
DHS	Demographic and Health Survey
DNPM	Department of National Planning and Monitoring
DQAF	Data Quality Assessment Framework
ECCE	Early Childhood Care and Education
ECD	Early Childhood Development
EMIS	Education Management Information System
FODE	Flexible Open and Distance Education
GER	Gross Enrolment Ratio
HEI	Higher Education Institution
ICT	Information and Communications Technology
ISCED	International Standard Classification of Education
LLG	Local Level Government
MSA	My School Application
NDOE	National Department of Education
NEB	National Education Board
NEP	National Education Plan
NER	Net Enrolment Rate
NGO	Non-Governmental Organisation
NSC	National School Census
NSDES	National Strategy for the Development of Education Statistics
NSDS	National Strategy for the Development of Statistics
NSO	National Statistics Office
NTC	National Training Council
NTT	National Technical Team
OLA	Office of Libraries and Archives
PEB	Provincial Education Board
PIFS	Pacific Islands Forum Secretariat
PNG Info	Papua New Guinea Information System
PNGQF	Papua New Guinea Qualifications Framework
SDG	Sustainable Development Goals
SDS	Strategy for the Development of Statistics
SPC	Pacific Community
TFF	Tuition Fee Free Policy
TSC	Teachings Service Commission
TVET	Technical and Vocational Education and Training
UNESCO-UIS	UNESCO Institute of Statistics

Executive Summary

The UNESCO Institute for Statistics (UIS) in collaboration with the Pacific Community (SPC) and with the support of the Australian Department of Foreign Affairs and Trade (DFAT) and UNESCO office in Apia conducted a data quality assessment of the education statistical system in Papua New Guinea in October 2017. The Education Data Quality Assessment is an in-depth and education sector wide assessment of the national data production chain and will help develop a sectoral strategy for the development of statistics.

The purpose of the Data Quality Assessment is to investigate the data production chain and provide a diagnostic of the state of the collection, production, use and dissemination of the education data; and assess national capacity needs and develop recommendations for support and resources required for the improvement of the monitoring of the Education sector.

In a close collaboration with the national technical team, the quality of the data production chain was assessed through a consultative process with key stakeholders in the education sector. The team involved will review documentations on the production and use of education statistics, including: policies and regulations, technical documents, statistical publications, and data user feedback

The report provides an overview of the education system in Papua New Guinea, including the organisational structure and regulation of the education sector. Following the overview, the data collection and production processes in the education sector are briefly explained, and the national education statistical system described. The data quality assessment process is discussed which covers the membership and training of the national technical team, a summary of the evidence gathering process, and an overview of the consultation workshop.

The findings of the data quality assessment are presented for each of the eight principles of data quality: policy and legal framework, adequacy of resources, relevance, sound methodology, accuracy and reliability, periodicity and timeliness, consistency, and accessibility and clarity. The findings were informed by the scores, comments, and evidence provided in the indicator matrix completed by the mission and the national team. Following the findings, recommendations for improvement are suggested based on statistical priorities for the national education sector.

The recommendations are structured in three parts that cover the institutional and policy environment, the organisational/statistical processes, and the dissemination and use of education statistical outputs. The recommendations were discussed during the consultation meeting, and require further consideration and prioritisation by the national education sector agencies. Following the recommendations, a conclusion outlines the way forward, including the design and implementation of a National Strategy for the Development of Education Statistics (NSDES) based on the education component of the National Strategy for the Development of Statistics (NSDS).

1. Introduction

The UNESCO Institute for Statistics (UIS) in collaboration with the Pacific Community (SPC) and with the support of the Australian Department of Foreign Affairs and Trade (DFAT) and UNESCO office in Apia, are currently reinforcing their support to education statistical capacity in the Pacific. Recognizing the importance of diagnosing the needs and identifying issues encountered by Pacific Member States, the UIS are starting a series of national assessments to discuss the various matters at stake and establish a roadmap for statistical and technical capacity support to countries for the upcoming years. These exercises have as starting point the Education Data Quality Assessments Framework (Ed-DQAF).

The Ed-DQAF has been successfully implemented by the UIS in five countries in the Pacific region where it will be used as the basis for national initiatives aiming at improving the monitoring of education. Going further than a simple assessment of the quality of data itself, the DQAF draws a full picture of the environment and conditions through which data are collected, produced, and disseminated. The assessment covers the different steps included in the statistical business process model at the national and sub-national levels, and assesses the strengths and weaknesses of the available structures. In addition, the assessment provides a comprehensive evaluation of the quality of education data with regards to the best practices at the international level.

In 2017 the UIS proposed in collaboration with SPC to undertake an Ed-DQAF assessment in Papua New Guinea. The National Department of Education (NDOE) agreed to participate in a data quality assessment of the national education statistics for Papua New Guinea. A joint UIS-SPC mission together with a national team undertook a review of the quality of the national education statistical system from 23 to 27 October 2017. The purpose of the Ed-DQAF exercise in Papua New Guinea was to:

- Provide a diagnosis on the state of the collection, production and dissemination of education data;
- Develop a roadmap for support and resources needed to improve the monitoring of education, including the development of EMIS systems;
- Supporting national government agencies to become ready for reporting to the regional and international agenda such as the Regional Education Framework (REF) and the Sustainable Development Goals (SDGs).

This data quality assessment of the education statistical system in Papua New Guinea follows the 2015 SABER country report on Education Management Information Systems (EMIS) in Papua New Guinea (PNG). The objectives of that report were to examine the system according to key policy areas, identify successes and challenges in the system, and provide recommendations to support the continued advancement of the EMIS. Where relevant, references to the SABER report's findings are made in support of the Ed-DQAF findings.

The Government of Papua New Guinea has recognised the importance of gathering and using

evidence for policy decision-making. The National Education Plan (2015-2019) has prioritised strategies that will lead to an improved education service delivery through effective planning and management, including improving communication and access to information across all levels of education. Strengthened data systems are vital for the development and use of results-based monitoring and evaluation to ensure accountability at all levels of government. This report situates the Ed-DQAF assessment as part of the long-term process for improving the EMIS system in Papua New Guinea.

In this report the main sources of education data, including the Education Management Information System (EMIS), national household surveys (such as DHS and HIES), learning assessments (such as PILNA), and education finance are discussed. However, the report focuses on the quality of the EMIS systems of the National Department of Education (NDOE) and the Department of Higher Education, Research, Science and Technology (DHERST) as the main source of education data for the national education system in Papua New Guinea.

While the Ed-DQAF assessment reviews the current state of management information in the education sector, it should be noted that a lot of progress has been made in the past few years, especially with the EMIS systems of the National Department of Education (NDOE) as well as the Department of Higher Education, Research, Science and Technology (DHERST). Indeed substantial progress has been achieved in the development of the national EMIS systems in spite of the on-going resource constraints faced by the Government of Papua New Guinea. It is expected that the assessment will lead to the identification of further practical improvements that can guide future investments in the development of education statistics in Papua New Guinea.

2. Overview of the National Education System

2.1 Education System Structure

The National Education System (NES) currently follows a 3-6-2-2 structure - 3 years of elementary, 6 years of primary, two years of lower secondary and two years of upper secondary. All children are expected to enrol in their first grade of schooling (preparatory) at age six and stay in the mainstream system for thirteen years until they complete grade 12 at age eighteen. National examinations are done at the end of grades 8, 10, and 12, where students with the required pass marks transition to grades 9, 11 and to tertiary education (universities, technical colleges etc.), respectively. Figure 2.1 below provides more information of the official age of each grade, as well as how each grade corresponds to PNG education and ISCED levels.

Figure 2.1

Official Age (years)	Grade	PNG Education Sector/Levels	ISCED Mapping
6	Preparatory	Elementary	Pre-Primary
7	Elementary 1/ Grade 1	Elementary	Primary
8	Elementary 2/ Grade 2	Elementary	Primary
9	Grade 3	Primary	Primary
10	Grade 4	Primary	Primary
11	Grade 5	Primary	Primary
12	Grade 6	Primary	Primary
13	Grade 7	Primary	Lower Secondary
14	Grade 8	Primary	Lower Secondary
15	Grade 9	Lower Secondary	Lower Secondary
16	Grade 10	Lower Secondary	Lower Secondary
17	Grade 11	Upper Secondary	Upper Secondary
18	Grade 12	Upper Secondary	Upper Secondary

The current education structure emanated from the 1991 review of the National Education System (NES). It was recommended as a strategy to increase the capacity of the system to take in more children, and to provide them with pathways to pursue and realize their education goals. To that end, the structure provides alternative pathways for students to attain higher qualifications (see figure 2.2 below). Students in grades 8 and 10 who do not attain the required pass marks to transition to the next grade/level can enrol in Flexible Open Distance Education (FODE). The same students can also transition to vocational education. While vocational grades do not have official age requirements, students' age in vocational schools largely align with those of secondary education grades. Upon successfully completing the final grade in their programs, vocational education students can transition to technical colleges or join the employment market.

Figure 2.2
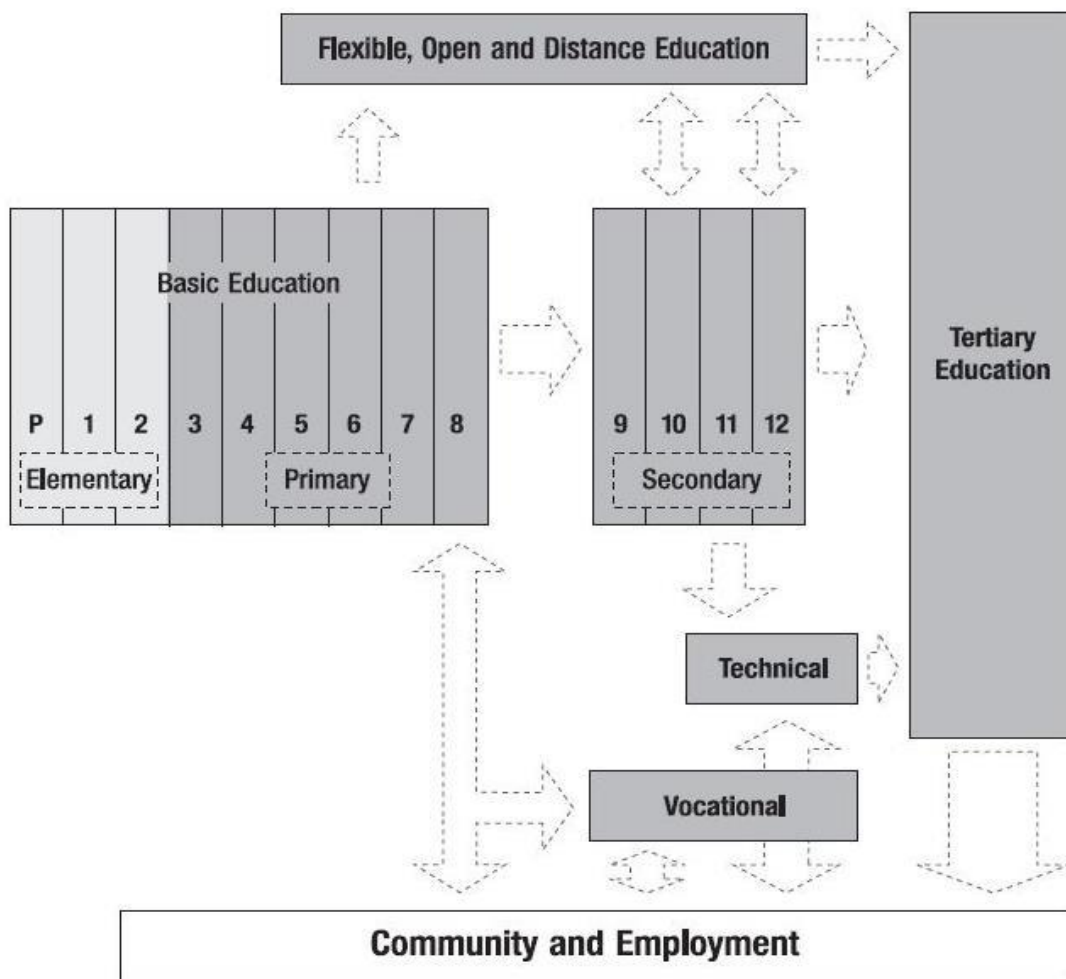
In total, there are almost 2.2 million students in elementary, primary, secondary, TVET, FODE and tertiary education. Below is a table that gives a breakdown of students enrolled in national educational institutions by education level and gender.

Table 2.1: Number of students enrolled in national educational institutions[1]

Education levels	Male Students	Female Students	Total Students
Elementary	480,138	432,102	912,240
Primary	541,718	443,650	985,368
Secondary	118,329	75,314	193,643
Vocational	30,171	13,364	43,535
FODE	12,976	10,644	23,620
Technical	3,785	1,362	5,147
Tertiary	19864	13075	33,991*

* includes students with unknown gender

[1] According to National School Census (2016) and Annual Survey of Institutions of Higher Education (2015)

The education system in PNG is highly decentralized; there are three governance levels: national, provincial, and local (districts and schools). At the national level, the DoE is responsible for setting and implementing national policies, such as curriculum development, teacher training and education; establishing, preserving, and improving standards of education; and ensuring broad access to quality education. Provincial and local-level authorities are responsible for planning, financing, staffing, and maintaining general education institutions up to grade 12. In 2012, as part of the Universal Basic Education Plan, the Tuition Fee Free (TFF) policy was introduced, abolishing school fees and leading to a surge in enrolment. High enrolment numbers has put considerable stress on the system, evidenced by high average class size and pupil-teacher ratios, as well as textbook shortages and gaps in teacher qualifications.

2.2 National Education Plan (NEP)

The National Education Plan (NEP) 2015–19, titled 'Quality Learning for All', is designed to give all children in Papua New Guinea, regardless of their ability, gender, or socio-economic background, an opportunity to be educated and to transform their lives, using a holistic, inclusive and integrated approach. The NEP only covers the following education levels: Elementary, Primary, Secondary and alternative pathways such as vocational education and FODE.

The NEP outlines the six strategic focus areas: access and equity, teachers and teaching, learning, alternate pathways, local management and system strengthening. For each focus area there are clear strategies that will be detailed into activities and operational plans to be written by the National Department of Education and all other education partners and stakeholders around the country. The strategies have associated deliverables which will result in clear outputs by 2019, such as more infrastructure and teachers in place and easier access to alternate pathways for the development of work and life skills. All are underpinned by a focus on improving Quality of Education. The outputs are designed to produce three outcomes related to access to education, achievement of learning and effective and efficient operation of the education system. Combined achievement of those outcomes will result in attainment of the ultimate goal; quality learning for all.

The overall goal and outcomes of the NEP were designed to be consistent with: the Papua New Guinea National Goals (PNG Vision 2050, Development Strategic Plan 2010-2030, Medium Term Development Strategy 2011-2015); international obligations, in particular the Millennium Development Goals and Education For All (EFA) goals; community demands as determined during provincial consultations.

3. National Education Statistical System

The main producers of education statistics for Papua New Guinea are the National Department of Education (NDOE), the Department of Higher Education, Science and Technology (DHERST), the National Training Council (NTC) and the National Statistical Office (NSO).

NDOE collects data in an annual National School Census on schools within the national education system (including government, community and church schools) as well as private schools. Data is collected from elementary schools (for preparatory and grades 1-2), community and primary schools (for grades 3-8), provincial, secondary and national high school (grades 7-12), and vocational schools (vocational centres and technical high school). NDOE does not collect information on early childhood care and education (ECCE) which is the responsibility of the Department of Community Development. Currently no data is collected and published on the ECCE sub-sector. The NDOE publishes an annual education statistics bulletin, which provides data on student enrolments and teacher staffing of schools in the national education system and in private schools at elementary, primary, secondary and vocational level. The information is used by the NDOE to track progress of the National Education Plan (NEP) and to measure its performance against the major outcomes[2]. The Provincial Education Boards (PEB) collect information on the enrolments and absences of students on a monthly and quarterly basis, though the receipt of the data is often delayed. Inspectors then send this information to the NDOE, though it is not recorded in the EMIS. The Provincial Educational Advisors (PEAs) use the data to plan for teacher recruitment and establishment for the following year. The Teacher Services Commission (TSC) tracks teacher absenteeism monthly and quarterly, but is not integrated into the EMIS system.

The NDOE also collects data on learning outcomes from national education assessments. The Measurement Unit collects data from schools on the number of students who are sitting for Grade 8, 10 and 12 exams. Student ID numbers are then allocated for students candidates who will sit for exams. At the beginning of the school year, Provincial Education Supervisors and school principals are trained on the data requirements. Before April each year the updated data are sent to NDOE for examination printouts and allocation of student information booklets for Grade 8, 10 and 12. Reports on the results of the examinations are made to NDOE at national level and PEBs at provincial level, though the data is not published.

Papua New Guinea was among the thirteen Pacific countries that participated in the Pacific Islands Literacy and Numeracy Assessment (PILNA) tests in literacy and numeracy in 2015 for which more than 45,000 students in Year 4 and Year 6 in some 700 schools took part in what is now the largest ever assessment in the Pacific region. The tests are based on completion of six years of equivalent schooling, which would be children who are in Grade 5. These numbers are of Grade 5 students who sat for PILNA 2015; 10,500 students participated in numeracy tests and 12,380 students in the literacy tests. The Papua New Guinea PILNA 2015 country report was presented to the DoE early in 2017. Papua New Guinea further took part in the PILNA trial in 2017, and will participate in the next PILNA in 2018.

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[2] A list of the tables produced in the statistical report are provided in the annex

NDOE uses a number of systems for financial management and payroll; however, they are not integrated with EMIS. These systems include the Integrated Financial Management System, the payroll management system, and the Provincial Government Accounting System.

DHERST collects data in the Annual Survey of Institutions of Higher Education (ASIHE) for recognised institutions of higher education, including universities, teachers and nursing colleges, technical and business colleges, as well as other training institutes. The DHERST publishes an annual publication on the results of the survey and uses the information to track the sub-sector's progress against the Government's development targets. The survey provides information for policy formulation, development programme planning and project management and most importantly is evidence-based decision making. The report contains an analysis of key higher education indicators such as graduates, enrolments, and staffing. This data is further broken down to give an indication of gender equity in each of these three areas. Details of the tables produced in the survey report are provided in the annex.

NTC collects data on apprenticeships registered at private companies and trainees enrolled with TVET providers on a three yearly basis as part of its quality assurance audit. This data includes information on trainee enrolments and staffing in TVET programmes. The information is used to identify national training needs so that local based private and public sector training providers can better plan to meet those needs, as well as to inform government policy on TVET, including registration of TVET providers. The data currently is not published in a publically accessible statistical report, except in its annual report to Government.

NSO is responsible for the collection and production of population statistics, as provided under the Statistics Act by conducting population censuses and household surveys. The Papua New Guinea Population and Housing Census 2011 report provides some analysis of school attendance, education attainment, and literacy. A population census in 2020 is currently being planned which will also include questions on school attendance and education attainment. In 2016, the NSO conducted a Demographic and Health Survey (DHS) which also collects information on school attendance, years of schooling, and education attainment as well as reasons for not attending school; the report has yet to be published. The NSO does not currently publish any data on its website for administrative education statistics.

Papua New Guinea has contributed to the international reporting of education statistics. In 2015 a study of out of school children was initiated by UNICEF in association with UIS to assess the effect of tuition free education on school enrolment; the report is yet to be published. NDOE has submitted data for international reporting, such as the UIS questionnaire on students and teachers from ISCED 0-4 for 2014, though the 2015 and 2016 data submissions have been delayed. Data for the ED/B questionnaire on education finance and ED/C questionnaire on tertiary education is not reported for Papua New Guinea. Population statistics on education attainment and literacy rates have not been reported to UIS for the last population census in 2011.

The Department of Community Development (DCD) is the regulator of ECCE providers which are not funded by government. Early childhood teachers are volunteers and not paid. UNICEF has assisted the DCD to develop an ECCE curriculum and a contract has been given to NDOE to work

on curriculum and standards. Data on ECCE centres are collected throughout the country and internal reports are produced. However, data is confidential and not shared but only available upon request. Adult literacy information from community learning centres is also collected by the Department of Community Development, though no reports are publicly available.

Table 3.1: Education data collection agencies and mechanisms in Papua New Guinea

ISCED Level	National Education System level	Agency mandated for producing statistics	Agency responsible for data collection	Data collection mechanism
ISCED 0 Pre-Primary Education	ECCE programmes (private) Elementary School (Preparatory year)	Dept. of Community Development / National Department of Education	Early Childhood Education Office Provincial Education Authorities	*No data collection* / National School Census
ISCED 1 Primary Education	Elementary School (Grade 1 to 2) Primary School (Grade 3 to 6)	National Department of Education	Provincial Education Boards	National School Census
ISCED 2 Lower Secondary Education	Primary School (Grade 7 to 8) Secondary School (Grade 9 to 10)	National Department of Education	Provincial Education Boards	National School Census
ISCED 3 Upper Secondary Education	Secondary School (Grade 11 to 12)	National Department of Education	Provincial Education Boards	National School Census
ISCED 3-4 Technical & Vocational Education	Trade Certificates National Certificates (PNGQF level 1-2) National Certificates (PNGQF level 3-4) Diplomas/Adv Dip Apprenticeships Trades Training	National Department of Education / Dept. of Higher Education, Research, Science & Technology Ministry of Labour and Industrial Relations	Provincial Education Boards / Office of Higher Education National Training Council & National Apprenticeship and Trade Testing Board	National School Census Annual Survey of Institutions of Higher Education Private Training Provider Plans & Assessment
ISCED 5-8 Tertiary Education	University Degrees and Diplomas (incl. Post-Graduate Dip.)	Department of Higher Education, Research, Science & Technology	Office of Higher Education	Annual Survey of Institutions of Higher Education

3.1   Education Management Information System

The Department of Education established an Education Management Information System (EMIS) in 2004 as the point of reference system that collects, processes and disseminates education data on an annual basis. The department used a combination of Microsoft Excel and Access programs for data storage in 2004 before migrating to a web-based Oracle database in 2006.

Data are sourced annually through a paper-based National School Census (NSC), which moves from schools to district offices and on to provincial offices, before going to the Department of Education to be input into the system. EMIS captures data on school details, student enrolment and their

demographics, teachers' data, school infrastructure and some financial data. Analysis is conducted using Oracle Discoverer and Ms Excel.

The National Plan for Education 2005–2014 set a roadmap for timely collection, management, and utilization of data in decision making. The plan set the foundation for EMIS; however, it did not institute comprehensive EMIS policies or an EMIS budget. Policies do not outline procedures to ensure student data confidentiality, nor do they define processes and procedures for sharing data with other government units. Policies do not require that information be reported back to local levels, especially schools. In response to the 2014 SABER EMIS assessment, NDOE has now developed a draft EMIS policy, however the policy has not yet been published.

The main source of data used for producing education statistics is the Papua New Guinea Education Management Information System (PNG EMIS). The NDOE EMIS and Statistics unit has the mandate of collecting data from schools and has recently developed new data collection instruments that capture electronically the required data from schools.

The NDOE collects large amount of data annually and stores in the oracle database in which EMIS data is kept. Data are collected annually using a paper based approach. This database is not connected to other DOE databases and operates as a stand-alone system that collects school data. There are significant challenges which includes data inflation and entering of data manually that contributes negatively to data quality and reliability. This database is driven by specific commercial interest and requires high licensing and maintenance fees.

There are a number of education related datasets that are topic-specific currently operational in the NDOE. This includes school details, school finances, student enrolments, school infrastructure and resources, school management, teacher information, and school graduates. These datasets are integrated into a custom developed Oracle database for storing the annual school survey data. The EMIS system is maintained by the NDOE ICT unit. The table below summarises the EMIS datasets[3].

Table 3.2: The dataset structure of the NDOE EMIS system

EMIS Dataset	Dataset Contents	Data Source
School details	School name & code Location information & codes Operating status & registration Education authority School type, sector and level Contact details	National School Census Note: The school registration database is now merged into EMIS
School finances	Source of school funds Amount of funds received TTF funding bracket TTF fund allocation	National School Census Note: The Tuition Fee Free (TFF) application calculation runs in the EMIS database, using data collected through the national school census. Note: Data on school capital or recurrent expenditures are not collected.

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[3] The datasets listed only include those contained within the EMIS system, and excludes other datasets, such as, learning assessment, national school standards, and teacher registrations.

Student enrolment	No. classes by grade No. students by gender & grade No. students by gender, grade & age No. repeaters by gender & grade No. vulnerable students by gender & grade No. students w disabilities by gender & grade No. boarding students by grade & gender No. Voc Ed. Students by gender & program	National School Census Note: Data are collected in aggregate form by school using data tables.
School infrastructure	No. of classrooms by type and condition No. libraries, offices, computer labs, etc. No. of staff houses by type and condition No. of student toilets by type and condition Source of drinking water Hand washing facilities (with soap & water) Type of electricity supply	National School Census Note: Data are collected in aggregate form by school using data tables and check boxes.
School management	School learning improvement plan School inspection in last 12 months Travel time to district/provincial office Board of management + meetings Parents & community + meetings	National School Census Note: Data are collected by school using Yes/No check boxes
Teacher information	No. teachers by gender & grade Teacher name Gender Date of birth Nationality Registration type Type of employee Year started teacher Highest teaching qualification Qualification year & institution Teaching grade/classes/subjects	National School Census Note: Data is collected for each teacher if the teacher has an ungraded qualification or is new or transferred from another school. Note: The Teacher Services Commission (TSC) has a separate DB with teacher information.
School graduates	No. of Year 8 graduates by gender No. of Year 10 graduates by gender No. of Year 12 graduates by gender No. of Voc. Ed. graduates by gender No. of Voc. Ed. graduates by certificate.	National School Census Note: Student registration for national examinations & results are kept by the Measurement Services Division and is intended to be merged into EMIS

The Department of Higher Education, Research, Science and Technology (DHERST) conducts an Annual Survey of Institutions of Higher Education (ASIHE) which collects and reports information on annual enrolments and graduates in tertiary and TVET education. Individual student and teacher data is collected from universities, business colleges, teachers colleges, technical and vocational institutions. DHERST collects data from the institutions using an Excel template which is emailed to institutions for completion by the end of March in the following academic year. The template specifies the data fields to be reported. The following table shows the data item that are collected on student enrolments, graduates and academic staff[4].

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[4] Currently other data sets like financial, educational resources and equipment, institutional facilities and infrastructure are not included in the data collection.

Table 3.3: The dataset structure of the ASIHE database system[5]

ASIHE Dataset	Dataset Contents	Data Source
Institutions	Name Campus Province Institution Type Programs/Courses Qualification Level Field of Study	Recognised IHE Registration
Enrolments	Name Gender Date of birth Marital status Country of citizenship Home province/district Province of residency Course/Program School/Facility/Department Mode of study (full/part-time, external) Enrolment status (new entrant, continuing, postgrad) Year of study Sponsorship type Graduation date Withdrawal reason	Annual Survey of Institutions of Higher Education (ASIHE)
Graduates	Name Gender Date of birth Marital status Country of citizenship Home province/district Province of residency Course/Program School/Facility/Department Mode of study (full/part-time, external) Sponsorship type Graduation date	Annual Survey of Institutions of Higher Education (ASIHE)
Staffing	Name Gender Date of birth Marital status Country of citizenship Home province/district Staff type School/Facility/Department Position Teaching/non-Teaching Weekly contract hours	Annual Survey of Institutions of Higher Education (ASIHE)

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[5] Note that this structure relates to data collect from 2015; historical data is available in aggregate from 2012.

	Highest qualification attained Qualification institution and year Vacant/study leave	
School leavers	Gender Citizenship Date of birth Religion Home province/district Parents occupation Parents estimated income IHE Program of study choice Grade 11/12 end of year results Differential Aptitude Test results	Grade 12 School Leaver Form Note: Data is collected for individual school leavers selected by higher education institutions

3.2 Data collection process

This section outlines the data collection processes for the National School Census conducted by the National Department of Education (NDOE) for the Annual Survey of Institutions of Higher Education (ASIHE) conducted by the Department of Higher Education, Science and Technology (DHERST).

National School Census

The National Department of Education (NDoE) conducts a National School Census (NSC) once a year. The census collects data from both public and private schools in 4 education levels – elementary, primary, secondary and vocational education. Each education level has a paper-based form that captures school details (e.g., code, name, location, agency, registration), enrolment (by grade, gender, age and disability) and graduation data, financial data (e.g., sources of funding, bank account information), infrastructure data (e.g., classrooms, WASH facilities), teacher information (e.g., registration number, year started, qualification), and additional information such as existence of a Board of Management and information on instructional tools such as textbooks. Census forms are distributed to all schools through the education office in the provinces and district in March of every year.

Forms are sent to Provincial Education Offices who then distribute to schools. Five copies are sent to schools to fill out. Schools fill out the information manually because of remoteness and no access to photocopiers. Schools are informed that the data will be used to chart the progress of the National Education Plan and assist provinces for future education services. Teachers in charge of schools are asked to fill out the form accurately and honestly as possible, and to make four copies – for the school records, the District Education Officer, and the Provincial Education Adviser who sends a copy of the form to the EMIS and Statistics unit of NDOE as the official record for the school. The person who completes the form signs off the form as being accurate and completed.

All completed forms must go through two stage data reliability and validity check points electronically or manually. Officers designated to verify data must endorse the forms electronically or stamp it if data is collected through paper based method. All school data goes through four

validation stages at district, province, region, and head office level either electronically or manually. Data is monitored and verified by Inspectors, Provincial Census Coordinators, Provincial Education Advisers and Regional Census officers. A census form validation checklist has been developed to act as a guide to the Department of Education staff at the provincial and district offices when checking the completeness and correctness of data in the National School Census forms. The document provides a guide to verifying school census forms for each section of the National School Census form.

The EMIS database is web-based and all provinces have access to it, however data entry for a majority of provinces is done at the national level. Currently 5 provinces (Manus, Milne Bay, East New Britain, Morobe and Eastern Highlands) are entering data at their offices with varying success. The success was a result of efforts to roll-out ICT and EMIS services to the province and training of key provincial staff on capture and entry of school census data. The efforts started in 2012 with providing ICT equipment, connectivity, applications and IT services to provincial offices. The offices were connected to DoE headquarters and EMIS database was further enhanced to be web-based and was made available to provinces. The main objective for rolling out the data entry component of EMIS was to give provinces ownership over processing their data. Since they have the knowledge and mandate to resolve most data issues locally, it was envisaged that the provinces would be able to provide accurate data on a timely basis through capacity building conducted by both EMIS and ICT teams.

The Department collects large amount of data annually and stores in the Oracle database in which EMIS data is kept. This database is not connected to other DOE data bases and operates as a standalone system that collects school data. There are significant challenges which includes data inflation and entering of data manually that contributes negatively to data quality and reliability. This data base is driven by specific commercial interest and requires high licensing and maintenance fees. The long term solution is to engage a software designer to develop an open software tailored to DOE needs.

In 2017, the Department of Education developed and piloted an application specifically designed to collect and verify data and is able to provide data electronically to the Ministry of Education. The application is referred to as 'My School Application' (MSA). Schools will use smart phones, tablets or computers to send in their data as texts via the internet. The My School Application is an electronic census form. The data that is collected through the 'my school application' will be captured and uploaded through the EMIS which stores the whole of Department of Education data. Full implementation of this application will begin from 2018 onwards.

Figure 3.1: National School Census Data Flow Diagram
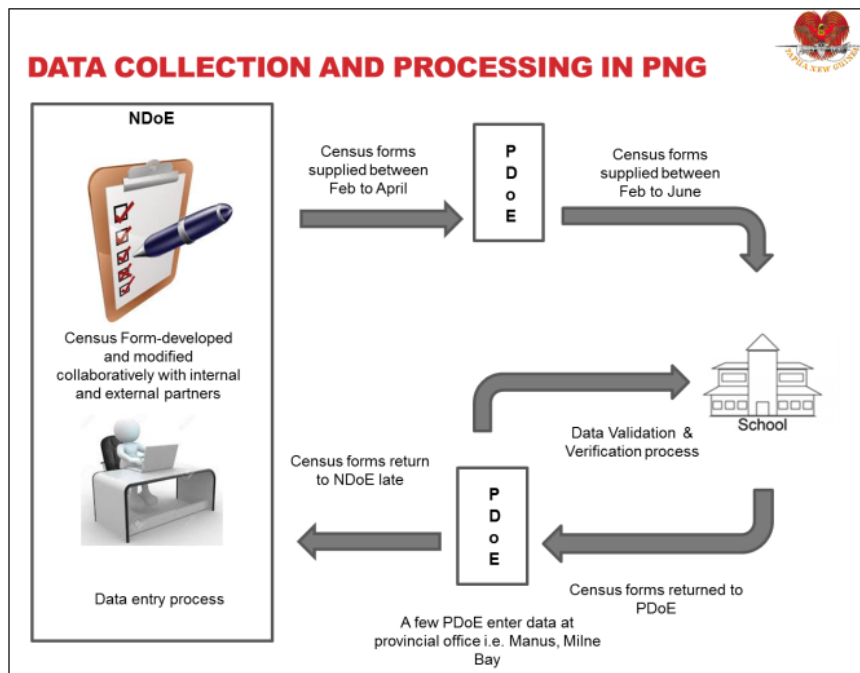
School census information is collected from the government run schools. Church run agency schools come under the government run system. Private approved schools also filled the forms. Private schools which are non-compliant with the school census are those that have their own curriculum and assessment system. As the NDOE strategy is to integrate both public and private schools into one system, additional capabilities are being built into EMIS to cater for permitted schools.

School registration and special education are now integrated into EMIS; before it was in a separate Access database. Integration of this data into EMIS solved the issue of duplication of information. However it takes a long time for schools to get registered by NDOE, which causes issues for the school census which requires the school to be registered before completing the census form.

All 22 provinces have access to EMIS, though only 5 provinces are able to input data directly into the system. These provinces have dedicated data entry officers which reduces the impact of delays caused by transportation and logistics of entering the forms into EMIS. The school census forms are shipped (i.e. flown) to provinces. Enrolment data is prioritized in data entry as it is directly related to the Tuition Fee Free Policy (TFF) where funds need to be disbursed to schools quickly for their school operations.

Annual Survey of Institutions of Higher Education

The process for the collection of data from institutions of higher education is different from the national school census conducted by DoE, in that data is collected at an individual unit-record level. DHERST sends out to institutions an Excel template for completion at the end of the academic year. The template lists the data fields which need to be filled in electronically. The institutions need to complete the template themselves. However while universities respond well, the technical and business colleges, which often are not familiar with Excel, require assistance to fill in the form.

DHERST officers also need to visit most institutions to help compile the data which may not be in an easily accessible form. The completed templates need to be returned by email to DHERST by the end of the first quarter for enrolments, graduates and teachers for the previous academic year. The data is then validated and cleansed before being included into the DHERST ASIHE database. The data is then analysed through saved table queries and tables are produced for the annual statistical report for institutions of higher education automatically. The data production cycle is shown below:

Figure 3.2: Data production cycle for Annual Survey of Institutions of Higher Education
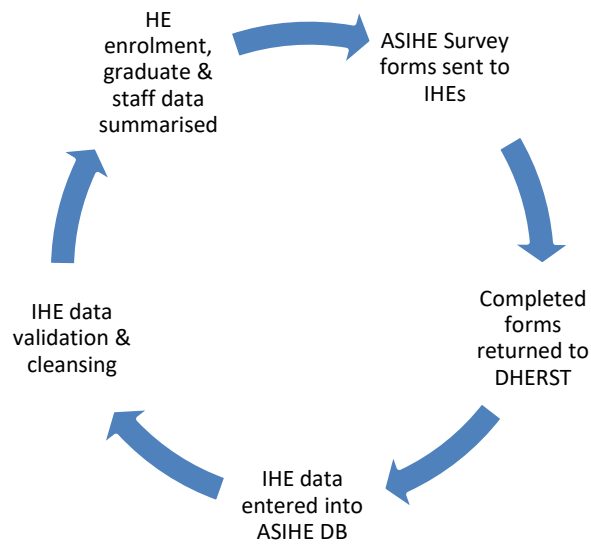
4. Data Quality Assessment Process

Education Data Quality Assessment is an in-depth and education sector wide assessment of the national data production chain and helps to develop a sectoral strategy for the development of statistics. The purpose of the Data Quality Assessment is to investigate the data production chain and provide a diagnostic of the state of the collection, production, use and dissemination of the education data; and to assess national capacity needs and develop recommendations for support and resources required for the improvement of the monitoring of the Education sector.

In a close collaboration with the national technical team, a joint UIS/SPC fact finding mission assessed the quality of the data production chain through a consultative process with key stakeholders in the education sector. The team reviewed documentation on the production and use of education statistics, including: policies and regulations, technical documents, statistical publications, and data user feedback. The team assesses the institutional environment, statistical processes and outputs according to the UIS principles of data quality in the Education Data Quality Assessment Framework (Ed-DQAF).

4.1 Technical Team

The National Technical Team was led by the Assistant Secretary for Research, Evaluation and Statistics and coordinated by the Director of Statistics of the National Department of Education. The composition of the national team included senior level staff from the National Department of Education (NDOE), Department of Higher Education, Research, Science and Technology, Department of National Planning and Monitoring, and Department for Community Development. A list of the team members can found in the annex.

The role of the National Technical Team (NTT) was discussed with team members, who were informed that the improvement of the data collection processes for education statistics should be led by the country -.ie. the NTT. The Code of Practice (COP - refer annex) was presented and the purpose of the COP was discussed. The COP provides guidelines for the national team on data quality assessment to assure credible education statistics at national level and provides a set of standards and principles accepted globally. The COP and related indicator matrix enables the benchmarking of the education statistical system against international standards and indicates where technical support is needed to strengthen compliance with the standards.

The national team was provided with basic training on the revised DQAF methodology[6], covering the eight principles of data quality and their indicators. The team was provided with instructions on how to complete the scoring matrix for each indicator, including guidance on the rubric for each level, providing comments and evidence of existing practice and recommendations for improvement. The interview protocol for consultations with key stakeholders was presented and discussed. Five key interview questions and follow-up prompt questions were rehearsed. These were: Can you please, briefly:

1. explain the way you collect educational statistics in this country / in this institution?

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[6] Refer to annex for the methodology of the revised Ed-DQAF.

2. explain how decisions are made about which data are collected?
3. say something about the organisational context of your work?
4. explain how data in your unit are being processed and analysed?
5. explain how data produced by your unit are being published / disseminated / made public?

Following the completion of the consultations, the mission and national teams met to discuss and finalise the scoring of the matrix. The scoring was completed only for the administrative routine systems of the education sector and covered the domains of institutional environment, statistical processes and statistical outputs. The scoring for the different data quality indicators was based on the following rubric: 4 = fully meets standards 3=meets most of the standards 2=meets few of the standards and 1= does not meet standards. The scoring was also mediated to reflect national priorities for the development of education statistics. The results of the compiled scoring for each principle and indicator are shown in the annex.

4.2 Evidence Gathering

The team members consulted with key education sector agencies, especially the National Department of Education, including the Deputy Secretary of Education, the Secretary-General of the National Commission for UNESCO, and the Assistant Secretary for Research and Evaluation. The team also met with the Manager, Statistics & Data Management and the Manager, Policy & Strategic Planning from the Department of Higher Education, Research, Science and Technology. The team met with the Community Learning and Early Childhood Development Divisions of the Department for Community Development, and with the National Training Office and the National Apprenticeship and Trade Testing Board. In addition to education sector agencies, the team also visited other national agencies such as the Department of National Planning and Monitoring and the National Statistical Office. The team also visited Department of Foreign Affairs and Trade staff at the Australian High Commission and the United Nations Country Team based in Port Moresby.

The team conducted interviews using the revised DQAF methodology[7] to assess the quality of education statistics in three broad domains, institutional environment, statistical processes, and statistical outputs. The team asked probing questions on the eight principles of data quality: policy and legal framework, adequacy of resources, user relevance, sound methodology, accuracy and reliability, periodicity and timeliness, data consistency, and accessibility and clarity. The responses to the questions were then recorded and analysed using a matrix template that scored the observed practices related to each dimension.
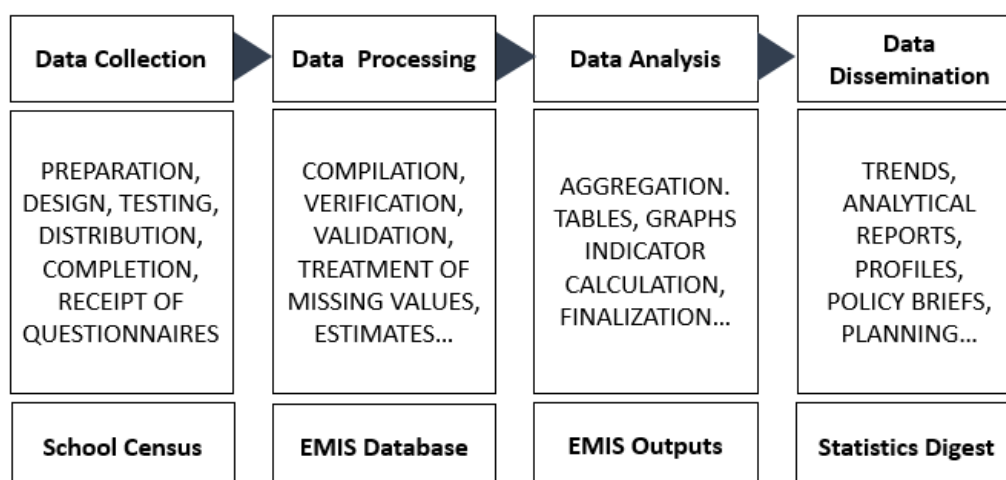
Documentation of the observed practices were gathered and analysed to provide supporting evidence for the interview responses. This included education acts, policies and regulations, education sector plans and reports, annual education statistical digests, EMIS documentation, and UIS questionnaires. The observations and documentation for each principle of data quality were then synthesised and form the basis for the analysis of the findings. The current state of the EMIS database was assessed in relation to the data production chain: covering the main stages of data production: viz. data

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[7] UNESCO Institute of Statistics (2017) Code of Practice for Ministries of education in charge of statistics produced and disseminated through administrative routine data systems.

collection, data processing, data analysis and data dissemination. Figure 3 shows the key activities of the data production chain:

Figure 4.1 Data Production Chain

Data Collection	Data Processing	Data Analysis	Data Dissemination
PREPARATION, DESIGN, TESTING, DISTRIBUTION, COMPLETION, RECEIPT OF QUESTIONNAIRES	COMPILATION, VERIFICATION, VALIDATION, TREATMENT OF MISSING VALUES, ESTIMATES...	AGGREGATION. TABLES, GRAPHS INDICATOR CALCULATION, FINALIZATION...	TRENDS, ANALYTICAL REPORTS, PROFILES, POLICY BRIEFS, PLANNING...
School Census	EMIS Database	EMIS Outputs	Statistics Digest

4.3 Consultation Meeting

Following the completion of the individual key stakeholder consultations, a meeting was held to formally present the findings and discuss the recommendations from the data quality assessment. All education sub-sectors were represented: i.e. early child development (ECD), elementary, primary and secondary schools, technical and vocational and training (NDOE) and higher education (DHERST). In addition, staff from the DNPM and DFAT also attended. The government was represented by the Deputy Secretary of Education who chaired the meeting.

> **Key Agency Stakeholders Consulted**
> National Department of Education
> NCD Provincial Education Authority
> Department of Higher Education, Research, Science and Technology
> Department of National Planning and Monitoring
> Department of Community Development
> National Training Council
> Australian Department of Foreign Affairs and Trade

The UIS/SPC mission team, on behalf of the national team, presented the data quality assessment of the education statistical system in Papua New Guinea. The team outlined the purpose of the DQA mission, the structure of the DQA framework, and the methodology of the DQA, including the scoring of the matrix. The team presented the findings and the national team contributed to the discussion of the recommendations for each of the domains of data quality. For each domain, the meeting attendees were asked to comment on the importance, appropriateness and relevance of each recommendation.

The discussion of the recommendations centred on the need for a new education data platform to bring together all the different education data, including SDG 4 indicators which requires new approaches to data collection and reporting. It was suggested that the framework of the National

Strategy for the Development of Statistics, which has recently been drafted by DNPM and referred to as the PNG SDS, could form the basis for the development of an education data platform that could provide sector-wide timely statistics for national monitoring purposes, including the monitoring of the SDGs. Data would need to be obtained not just from administrative sources, but also from population census and household surveys, as well as government budget and finance statistics. There was a critical need for coordination of statistical activities in the education sector; a statistics working group, led by the DNPM as custodian of the PNG SDS, will be established and include both NDOE and DHERST.

The data platform requires a higher level of integration across different sectors as well as education sub-sectors. For example, between education and health for the immunization of school children or between labour and TVET for workforce planning. Within the education sector, there is a need to link NDOE data with DHERST data so that information on transitions between secondary schools and higher education can be monitored. Early childhood care and education is outside the mandate of NDOE and therefore there is a need to connect with DCD, which has the mandate on early childhood education to demarcate boundaries between the ECCE and school sub-sectors. It is essential that government and development partner agencies collectively work on the challenges to integrate data across the education sector, for both public and private institutions, to show the extent and growth of education sector in the country.

The data platform would be useful to enhance the use of data in policy development and decision-making. It is important to gain insights from the data, present the data using visualisation and infographics, and tell a story for users. This is important at the senior levels of education management which require quality evidence for policy formation and monitoring.

5. Data Quality Assessment Findings

Institutional environment

The relevant principles of data quality for the institutional environment are: policy and legal framework, adequacy of resources, and relevance to user requirements. The overall assessment ratings for each principle and indicator are shown in Table 1 in which the colours have been used to indicate how much the quality standard have been met for each of the principle and its modalities, where the policy and legal framework, the adequacy of resources and relevance met few of the quality standards.

Figure 5.1: Rating of Principles for Institutional Environment
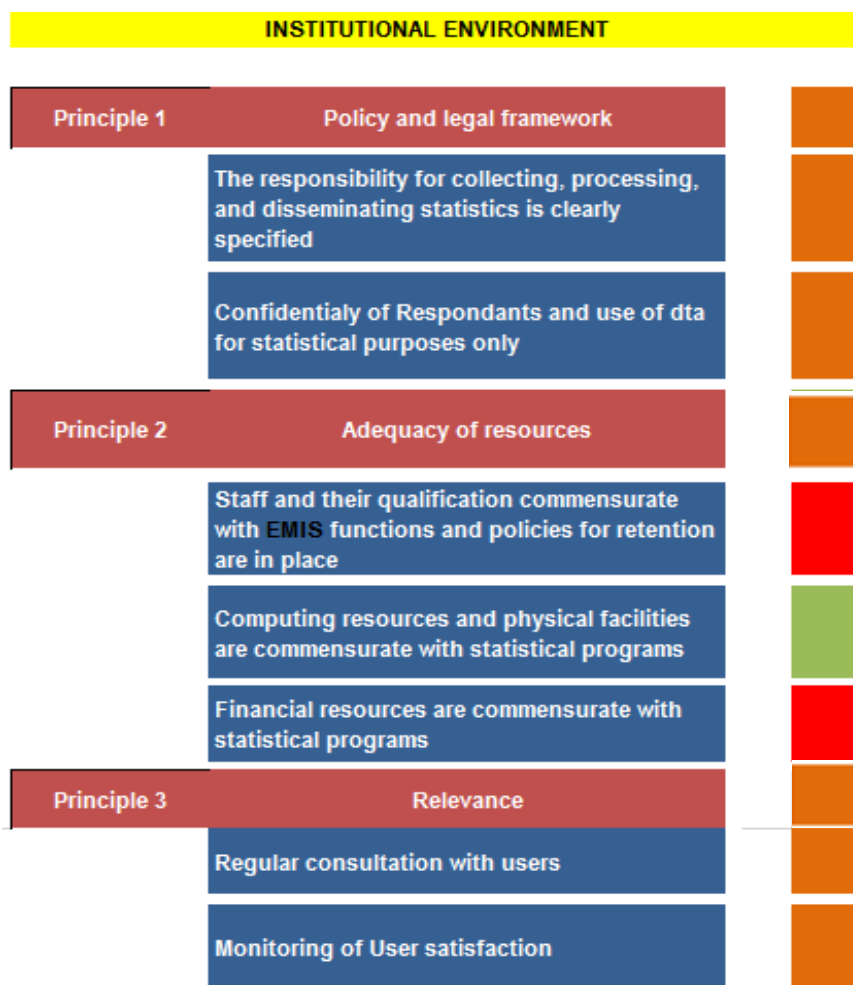
Key:

Principle 1: Policy and legal framework

The legal and institutional environment governing education statistics have a significant influence on the effectiveness and credibility of the National Department of Education to produce and disseminate education statistics. The two indicators of the policy and legal framework: viz: responsibility for producing statistics and the confidentiality and statistical use of education data are both rated as meeting some or few quality standards.

Table 5.1: Rating of Indicators for Policy and Legal Framework

No.	DQAF Indicator	Average Score	Standards rating
1.1	Responsibility for collecting, processing, and disseminating statistics is clearly specified	2.3	Met some standards
1.2	Respondents' data are to be kept confidential and used for statistical purposes only	2.0	Met few standards

The National Education Act 1983[8] provides the legal basis for the responsibility of the Secretary for Education for the supervision of its implementation of approved plans and policies in relation to education. While the responsibility for collecting, processing, and disseminating statistics is not specified in the act, the NDOE has developed a draft EMIS policy that provides a legal mandate for the collection and production of national education statistics. The policy states: "the Department of Education is mandated to monitor the growth and expansion of national education system for all education sectors registered with the national education system." Specifically it provides for mandatory and compulsory data collection for all schools registered within the national education system. The NDOE Research, Evaluation and Statistics Division has the overall responsibility for the management, administration, and planning of data collection, data entry, data analysis, reporting and use in various NDOE decision making process. Specifically the EMIS and Statistics unit of NDOE is responsible for the collection of education data from schools.

The EMIS and Statistics unit is informed of the education data collected by other government agencies, though no formal consultation or data sharing arrangements exists. For example, NDOE is aware of the data collected on teachers by the Teachers Services Commission (TSC) but there is no coordination of data collection between NDOE and TSC. Similarly, the Department of Higher Education, Science and Technology collects data on tertiary education, though there is no data sharing arrangements between the two agencies[9]. There is also a lack of integration of information held in the EMIS with other NDOE databases, or with education sector data held by other government agencies. For example, student data on examinations and assessment and student attendance data

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[8] A process to amend the Education Act was started in 2014 by the DoE and will be table in Parliament in 2018.
[9] The lack of data sharing agreements between government agencies is corroborated by the SABER EMIS 2015 assessment which found that "processes to share data with other government agencies are neither clearly defined nor detailed in policies".

collected by NDOE are not integrated into the EMIS.

The National Education Plan (NEP) 2015-2019 specifies a new focus area on system strengthening with a key strategy to improve communication and access to information across the NDOE and all levels of education. This includes linking national, regional, provincial and district education offices and post-primary schools using ICT; upgrading regional and provincial ICT infrastructures; establishing or convert current data systems to provide one fully integrated digital information system; replacing paper-based records with integrated electronic records management system to improve access to information; and improving information management and archiving.

The NEP provides the authority for the ICT unit to manage and improve information systems to store and access quality data to support policy and planning processes. The plan states: "ICT will underpin all administrative processes and information systems, with connected systems allowing rapid access to accurate information for streamlined service delivery. Provinces and schools will be encouraged to take responsibility for the decentralised administration enabled by ICT" (p49). A new focus area in the NEP is system strengthening and sets system strengthening targets for school data collection; that is, 100 percent of schools submit school census data and 60 percent of provinces submit EMIS data electronically.

The Higher Education General Provisions Act (2014) requires the Department of Higher Education, Research, Science and Technology (formally the Commission for Higher Education) to report on the status of higher education in Papua New Guinea, especially in regard to the monitoring national plan for higher education. This includes reporting statistics on enrolment patterns and programme offerings at registered higher education institutions. While the Higher Education Act provides the authority for collection of data from higher education institutions, there is no policy that protects the confidentiality and privacy of an individual's data. Currently there is no EMIS policy developed by DHERST that outlines the procedures for protecting student and teacher data, and there are no written assurances that individual data will only be used for statistical purposes.

There is no formal role for the National Statistical Office (NSO) recognised by NDOE in the collection and production of education statistics. Therefore the statistical activities of the EMIS and Statistics Unit are not governed by national or international statistical methods and standards. However there is a national classification of education data maintained by the NDOE and statistical standards are applied to the data collection and production processes, although these may be different from those employed by the NSO. The EMIS and Statistics unit could benefit from attending regular meetings with the NSO for advice on statistical methods for data collection, processing and analysis, especially in regard to ensuring the data production processes meets expected quality standards.

In the EMIS policy there are documented provisions for ensuring students and teacher data are kept confidential and used for statistical purposes only[10]. In particular the Statistics Division has the responsibility of ensuring the protection of school data in the EMIS. The policy states "…information which may be considered private or protected must not be disclosed." However there is no reference in data collections forms sent to schools on confidentiality or use of the collected data. NDOE has a policy for ensuring individual data are used only for statistical or research purposes only, by ensuring

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[10] This is an improvement since the SABER EMIS 2015 assessment which found that NDOE policies do not currently mandate that respondents' data be kept secure, nor define processes and procedures to keep data secure.

that institutions or individuals requiring information from EMIS must clearly state the purpose, objectives, types of information, audience and expected benefits of the study in writing for approval from the Secretary of Education for provision of data. Nevertheless there is evidence that the data protection and confidentiality provisions are not always applied.

DHERST coordinates its data collection activities with NDOE to avoid areas of duplication, though there still areas of overlap in the coverage of the institutions. For example both DHERST and NDOE collect data on teacher training programmes provide at universities. However there have been on-going consultations to resolve the issue, and there is an informal understanding about the mandates for data collection by both agencies. The NSO has not been involved in the consultations and plays no active role in mediating disputes over statistical issues between the education agencies. The NSO could make an important contribution to the quality of education statistics by ensuring that the PNG Qualifications Framework[11] is extended to cover the entire education sector.

Principle 2: Adequacy of Resources

The National Department of Education needs to ensure that resources are commensurate with the statistical programmes, personnel, facilities, equipment, technology, training and financing of their education management information systems. The three indicators of the adequacy of resources are respectively rated as not meeting quality standards for staff and qualifications as well as financial resources, while most standards are met for computing and physical resources.

Table 5.2: Rating of Indicators for Adequacy of Resources

No.	DQAF Indicator	Average Score	Standards rating
2.1	Staff and their qualification commensurate with EMIS functions and policies for retention are in place	1.0	Met no standards
2.2	Computing resources and physical facilities are commensurate with statistical programs	2.7	Met most standards
2.3	Financial resources are commensurate with statistical programs	1.0	Met no standards

Limited qualified and skilled staff have been allocated for EMIS functions and policies for retention of staff have not been developed. At both national and provincial levels, the EMIS functions are shared with other data collection and statistical activities, and therefore there is no dedicated staff specifically allocated to EMIS operations[12]. Most EMIS and Statistics unit staff are involved in manual data entry of school census data into the EMIS system. A key priority of NDOE is to improve

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[11] Currently the PNGQF framework covers the TVET sector for private training provider establishments (NTC, 2016)

[12] This finding is supported by the SABER EMIS 2015 assessment which found that the lack of staff to support EMIS poses significant challenges. For example, in some provinces, one person is assigned to support EMIS; however, he or she also holds another position and responsibilities.

the speed and accuracy of data inputted into the EMIS[13]. A technical adviser, funded by DFAT, is currently assisting the EMIS and Statistics unit with the operational management and development of the EMIS system. One of the intended outcomes from the EMIS policy, which has not yet been implemented, was to increase the EMIS and Statistics unit staff capacity in the entire data production process. This includes the designing of data collection tools, data collection processes, data entry, data validation and verification, data analysis and report writing, and dissemination of the information at all levels of decision making process.

There is an insufficient number of DHERST staff available to perform the AISHE data processing tasks, which often results in delays to the production of statistical reports. A number of staff are engaged in working with higher education institutions to assist with the compilation of data from institutional registry systems. The shortage of staff has been alleviated by the placement of a DFAT-funded adviser who is assisting with the operation and development of the AISHE database. DHERST staff are benefiting from training in data management, including data analysis, which ensures a transfer of skills to sustain the AISHE operations. The impact of limited staff working on the AISHE should also be mitigated by the use of technology to directly transfer of institutional records into the database system.

Overall the office environment for compiling statistics are adequate to perform the required EMIS tasks. In particular there is a good computing environment with file server and computer workstations maintained by the NDOE ICT unit. The EMIS database (Oracle) is fully functional and the hardware is working well, having been recently upgraded by an ICT technical consultant. There have been recent changes to the data entry process, with a number of provinces entering school census data directly into the EMIS system which has required additional computing resources. Also a recent IT development is the MySchool Applications which allows for schools to enter data electronically into the census form and submit online to NDOE. Currently there is adequate data protection and security through backup systems by the NDOE ICT unit. While there is sufficient physical facilities for EMIS and Statistics unit staff, there is no separate space provided for the data entry of census forms into the EMIS system.

The ASIHE data is loaded from Ms-Excel worksheets provided by educational institutions into an Ms-Access database. Data are them summarized using Tableau software. The system has been recently developed and currently contains three years of statistical data (2015-17). However data from previous years can be reported at aggregate levels, such as by institution. There is sufficient computer hardware to efficiently operate the database, but the hardware and software capacity will need to be reviewed as further database developments are put into operation. For example, the capacity of MS-Access is rather limited in managing large amounts of unit-record data, such as institutional records of student enrolments, graduates and staffing, and does not allow for multiple online entry and management of data records by higher education institutions.

As there is no specific budget for EMIS operations, the financial resources for processing data and compiling statistics are difficult to assess as the NDOE operational funding provides for the financing of the entire Research, Evaluation and Statistics Division. The SABER EMIS 2015 assessment comments that "without an explicit EMIS budget, the EMIS unit lacks the autonomy and planning

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[13] Department of Education Corporate Plan 2016-2018 p12.

capabilities to strategically advance EMIS to the next level". However given the delays in data processing of census forms, it is fair to surmise that the funding of staff positions is generally inadequate to perform the required tasks to process the school survey data. The NDOE budget also does not indicate the amount of funding provided to NDOE provincial offices for the processing of school census forms. Furthermore the funding of the development or extension of the EMIS system is not budgeted for in NDOE finances and requires external funding from development partners. There is a proposal to make enhancement to the EMIS system depending on funding; DFAT and UNICEF previously funded EMIS resources and developments but the funding has become more restricted. However there is no costed EMIS development plan for integration of other data sources, such as examinations and assessments and school registration data.

Principle 3: Relevance

To be of good quality, education statistics need to meet the needs of users. The two indicators for the relevance of statistics: user consultation and user satisfaction are both rated as meeting few quality standards.

Table 5.3: Rating of Indicators for Relevance

No.	DQAF Indicator	Average Score	Standards rating
3.1	Consultations with data's users are done periodically	2.0	Met some standards
3.2	User satisfaction is monitored on a regular basis and is systematically followed up	2.0	Met some standards

While there is no regular national meeting of key education data users to consult on data needs, regular consultation with key stakeholders at provincial level does takes place: for example, regular consultation meetings are held between education stakeholders and provincial education office to coordinate data collection activities. At the national level, there are ad-hoc consultations with key sector stakeholders, such as DHERST, but the NDOE has not established a formal consultation processes with the sector. Key stakeholders often request data from NDOE that is collected by other government agencies. For example, TVET statistics are difficult to compile as the data may not be collected by other agencies, such as NTC. The Department of National Planning and Monitoring (DNPM) coordinates cross-sector consultation on data needs, especially for SDGs, and depending on national government priorities, can play an important role in coordinating meetings between education sector agencies. The NSO does consult with the NDOE concerning the type of education questions that should be included in national household surveys, such as DHS and HIES.

In the EMIS policy there is no documented process for reviewing the content and format of the national school census, though one of the expected outcomes of the policy is to increase the involvement of decision makers contributing to information about the different types of data to be collected. While there are provisions in the policy for the EMIS and Statistics unit to manage,

administer and plan data collection, it is unclear what the process is for making changes to the data collection forms in response to stakeholder needs. The review procedures should also involve evaluating the efficiency of the census process itself and as well as identifying improvements that can be made to enhance the quality and efficiency of next year's process. Due to limited resources, however, no report on stakeholder feedback has been prepared. International guidelines[14] suggest that a sector-wide data user working group meets regularly to discuss the scope, coverage and quality of data collected for producing national education statistics.

There is no process for monitoring key stakeholder satisfaction with education statistics that are produced at either national, provincial or school[15] level; any feedback received is on an ad-hoc basis. The reviewing of stakeholder feedback is an important activity that should start as soon as major annual publications are produced following the school census process. Feedback received from external stakeholders regarding the quality of information produced by the school census process (e.g. feedback on the accuracy, content and structure of the Statistics Digest) should be passed on to the EMIS and Statistics unit. As indicated in international best practise guidelines, a data user satisfaction survey be regularly conducted for key education stakeholders to ascertain the extent to which available education statistics are meeting the needs of the sector. Also the education statistics digest could include a user feedback form so that improvements can be made in the content of the publication.

NDOE recognises the importance of using data and statistics for decision making at the operational level to implement educational policy and facilitate planning for education programs, such as the Tuition Fee Free (TFF) policy. However NDOE management do have concerns about the data supplied by schools may not be credible to produce quality information for the TFF process. It is critical that the data collected and provided to NDOE is quality assured to ensure it is fit for purpose – i.e meets expected quality standards. This is important given the new restructure of the national education system, which will be trialled in National Capital District and Gumine district in Simbu province. The school structure changes will present a challenge to the quality of data collection and reporting; there is a need to ensure the changes do not affect data collected from schools and reported in national publications.

As pointed out in the SABER EMIS 2015 assessment, the importance of data utilisation is articulated in plans and policies, and there is now evidence that there is a demand for data and that data driven decision making is being practiced. For example, the NDOE Planning Division needs to know how many staff have received teacher training. However no data is being collected and information is not there to inform planning. There is a need for better understanding of education system issues from provinces. There is a challenge in maintaining the NDOE enrolment projection model which needs local capacity strengthened to ensure the on-going use of the model, especially at provincial and district level. It is critical to ensure that the government policies on teacher-student ratio are being met.

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[14] Code of Practice for Ministries of education in charge of statistics produced and disseminated through administrative routine data systems, UIS 2017
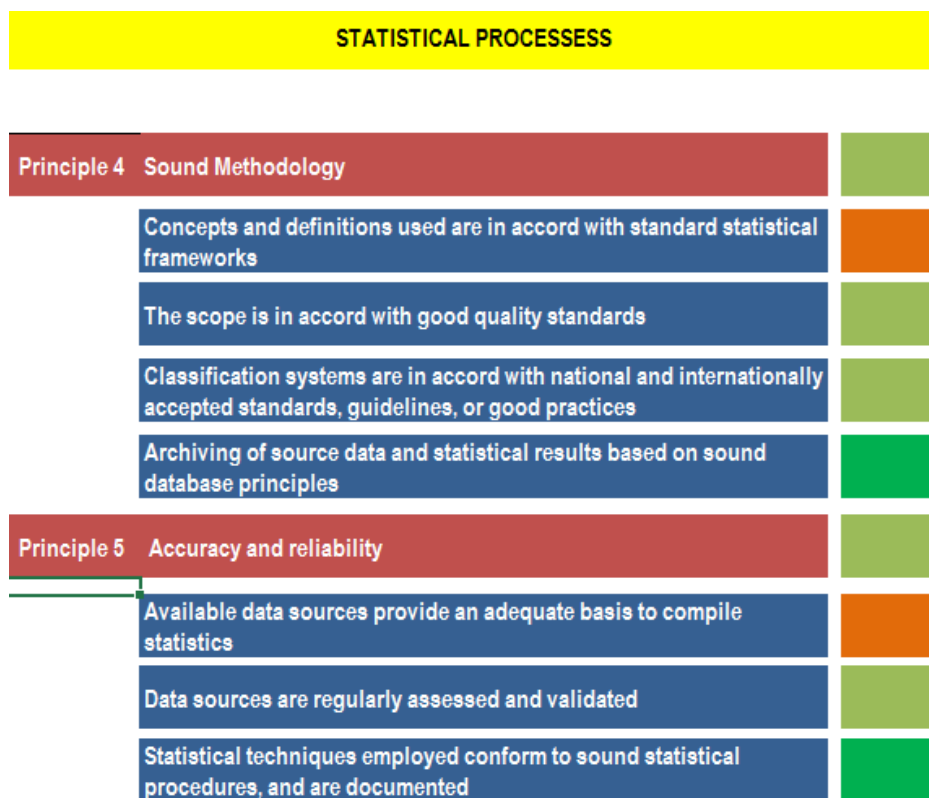
[15] This is supported by the SABER EMIS 2015 assessment which found that policies that guide the flow of information back to schools do not exist. The assessment suggests that a "feedback loops create an information cycle that brings EMIS analysis back to the school level and can ultimately improve response rates and accuracy of data".

There is no evidence that regular consultations by DHERST with key users of higher education data are planned, though adhoc consultations with NDOE and DNPM do take place. The information collected and reported in statistical reports are largely determined by the requirements of the Higher Education General Provisions Act 2014 and the policy and planning requirements of the DHERST. That is, the purpose of the Annual Survey of Institutions of Higher Education (ASIHE) is to track the sector's progress against the Government's development targets and to provide information for policy formulation, programme planning and project management. However no formal survey is conducted by DHERST to ascertain the satisfaction of data users with the statistical reports.

Statistical Processes

The relevant principles of the quality of statistical processes are methodological soundness and accuracy and reliability. The assessment ratings for each principle and indicators are shown in Table 1, where overall methodological soundness and accuracy and reliability met most quality standards.

Figure 5.2: Rating of Principles for Statistical Processes

Key:

Principle 4: Sound Methodology

The methodological basis for the education statistics needs to follow internationally accepted standards, guidelines, or good practices. The assessment of the indicators for sound methodology found that apart from the concepts and definitions, the classifications, scope and coverage and archiving of data mostly meet the expected standards.

Table 5.4: Rating of Indicators for Sound Methodology

No.	DQAF Indicator	Average Score	Standards rating
4.1	Concepts and definitions used are in accord with standard statistical frameworks	1.5	Met few standards
4.2	The scope is in accord with good quality standards	3.0	Met most standards
4.3	Classification systems are in accord with national and internationally accepted standards, guidelines, or good practices	3.0	Met most standards
4.4	Archiving of source data and statistical results based on sound database principles	3.5	Met almost all standards

Although there is no documentation on statistical concepts and definitions used in the EMIS[16], the national school census forms and the education statistics publications indicate that they are generally in accord with national statistical frameworks which reflect the national education system. For example the information in the 2015 Education Statistics report contains information related to the data of the National Education System (NES) which includes state and church authority schools and the Permitted schools system, which the majority is run by the International Education Agency (IEA). However, while the data can be compiled according to international statistical frameworks, there is no evidence that international standards have been applied. For example, the education statistics reports produced by NDOE do not include a glossary of statistical concepts or definitions. It is understood that the EMIS data sets do use, at least partially, standardised concepts and definitions, although there is no evidence that different datasets in NDOE use the same concepts and definitions. It is recommended that reference documents for the production of national education statistics, including data collection, processing and analysis, should be further developed. There also is a need for a review of data definitions and concepts used in other NDOE datasets to ensure standardisation of definitions.

There is no documentation of the statistical concepts, definitions, and classifications used by DHERST in the Annual Survey of Institutions of Higher Education (ASIHE) Reports. In particular, there is no classification for the level of program or field of study which would allow for statistics to

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[16] The SABER EMIS 2015 report claimed that metadata documentation exists that included details about the compilation of the NEP indicators. However, the NDOE were unable to locate this document and was not known to the DQA national team.

be produced for the UIS questionnaire on tertiary education. As with the TVET sector, there is a need for a national qualifications framework for higher education to guide the production of tertiary education statistics. As is best international practice, a glossary of statistical terms used in the analysis of the tables would assist the reader to better understand and interpret the data. For example, definitions for enrolments/students; full-time/part-time; and program/mode of study should be presented in the report.

The scope of data collection is partially aligned with internationally accepted standards and guidelines. That is, most of the educational institutions in the national education system are covered in the data collection (i.e. all public schools in the National Education System (NES) and private schools that include International Education Agency (IEA) are surveyed by the NDOE). However there is no data collection of data from early childhood care and education (ECCE) sub-sector, which is the responsibility of the Department of Community Development (DCD). The NDOE collects data from elementary, primary, community, and high schools as well as publicly funded vocational schools. However data on private TVET providers registered by the National Training Council (NTC) are not collected or reported.

DHERST collects data on higher education institutions in the 2015 Annual Survey of Institutions of Higher Education (ASIHE), and includes some public training institutions that operate under various government departments. However, not all higher education institutions (universities and associated campuses, teachers and nursing colleges, technical and business colleges, and other higher education colleges) participate in the survey. There is also an overlap in data collection between NDOE and DHERST in regard to technical and business colleges as well as the University of Goroka, because of NDOEs' interest, in the number of secondary teachers trained by the University. There is no data collection of the non-formal or adult education sub-sector, although NDOE does collect data for students enrolled in Flexible Open Distance Education (FODE) which is aggregated and reported in EMIS.

While disability questions are included in the school census forms, there is a separate detailed form for disability which are sent to the 23 Inclusive Education Resource Centres. EMIS only captures disability information from the census form for mainstream schools where data are aggregated for the number of students with special needs or disabilities by grade and gender. However there are no definitions of disability and no specifications of the different types of disability to be reported. While no training is provided directly to the head teachers on how to fill in the forms, the NDOE is taking a trainer of trainers approach to train school inspectors who can then reach out to train head teachers and deputy head teachers.

As Papua New Guinea is a large country, and the NES is administered at provincial level, geographical boundaries within the EMIS are consistent with statutory and administrative regions. For example, the statistics reports provide statistical tables broken down by the 23 provinces (including National Capital District and Kiunga Lake Murray District) and provides a map showing the location of the provinces of Papua New Guinea

Classification systems are generally in agreement with national and internationally accepted standards, guidelines, and good practices. An agreed ISCED 2011 mapping file, including classification of the entire education system exists (i.e. includes early childhood and pre-school

education, primary and secondary education, vocational and technical education, and tertiary education), but is not embedded in the EMIS system. It is recommended that a report be created within EMIS to produce data for UIS questionnaires using the ISCED mapping. As the education sector, is undergoing changes in the structure of the school sector, it is important that the national classifications of class levels used in the EMIS are updated to account for changes in the nomenclature.

Relational database principles are generally applied in the EMIS database. For example, in the EMIS database structure, referential integrity is always applied and the naming of variables and tables is standardised. However with proposed changes to the EMIS system, the database design should be reviewed to ensure the principles are applied in the updated database. While EMIS stores all information in the national school census, there is a need to develop EMIS further to include other data sources e.g. school registrations, and assessment and examinations. Technical database documentation is partially available, but is not integrated into a technical manual that could be used by data users. In keeping with best practise, a user manual should be developed that can be used for training NDOE staff on the structure and operation of the EMIS system.

Principle 5: Accuracy and reliability

Data sources and statistical techniques need to be sound and education statistical outputs need to sufficiently portray reality. The three indicators of data accuracy and reliability are respectively rated as follows: data sources meet few quality standards, data validation meet most standards and statistical techniques meet all standards.

Table 5.5: Rating of Indicators for Accuracy and Reliability

No.	DQAF Indicator	Average Score	Standards rating
5.1	Available data sources provide an adequate basis to compile statistics	1.7	Met few standards
5.2	Data sources are regularly assessed and validated	3.0	Met most standards
5.3	Statistical techniques employed conform to sound statistical procedures, and are documented	3.5	Met almost all standards

The available data sources in EMIS provide an inadequate basis to compile comprehensive and sector-wide statistics. For example, the data source covers only partially the expected required information to populate SDG4 indicators. As the scope of the data collected in the NDOE and DHERST EMIS is limited to the school and higher education subsectors, not all data for producing SDG indicators are available in EMIS, especially for early childhood development and education. In addition, there is a need to integrate data within sub-sectors for producing SDG indicators, e.g. literacy and numeracy assessments are not currently available in the EMIS system. Although a list of schools is available in the EMIS, the official school registration data is not integrated into the system so that the maintenance of the school list requires additional management. In general, age is calculated

based on years of birth for students enrolled at 4 March, however in most cases, birth certificates and other legal documents are not used by the school for verification purposes[17].

For higher education, a list of institutions is available and maintained by DHERST to ensure all relevant institutions are surveyed. However not all institutions respond to the survey which typically has an 85 percent response rate. However with compensatory adjustments, such as using historical data to substitute for missing survey returns, statistics are able to be compiled from the DHERST EMIS to populate the SDG 4 indicators, especially for student participation and graduation rates. The age data is usually accurate as it is calculated from date of birth provided by institutions which require students to provide a legal document.

EMIS data are not annually audited to check the accuracy of source data following the completion of data collection. However, the national census forms are externally verified. According to the draft EMIS policy, data has to be monitored and verified by School Inspectors, Provincial Census Coordinators and Regional Census officers. The census forms include declarations for accuracy and completeness by the person completing the form (usually the head teacher or Principal) and by the standards officers who validate and verify the data as complete, correct and accurate. The form is certified by the Provincial Education office before it is sent to the NDOE. To assure the quality of data, school inspectors should regularly check EMIS data against the school register to verify data when visiting schools.

Information is compiled on coverage, non-response and missing data, though while statistics on response rate is produced every year, there are no published response rates or analysis of missing data. It is recommended that statistical publications report response rates by province and the adjustments made to ensure accurate and consistent reporting. At the school level, mechanisms are in place to ensure that standardised school registers, including students and teachers details, are maintained, assessed and used to report student enrolments to the NDOE.

The statistical techniques used in EMIS data processing generally do conform to sound statistical procedures. For example, the data collection instruments for the National School Census are designed appropriately for computer processing, but were not pilot tested with a sample of respondents before being implemented. The data contained in the forms are easy to validate and there are instructions in a national school census checklist that guides NDOE staff at the provincial and district offices when checking the completeness and correctness of data in the census forms. According to the SABER EMIS 2015 report the EMIS also uses automated processes to validate data and flag discrepancies. However there is no EMIS data processing manual that explains to how to process student and teacher data returned in the census forms[18]. Item imputation methods exist and are implemented, but there is no documentation for reporting purposes.

There are no documented imputation techniques to account for missing school census forms. Around 15-20% of schools do not complete a school census form each year, including some schools which have been newly registered. For non-responding schools the NDOE uses previous years' census forms to estimate enrolment data by making assumptions about an average transition rate for each

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[17] It's important to note that there is a huge challenge with verification of student birth dates due to the lack of birth certificates, especially in rural areas.

[18] The SABER EMIS 2015 report claimed that an EMIS operations manual existed that details data validation processes. However, the NDOE were unable to locate this document and was not known to the DQA national team.

school level and calculating a school transition rate by grade. In some cases, queries on missing or inconsistent school information as to be referred to the Provincial Education Agencies for checking and correction, though there are no statistics kept on the number of type of referrals. If there are inconsistencies, the NDOE Planning Division refers to examination data to obtain corroborative evidence of data used for estimating growth of student enrolments for planning for teacher establishment and school infrastructure.

The quality of data provided by higher institutions is checked upon receipt by DHERST staff, who also visit institutions to assist with compilation of registry data for the survey. While there is no formal external audit to quality assure higher education data, institutions are encouraged to update and correct the data presented in the survey report, as are data users who are also encouraged to contact the concerned institution if errors are detected. As noted in the survey reports, the accuracy of the statistics depends on a number of factors including: the actual completion of the data instrument by the individual institutions; proper completion of data instruments; the data returns; and discrepancies between sources and the data submitted. On receipt of data from institutions, DHERST conducts data validation checks and has a documented procedure for cleansing the data before producing final statistics.

Statistical Outputs

The principles for the quality of statistical outputs are periodicity and timeliness, consistency and accessibility and clarity. The assessment ratings for each principle are shown in Table 3, where overall periodicity and timeliness met few standards, and consistency, accessibility and clarity meet most standards.

Figure 5.3: Rating of Principles for Statistical Outputs
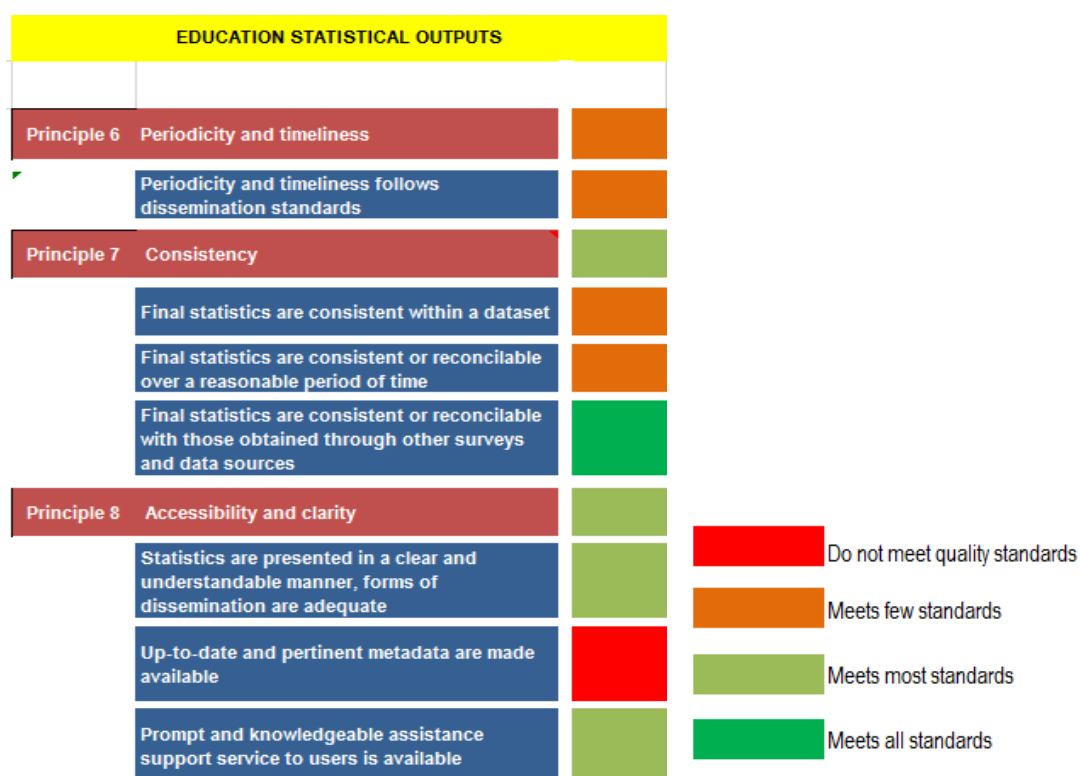
Principle 6: Periodicity and timeliness

Education statistics need to be released following internationally accepted periodicity and timeliness. However the indicator shows that the regularity and timeliness of education statistics follows only a few dissemination standards, especially in relation to data releases.

Table 5.6: Rating of Indicators for Periodicity and Timeliness

No.	DQAF Indicator	Average Score	Standards rating
6.1	Periodicity and timeliness follows dissemination standards	2.5	Met few standards

The National School Census is conducted annually and is managed and administered by the Provincial Education Boards (PEB) under the guidance of the EMIS and Statistics unit of NDOE which has overall responsibility for the conduct of the annual census. According to the draft EMIS policy, all elementary, primary, secondary, vocational, technical and business colleges, inclusive education centres, teachers colleges and permitted schools registered in the national education system are required to submit data to NDOE within a scheduled time and date following the census date which occurs in early March each year. All forms must be completed either electronically or paper base by end of March and sent to NDOE which should process the data within 20 days of receipt of the completed forms. However, due the late submission of census forms from schools and the large data processing workload and limited staff, this time limit is never complied with.

The policy states that "schools shall upload or submit all required information on student enrolment, teacher, infrastructure, WASH, school location, school financial information and school authorities in the respective fields provided either in My School Application database or on the paper-based National School Census form". While the policy instructs that National School Census completed forms shall be submitted to the school's District Education Office and then on to Provincial Education Census Coordinator in a timely manner, there is no specific timeframe specified for reporting to each administrative level of the education system. In 2016, NDOE achieved an 86% response rate which is slightly higher than the usual 80-85% response rate in previous years.

Given the delays in the data collection and processing, dissemination of EMIS data does not occur within the same school year, though this did happen for specific data required for the implementation of the Tuition Fees Free (TFF) scheme. That is, NDOE priorities specific information on student enrolments for data entry from the national school census form. In effect this means other important data are not entered into the EMIS in a timely manner; in some cases for more than a year after data collection. The delays in data processing of the national school census are a major weakness in supply quality data for all national education stakeholders. Based on current trends, the completion of the data production process takes more than two years. The latest published education statistics in hard copy form is for 2013; though there are draft publications (PDF) available for 2014, 2015 and 2016. The latest published e-copies on the PNG NDOE website are for 2008. The quality standard is for the statistical report to be published within 12 months of the census date; which due to processing delays

is not being adhered to. There no specific requirement for release of final statistics indicated in the draft EMIS policy, which should include a calendar of dates for releases of statistical data and publications[19]. Electronic copies of education statistics publications should also be made available on the NDOE website once finally approved for publication.

Each province has a provincial education plan developed a year after the national education plan; and EMIS data is used to provide evidence to support the province plan. Key education indicators are net enrolment and gross enrolment which measure the level of participation in formal schooling. However the monitoring of education plans is only produced at national level; no provincial information or reports exist. It is difficult to obtain population projections and education finance data at provincial level. Provinces collect data on number of textbooks from schools, but this operational data does not get entered into EMIS. Data is also collected by Curriculum and Assessment, Office of library, and Teacher Service Commission, but is not shared with the Provincial Education Authorities.

As a result of the data processing delays, there has been several years delay in the submission of questionnaires to UIS. The last submitted data for the ED/A questionnaire for the Survey of Formal Education was in 2016 and provided data for the 2014 school year. There has been no submission of data in 2017, though efforts are being made to compile 2015 and 2016 data for submission to UIS by the end of the year. Lack of experience of staff in completing UIS questionnaires raises the need for EMIS staff to be re-trained on completing UIS questionnaires, especially given recent changes to the content of the questionnaire to add questions for SDG 4 monitoring.

The survey of higher education institutions (ASIHE) has been conducted annually since 2010 (?) and data has been disseminated in annual reports in hard copy format and in e-copy since 2015. Education statistics are generally available within 12 months of the end of the academic year when data are collected from higher education institutions. However, DHERST does not provide internationally comparable data for the UIS questionnaire (UIS/ED/C) on tertiary education. To assist with the production of education tables for reporting at regional and international levels, higher education data should be disaggregated by level and fields of study using the ISCED classification.

Principle 7: Consistency

It is important that released education statistics are consistent within a dataset and over time, and with other major datasets. The internal consistency of data within a dataset and time-series data is rated as meeting few quality standards. However, the external consistency of final statistics with other datasets meets all the expected standards.

Table 5.7: Rating of Indicators for Consistency

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[19] Despite the lack of a data release calendar, key education stakeholders are made aware of the release of education data through official circular announcements (SABER EMIS 2015 report)

No.	DQAF Indicator	Average Score	Standards rating
7.1	Final statistics are consistent within a dataset	2.0	Met some standards
7.2	Final statistics are consistent or reconcilable over a reasonable period of time	2.0	Met some standards
7.3	Final statistics are consistent or reconcilable with those obtained through other surveys and data sources	4.0	Met all standards

Consistency checks are partially conducted amongst data aggregates within the same data-set. For example, totals of number of classes, students and teachers by grade and gender is checked against the number of students enrolled by age to ensure equivalence. Also the previous year's enrolment figures are used to verify that enrolments in each grade are not significantly greater than the previous grade in the last census year. However, in the draft EMIS policy, there is no specific requirements for data consistency checks to be conducted before releasing final statistics. To comply with international standards, more consistent data checking mechanisms should be put in place and be incorporated into the EMIS policy.

Data time-series is available continuously and consistently for five years (2009-2013) in the PNG Education Indicator dashboard, which shows a variety of education indicators in graphic form (e.g. maps, charts and graphs). The purpose of this dashboard is to support the NDOE in achieving its strategic goals by enabling officials to undertake fact-based decision-making based on reliable data; and to report education performance to the wider public in Papua New Guinea. The dashboard integrates key data from the National School Census and other sources to provide data transparency and to deliver consistent and reliable information. The aim is for officials and stakeholders to have access to information in a way that allows them to use the data effectively. However, the time-series data has not been updated since 2013, and therefore is of limited use for education monitoring of the current National Education Plan (NEP 2015-2019). As the structure of the education system changes over the next few years, the quality of the time series data will need to be reviewed to ensure that consistent data are maintained over time.

Higher education statistics are internally consistent within the dataset. The database uses referential integrity to ensure that institutional codes are correctly linked to enrolment and graduate data, and the use of student IDs ensure that that enrolment and graduate data are not duplicated or missing from the database tables. The AISHE database manual documents a procedure for ensuring the verification of data at both institutional and summary levels. A data verification workbook allows for DHERST staff to verify time-series data by assessing growth rates. However it is not possible to assess the consistency of published statistics over time as no time-series data is presented in the ASIHE reports.

Overall education statistics are reasonably reconcilable with data from other data sources, especially with the last population census (2011) and the last published Demographic and Health Survey (2006). This includes information across geographical areas (national, provinces and districts) and the levels of education, as evidenced by data tables provided in the education statistics publications. However, due to the non-availability of age data in the statistical publications, it is not possible to assess whether

enrolment by age in EMIS corresponds with age of children attending school in the population census. Furthermore, since no information is published on student assessment and examinations, it is not possible to check the consistency with population figures on education attainment. The education statistical publications should include age by grade tables to not only assist data external consistency checks, but also to provide useful information for policy and planning purposes.

Principle 8: Accessibility and Clarity

Education statistics and metadata need to be easily available in a clear and understandable manner, and there needs to be adequate user support**.** The three indicators of accessibility and clarity are respectively rated as meeting most expected standards for clarity and user assistance, but not meeting standards for the availability of metadata documentation.

Table 5.8: Rating of Indicators for Accessibility and Clarity

No.	DQAF Indicator	Average Score	Standards rating
8.1	Statistics are presented in a clear and understandable manner, forms of dissemination are adequate	3.0	Met most standards
8.2	Up-to-date and pertinent metadata are made available	1.0	Met no standards
8.3	Prompt and knowledgeable assistance support service to users is available	3.3	Met most standards

The NDOE education statistics publications contain many statistical tables, but without commentary or interpretation. They are structured similarly for each level of disaggregation, including government, church and private institutions. In line with international best practice, the data should be presented in a clearer manner, by using charts and graphs and national summary tables to facilitate concise and meaningful analysis. A good example of a concise and clear format is the DHERST report on the Annual Survey of Institutions of Higher Education (AISHE) which includes an analytical commentary and summary tables, maps and graphs on enrolments, graduates, and staffing, with the detailed reference tables included in the appendix. E-copies of the ASIHE reports are also available on the DHERST website.

Education statistics are disaggregated at national and sub-national levels by level of education. For example, the summary table presents the number of schools and enrolments by type of institution and province. Tables are also provided for student enrolments by grade and gender for each level of disaggregation. For higher education, statistics are disaggregated by type of institution rather than level of education. EMIS data coverage is confined to education sectors under the jurisdiction of the NDOE, and therefore non-formal and informal adult education programmes are not covered in the education statistics. No EMIS information is disseminated at school level; a statistical profile should be developed for each school compared to national, provincial and district totals, including all information reported in the census forms.

The EMIS dashboard provides a range of indicators that are linked to the NEP. It is mainly used by the NDOE and other central government agencies for reporting to national monitoring and evaluation frameworks. Most of the information is disaggregated at national and provincial level, and is presented in graphs and maps, but there is no school level data available. As stated by SABER EMIS "Schools and clients (e.g., parents, communities, and students) are not using EMIS. Schools are actively reporting data but rarely receiving any feedback. They are unaware of and/or unable to access the EducationInfo Dashboard". Furthermore, basic tables on student enrolments and teachers for each level of education disaggregated by gender, age, and grade are not available for download, which restricts access to basic education information for policy and planning.

As is good international practise, the education indicators as well as basic statistics tables should be incorporated into a sector wide statistical publication that could be used to monitor progress in the implementation of the National Education Plan (NEP). A link to the dashboard should also be available on the NDOE website. Metadata including information on concepts, definitions, classifications and other methodology, data sources and statistical techniques partially exists, but is not documented[20]. There are some descriptions of metadata in the EMIS database, but these are not readily available to data users. Metadata is accessible only to users of EMIS - accessibility is restricted and special access rights permit authorized persons to view metadata. Given recent changes and planned enhancements for the EMIS system, there is a need for technical documentation that informs data users of the changes made to the system. No evidence was found of metadata documentation for higher education statistics.

Mechanisms to register, monitor and respond to users request are available and there is a register maintained by the Statistics and EMIS unit to monitor data users' requests. The draft EMIS policy states that "government departments, statutory organisations, non-government organisations, private sectors, development partners and individuals seeking data shall formally submit a written request with justifications to the Secretary for Education and that approval of the requests shall be at the discretion of the Secretary for Education." Institutions or individuals requiring information from EMIS must clearly state the following in writing for approval from the Secretary of Education for provision of data, including the nature of information required, objective of the study/research, types of information required, expected benefits and provide an official letter stating that the data will be used only for the purposes intended. Technical assistance to users is provided on a request basis, however there is no systematic procedure described in the EMIS policy. There is no documented mechanism in place to respond to data user's request for higher education statistics, though this is provided on an ad-hoc basis depending on government priorities.

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[20] The SABER EMIS 2015 report claimed that metadata exists in the EMIS operations manual; however, the Statistics and EMIS unit were unable to locate this document.

6. Recommendations

This section is developed based on the issues identified in the data quality assessment findings. The recommendations are for the consideration of the NDOE and the Government of Papua New Guinea for endorsement and would guide and inform proposed activities to be developed in a future implementation plan. The proposed activities are classified according to the three principles of data quality; and aim to improve the quality of education statistics in Papua New Guinea by strengthening the institutional environment, the statistical processes, and statistical outputs.

6.1 Institutional environment

- Establish an effective coordination mechanism within the education sector for data sharing and integration of education related data, including the NSO.
- Conduct regular data user consultation to assess data needs and to incorporate emerging needs, such as SDG 4 monitoring.
- Improve the procedures for keeping respondents' data confidential and ensure consistently applied to all education data within the sector.
- Improve the level of staffing for the operation of the EMIS systems within the sector to meet national data reporting requirements.
- Improve the technical skills of staff in education EMIS and Statistics units by providing training in data management, analysis and report writing.
- Increase the financial resources for the development and operation of the EMIS systems within the sector to assure the quality production of data.
- Improve the channel of data dissemination, such as providing online tables, and regularly monitoring user satisfaction with technical assistance provide EMIS teams.

6.2 Statistical processes:

- Document statistical concepts and definitions used in EMIS and ensure these are consistently applied to other administrative datasets in education.
- Expand the scope of EMIS systems to incorporate all education institutions, including ECCE and private TVET providers.
- Assess the quality of data sources to ensure they comply with national and international standards.
- Prepare and document EMIS database (including data dictionaries and DB structure) and make accessible to data users.

6.3 Statistical Outputs:

- Develop processes to ensure more timely production of education data based on a calendar of data release dates, especially for the education statistics publications.
- Improve consistency checks of Annual School Census returns at the provincial and district levels, to improve the quality of published data
- Improve the quality of education statistical publications using charts, info graphics and text interpretation to facilitate the use of the data
- Produce and make available a metadata document to explain the concepts, definitions, classification and other methodology, data sources, and statistical techniques used.

7. Conclusion

The DQAF assessment provides the evidence (data needs, gaps, issues) for the development of the appropriate strategies for a way forward to develop statistics of education. Despite the many challenges faced by national education agencies in the collection, processing and dissemination of education data, the national EMIS systems have substantially improved over the last few years. To further improve the quality of education statistics, this report suggests several practical improvements that can be made to contribute to the overall development of national EMIS systems.

To address the weaknesses found in the national education statistical system and to implement the recommendations, this report recommends for the education sector to engage in the development of a sector wide education data quality improvement strategy. Adopting strategic planning is necessary to bring change, thus a National Strategy for the Development of Education Statistics (NSDES) is recommended to collectively manage and effectively use scarce resources to improve the education statistical systems. Government commitment in the development of this NSDES will promote a nationally led and owned framework and long-term sustainable support for the development of education sector statistics.

This strategy would respond to the education sector statistical issues raised in the assessment report. It is proposed that the NSDES should:
- Build on and expand existing policies and coordination mechanisms and best practices already observed in the country, especially the National Strategy for the Development of Statistics (NSDS).
- Take a sector-wide approach and clearly define the scope that official statistics of education should cover, clearly identify stakeholders at all levels, and define their roles and responsibilities throughout the entire data production process (i.e. EMIS policy)
- The plan for EMIS developments should build on existing systems and extend current and planned projects to include sector-wide education statistics (e.g. PNGInfo)
- Organize the production and dissemination of standards and methodologies in education statistics, in collaboration with the National Statistical Office (NSO).
- Include a stakeholder engagement strategy to ensure involvement of all stakeholders and build a sense of ownership and responsibility for all stakeholders in the education sector, in coordination with the Department of National Planning and Monitoring (DNPM).

Moreover, the NSDES should lead towards the development of a data quality improvement plan that includes prioritised and costed activities to improve the national statistical capacity in education. This improvement plan would also engage stakeholders around common objectives, train staff involved with education statistics, develop quality assurance protocols and national standards and methodologies for the calculation and definitions of statistics, including for SDG 4 and Education 2030 indicators.

ANNEXES

Summary of DQA recommendations by DQAF Principle and Indicator

Table A1: Institutional Environment

	Principle	Indicator	Recommendation
1	Policy and legal framework	Responsibility for collecting, processing, and disseminating statistics is clearly specified	• Establish an effective coordination mechanism within the education sector for data sharing and integration of education related data, including NSO.
		Respondents' data are to be kept confidential and used for statistical purposes only	• Improve the procedures for keeping respondents' data confidential and ensure consistently applied to all education data within the sector.
2	Adequacy of Resources	Staff and their qualification commensurate with EMIS functions and policies for retention are in place	• Improve the level of staffing for the operation of the EMIS systems within the sector to meet national data reporting requirements.
			• Improve the technical skills of staff in education EMIS and Statistics units by providing training in data management, analysis and report writing.
		Financial resources are commensurate with statistical programs	• Increase the financial resources for the development and operation of the EMIS systems within the sector to assure the quality production of data
3	Relevance	Consultations with data's users are done periodically	• Conduct regular data user consultation to assess data needs and to incorporate emerging needs, such as SDG 4 monitoring.
		User satisfaction is monitored on a regular basis and is systematically followed up	• Improve the channel of data dissemination, and regularly monitoring user satisfaction with technical assistance provide EMIS teams.

Table A2: Statistical Processes

	Principle	Indicator	Recommendation
4.	**Sound Methodology**	Concepts and definitions used are in accord with standard statistical frameworks	• Document statistical concepts and definitions used in EMIS and ensure these are consistently applied to other administrative datasets in education.
		The scope is in accord with good quality standards	• Expand the scope of EMIS systems to incorporate all education institutions, including ECCE and private TVET providers.
5.	**Accuracy and reliability**	Available data sources provide an adequate basis to compile statistics	• Assess the quality of data sources to ensure they comply with national and international standards. • Prepare and document EMIS database (including data dictionaries and DB structure) and make accessible to data users.

Table A3: Statistical Outputs

	Principle	Indicator	Recommendation
6.	Periodicity and timeliness	Periodicity and timeliness follows dissemination standards	• Develop processes to ensure more timely production of education data based on a calendar of data release dates, especially for the education statistics publications.
7.	Consistency	Final statistics are consistent within a dataset and over a reasonable period of time	• Improve consistency checks of Annual School Census returns at the provincial and district levels, to improve the quality of published data
8.	Accessibility	Statistics are presented in a clear and understandable manner, forms of dissemination are adequate	• Improve the quality of education statistical publications using charts, info graphics and text interpretation to facilitate the use of the data
		Up-to-date and pertinent metadata are made available	• Produce and make available a metadata document to explain the concepts, definitions, classification and other methodology, data sources, and statistical techniques used.

Education Reporting Requirements

a. National

Universal Basic Education Plan 2010-2019 Outcomes and Indicators

A ACCESS

1 Every 6 year old child enrolled at elementary prep
- Net Admission Rate

2 All children enrol at elementary prep.
- Gross Admission Rate

B RETENTION

3 A greater number of children remain in school to complete the primary cycle.
- Retention Rate

4 A greater number of children completing a full basic education.
- Completion Rate

5 All children have the opportunity to complete a full quality primary education of 6 years to Grade 8
- Prep to Gr 8 Gross Enrolment Rate

6 All children have the opportunity to complete a full nine years of basic Prep to Gr 8 Net Enrolment Rate

C QUALITY

7 All children should reach a required standard of literacy, numeracy and general knowledge as prescribed in the curriculum.
- Percentage of pupils who receive a satisfactory standard as measured by the Curriculum Standards
- Percentage of pupils completing Grade 8 who receive a satisfactory passing mark in the national exams

8 All schools supplied with relevant textbooks
- Pupil Text Book Ratio (PTBR)

9 Effective monitoring of primary schools.
- Percentage of schools receiving Standard Officers Visits Reports

D MANAGEMENT

10 Appropriately qualified teachers in all classrooms
- Percentage of Primary School teachers with a diploma qualification

11 Effective use of resources Pupil Teacher Ratio
- Effective teacher position allocation

12 All children taught in appropriately sized classes.
- Percentage of primary school classes with more than 45 students

13 Effective planning and budgeting processes in place.
- Percentage of provinces completing annual operational plans and budgets in line with approved plans

14 Removal as fees as a barrier to participation for all
- Annual elementary school fee subsidy as a percentage of NEB maximum school fee.
- Annual primary school fee subsidy as a percentage of NEB maximum school fee.

16 Students being taught in a conducive environment
- Percentage of elementary school classrooms built in permanent materials
- Percentage of primary school classrooms built in permanent materials

18 Education provided with sufficient funds.
- Public Expenditure on Education as % of total Government Expenditure

E EQUITY

19 Equal opportunities for both boys and girls
- Gender Parity Index in basic education

20 Equal opportunities for all Papua New Guineans regardless of disability.
- Percentage of Children with Special Educational Needs enrolled in schools.

21 Equal opportunities for all Papua New Guineans regardless of location.
- Difference in Prep to Grade 8 NER between highest and the lowest provinces/districts

National Education Plan 2016-2020 Outcome Indicators

Outcome 1 All children and youths have access to a complete, quality education

1.1 Transition rate, by level and gender

1.2 Gender parity index, by level

1.3 Teacher:pupil ratio, by level

1.4 Gross enrollment ratio, by gender

1.5 Net enrollment ratio, by gender

1.6 Completion rate by level

1.7 Gross enrolment ratio for ECCE

1.8 Public expenditure on education as percentage of GDP/total government expenditure

1.9 Number of out-of-school children

1.10 Number and percentage of teachers meeting national performance standards

Outcome 2 All students achieve learning standards and retention benchmarks

2.1 Percentage of students reaching satisfactory regional literacy and numeracy benchmarks

2.2 Percentage of students reaching national literacy and numeracy standards

2.3 Survival rate, by level and gender

2.4 Graduates by level

Outcome 3 Education systems operate in a timely, proactive and coordinated manner

3.1 Number of teachers put back on payroll by end of April annually compared with March payroll

3.2 Teaching position vacancies Baseline to be provided during 2015

3.3 Percentage of schools spending TFF on approved items

3.4 Percentage of schools using accounting system or combined cash book

3.5 Percentage of schools submitting acquittals

3.6 Percentage of education system budgets expended annually

3.7 NDoE annual report tabled in parliament on time with 100% coverage of budget activities

Papua New Guinea Strategy for the Development of Statistics 2017-2026
Core Education Statistics and Indicators

Indicators	Administrative Data Source	Survey/Census	Responsible Agency	Periodicity
Net admission rate	Education Annual Report	School Census, Annual Survey	Department of Education	Annually
Net enrollment rate, Gross enrollment rate	Education Annual Report	School Census, Annual Survey	Department of Education	Annually
		NPHC	NSO	10 years
Completion rate (Grade 8, 10, 12)	Education Annual Report	School Census, Annual Survey	Department of Education	Annually
		NPHC	NSO	10 years
Sex enrollment ratios (grade & age aggregated)	Education Annual Report	School Census, Annual Survey	Department of Education	Annually
		NPHC	NSO	10 years
Retention rate	Education Annual Report	School Census, Annual Survey	Department of Education	Annually
Average class size	Education Annual Report	School Census, Annual Survey	Department of Education	Annually
Teacher to pupil ratio	Education Annual Report	School Census, Annual Survey	Department of Education	Annually
Literacy rate - Youth & adult	Education Annual Report		Department of Education	Annually
	Education Annual Report	National Literacy Survey	NLAS	Annually, 5 years
		NPHC	NSO	10 years
Enrollment at tertiary institutions	DHERST Annual Report	DHERST Annual Survey	DHERST	Annually
		NPHC	NSO	10 years
Graduates (tertiary education)		Graduate Destination Survey	DHERST	Annually
		NPHC	NSO	10 years
Females in tertiary education	DHERST Annual Labor Report	DHERST Annual Survey	DHERST	Annually
		NPHC	NSO	10 years
Skilled workforce	Labor Statistics Annual Report		DLIR	Annually
		Labor Market Survey (LMS)	DLIR	5 years
	DHERST Annual Labor Report	DHERST Annual Survey	DHERST	Annually
		NPHC, HIES	NSO	10 years

b. Regional

The Pacific Education Development Framework 2009-2015 (PEDF): Monitoring and Evaluation Framework

Sub-Sector 1: Early Childhood Care and Education (ECCE)
1. Net Enrolment Ratio
2. Gross Enrolment Ratio
3. Student/Teacher Ratio
4. Number (%) ECCE Centres which meet National Minimum Quality Standards
5. Implementation of quality ECCE curriculum
6. Existence of National ECCE Policy and Planning Framework
7. EMIS inclusive of ECCE data

Sub-Sector 2: Formal Education
8. Net enrolment ratio (NER)
9. Gross enrolment ratio (GER)
10. Percentage new entrance to 1st year primary with ecce experience
11. Repetition rate (RR)
12. Drop-out rate (DR)
13. Promotion rate (PR)
14. Transition rate (primary/secondary)
15. Percentage schools with effective access to IT.
16. Percentage out-of-school children returning to formal schooling
17. Literacy rate
18. Numeracy rate.
19. Student teacher ratio (STR).
20. Student classroom ratio (SCR).
21. Student Computer ratio (SComR)
22. Percentage schools with clean water and sanitation.
23. Percentage school leavers leaving with at least a national or regional qualification
24. Frequency of curriculum review
25. Compulsory education policy developed and implemented.
26. Language policy developed.

Sub-Sector 3: Technical vocational education and training (TVET)

27. Gross enrolment ratio in TVET programs (VGER) – ISCED2
28. Percentage TVET training providers registered with National Accreditation Authority
29. Percentage TVET courses professionally assessed/validated by NAA or IAA).
30. Number of courses supported by strong industry links or partnerships through sponsorship or guarantee of employment.
31. Number of TVET courses that are competency-based (work-based skills).
32. Number of graduates with national TVET qualifications.
33. Number of TVET graduates who are gainfully employed.
34. Number of industry stakeholders/employers engaged in development of policies for skills development.

Sub-sector 4: Non-formal Education (NFE)

35. Adult literacy rate (ALR).
36. Participation Rate in NFE
37. Participants/instructor ratio
38. Existence of NFE policy.
39. Percentage of NFE providers promoting gender equality.
40. Number of NGOs delivering NFE programs.
41. Existence of pathways between formal, non-formal and informal education.

Sub-sector 5: Teacher development

42. Percentage of Qualified/Untrained teachers as per national minimum standards
43. Existence of beginning teacher induction/mentoring programs in relation to teacher professional standards.
44. Percentage teachers/school principals that undertook targeted professional development within the past 2 years.
45. Percentage teachers assessed as requiring additional advice or guidance under the teacher performance management system.
46. Percentage teachers teaching outside areas or levels of curriculum specialization
47. Percentage teaching positions filled by staff from outside the country.
48. Percentage teaching positions unfilled by end o term 1.
49. Percentage teachers leaving the profession prior to retirement age.
50. Percentage ECCE teachers under government employment.
51. Teacher training curriculum that includes mandatory course on Disability-Inclusive Education.

Sub-Sector 6: System Governance and Administration.

52. Existence of mid-term strategy to ensure achievement of sector plans.
53. Percentage policy and planning staff involved in ongoing training and professional development
54. Clear outline of obligations by donors/executing agencies in line with individual arrangements and international declarations.
55. Percentage national budget (development and recurrent) allocated to education sector.
56. Percentage wealth of a country (GDP or GNI) allocated to education (per capita).
57. Existence of EMIS that is able to support evidence-based decision making and planning for improvement of education systems.
58. Percentage of qualified and trained personnel to operate and support EMIS.
59. PEDF M&E framework aligned with national M&E system.
60. National annual education statistics report published and disseminated.
61. Existence of communication strategy and agreements with other agencies to support education outcomes.
62. Reduction in irregularities to assure transparency and accountability.

c. International

UNESCO (UIS) Survey of Formal Education

Each year the UNESCO Institute for Statistics (UIS) runs a Survey of Formal Education to provide internationally comparable data on key aspects of education systems, such as access, participation, progression and completion, as well as the associated human and financial resources dedicated to them. The survey collects information on formal education programmes only classified by level of education as defined in the ISCED 2011 revision. The following questionnaires comprise the Survey of Formal Education: UIS/E/A on students and teachers (ISCED 0-4); UIS/E/B on educational expenditure; and UIS/E/C on students and teachers (ISCED 5-8).

ISCED 0-4

A2: Number of students by level of education, intensity of participation, type of institution and sex

A3: Number of students by level of education, age and sex

A4: Number of students in formal adult education by level of education, age and sex

A5: Number of students and repeaters in initial primary education by age, grade and sex

A6: Number of students and repeaters in initial lower and upper secondary general education by grade, age and sex

A7: Number of new entrants to Grade 1 in initial education and prior enrolment by age and sex

A8: Number of graduates by level of education, type of completion and sex

A9: Number of classroom teachers by teaching level of education, employment status, type of institution and sex

A10: Number of classroom teachers by qualified and trained status, teaching level of education, type of institution and sex

Educational expenditure

B2: Educational expenditure by level of education, source and destination in instructional and non-instructional institutions

B3: Education expenditure by level of education, type of institution and nature in instructional and non-instructional institutions

ISCED 5-8

C2: Number of students by level of education, intensity of participation, type of institution and sex

C3: Number of students by level of education, field and sex

C4: Number of new entrants and first-time new entrants by level of education and sex

C5: Number of students and first-time new entrants to tertiary education by age and sex

C6: Number of internationally mobile students in tertiary education by country of origin and sex

C7: Number of graduates by level of education, field and sex

C8: Number of academic staff by level of education, employment status, type of institution and sex

Sustainable Development Goal (SDG 4) Indicators

4.1.1. Proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex

4.2.1: Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex

4.2.2: Participation rate in organized learning (one year before the official primary entry age), by sex

4.3.1: Participation rate of youth and adults in formal and non-formal education and training in the last 12 months, by sex

4.4.1: Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill

4.5.1: Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) or all education indicators on this list that can be disaggregated

4.6.1: Percentage of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex

4.7.1: Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment

4.a.1: Proportion of schools with access to :(a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; (g) basic handwashing facilities (as per the WASH indicator definitions)

4.b.1: Volume of official development assistance flows for scholarships by sector and type of study

4.c.1: Percentage of teachers in: (a) pre-primary; (b)primary;(c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (i.e. pedagogical training) pre-service or in -service required for teaching at the relevant level in a given country

SDG 4 Thematic Indicators

4.1.2   Administration of a nationally-representative learning assessment (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end of lower secondary education

4.1.3   Gross intake ratio to the last grade (primary education, lower secondary education)

4.1.4   Completion rate (primary education, lower secondary education, upper secondary education)

4.1.5   Out-of-school rate (primary education, lower secondary education, upper secondary education)

4.1.6   Percentage of children over-age for grade (primary education, lower secondary education)

4.1.7   Number of years of (a) free and (b) compulsory primary and secondary education guaranteed in legal frameworks

4.2.2   Participation rate in organized learning (one year before the official primary entry age), by sex

4.2.3   Percentage of children under 5 years experiencing positive and stimulating home learning environments

4.2.4   Gross pre-primary enrolment ratio

4.2.5   Number of years of (a) free and (b) compulsory pre-primary education guaranteed in legal frameworks

4.3.2   Gross enrolment ratio for tertiary education

4.3.3   Participation rate in technical and vocational programmes (15- to 24-year-olds)

4.4.2   Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills

4.4.3   Youth/adult educational attainment rates by age group, economic activity status, level of education and programme orientation

4.5.2   Percentage of students in primary education whose first or home language is the language of instruction

4.5.3   Extent to which explicit formula-based policies reallocate education resources to disadvantaged populations

4.5.4   Education expenditure per student by level of education and source of funding

4.5.5   Percentage of total aid to education allocated to low-income countries

4.6.2   Youth/adult literacy rate

4.6.3   Participation rate of youth/adults in literacy programmes

4.7.2   Percentage of schools that provide life skills-based HIV and sexuality education

4.7.3   Extent to which the framework on the World Programme on Human Rights Education is implemented nationally (as per the UNGA Resolution 59/113)

4.7.4   Percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability

4.7.5   Percentage of 15-year-old students showing proficiency in knowledge of environmental science and geoscience

4.a.2   Percentage of students experiencing bullying, corporal punishment, harassment, violence, sexual discrimination and abuse

4.a.3   Number of attacks on students, personnel and institutions

4.b.2   Number of higher education scholarships awarded by beneficiary country

4.c.2   Pupil-trained teacher ratio by education level

4.c.3   Percentage of teachers qualified according to national standards by level and type of institution

4.c.4   Pupil-qualified teacher ratio by education level

4.c.5   Average teacher salary relative to other professions requiring a comparable level of qualification

4.c.6   Teacher attrition rate by education level

4.c.7   Percentage of teachers who received in-service training in the last 12 months by type of training

Production and dissemination of statistics

The latest NDOE Statistical Report is for 2013 and the following is a list of tables available:

1. Summary of Institutions and Enrolments by Institution Type and Province
2. Summary of NES Institution and Enrolments by Institution Type and Province
3. Total number of Government Agency Institutions and Enrolments by Province and Institution Type.
4. Total number of Church and Other Agency Institutions and Enrolments by Province and Institution Type.
5. Total number of Permitted/Private Institutions Enrolment by Province and Institution Type
6. Summary of Teachers by Province, Institution Type and Nationality.
7. Total number of Teachers in All NES Elementary Schools by Province, Level and Gender.
8. Number of Teaching Staff in Government Agency Elementary Schools by Province, Grade and Gender.
9. Number of Teaching Staff in All Church NES Elementary Schools by Province, Grade and Gender.
10. Total Enrolment in NES Elementary and Permitted/Private Schools by Province, Grade and Gender.
11. Enrolment of PNG Students in NES Elementary and International Schools by Province, Grade & Gender.
12. Enrolment of PNG Students in NES Elementary Schools by Province, Grade and Gender.
13. Enrolment of PNG Students in NES Government Agency Elementary Schools by Province, Grade
14. Enrolment of PNG Students in NES Church Elementary Schools by Province, Grade and Gender.
15. Enrolment of PNG Students in Permitted/Private Elementary Schools by Province, Grade and Gender.
16. Pre Primary Enrolment in International Schools by Province, Grade and Gender.
17. Total Number of Staff in NES Primary Schools by Province, Agency and Gender.
18. Number of Teaching Staff in NES Government Agency Primary Schools by Province, Grade & Gender.
19. Number of Teaching Staff in NES Church in Primary Schools by Province, Grade and Gender.
20. Enrolment of PNG Students in NES Primary Schools by Province, Grade and Gender.
21. Enrolment of PNG Students in NES and International Primary Schools by Province, Grade and Gender.
22. Total Enrolment in NES and International Primary Schools by Province, Grade and Gender.
23. Enrolment of PNG Students in NES Government Agency Primary Schools by Province, Grade &Gender.
24. Enrolment of PNG Students in NES Church Agency Primary Schools by Province, Grade and Gender.
25. Enrolment of PNG Students in NES Other Agency Primary Schools by Province, Grade and Gender.
26. Enrolment in All International Primary Schools by Province, Grade and Gender.
27. Enrolment in Permitted and Private Primary Schools by Province, Grade and Gender
28. Enrolment of PNG Students in International Primary Schools by Province, Grade and Gender.
29. Enrolment of Non-PNG Students in International Primary Schools by Province, Grade and Agency.
30. Staffing in NES Provincial High and Secondary Schools by Province, Agency, Nationality and Gender.
31. PNG Teachers in Church and Other Agency in Provincial and Secondary Schools by Province, Agency
32. Total Students enrolled in Provincial, Secondary, National, International Schools by Province, Grade
33. PNG Students enrolled in all Provincial, National and International Schools by Province, Grade&Gender.
34. PNG Students enrolled in NES Provincial and Secondary Schools by Province, Grade and Gender.
35. Enrolment in Government Agency in Provincial and Secondary Schools by Province, Grade and Gender.
36. Enrolment in Church and Other Agency in Provincial & Secondary Schools by Province, Grade Gender.
37. Enrolment in Permitted Secondary Schools by Province, Grade and Gender.
38. Enrolment in IEA Secondary Schools by Province, Grade and Gender.
39. Staffing in National High Schools by Province, Institution, Nationality and Gender.
40. Enrolment in National High Schools by Province, Institution and Gender.
41. Staffing in All Vocational Centres by Province, Agency, Category and Gender.
42. PNG Teachers in Church and Other Vocational Centres by Province, Agency and Gender.
43. Enrolment in All Vocational Centres by Province, Year and Gender.
44. Enrolment in Government Agency Vocational Centres by Province, Year and Gender.
45. Enrolment in All Church Agency Vocational Centres by Province, Year and Gender.
46. Enrolment in Other Agency Vocational Centres by Province, Year and Gender.
47. Total Full Time Staff in Technical and Business Colleges by College, Nationality and Gender.
48. Total Enrolment in Technical Colleges by College, Type of Programmes and Gender.
49. Full Time PETT (Pre Employment Technical Training) enrolment in Technical College by Course
50. Technical Training Certificate (TTC) enrolment in Technical Colleges by Year, Trade and Gender.
51. Extension (Apprenticeships) Course Enrolment in Technical Colleges by College, Trade and Gender.
52. National Certificate (NC) Enrolments in Technical/Business Colleges by, College, Course and Gender.

53. Diploma Course Enrolment in Technical & Business Colleges by College, Stage, Semester, Trade
54. Part Time Enrolment in Technical Colleges by College, Course and Gender.
55. Staffing in All Primary Teachers' Colleges and University of Goroka by College, Agency, Category
56. Enrolment in All Primary Teachers Colleges by Province, College, Agency, Year and Gender.
57. Enrolment in the University of Goroka by type of course, Year and Gender.
58. Total students Enrolled in Flexible Open Distance Education by Province, Study Centre and Gender
59. Total students Enrolled in Flexible Open Distance Education by Province, Level and Gender
60. Total Enrolment in Flexible Open Distance Education By Province, Subject and Gender, Grades 7 – 10
61. Total Students Enrolled in Flexible Open Distance Education by Province, Level and Gender.
62. Total Students Enrolled in Special Education Resource Centres by Province, Age and Gender.

The latest DHERST Statistical Report is for 2015 and the following is a list of tables available:

1. Table 1 Summary Of Enrolments By Institutional Types, Institutions, Mode Of Study And Gender
2. Table 2 Summary Of Full Time Enrolments By Home Province, Institutional Type And Gender
3. Table 2.1 Full-Time Enrolments By Home Province, Universities And Gender
4. Table 2.2 Primary Teachers' Colleges Full-Time Enrolments By Home Province And Gender
5. Table 2.3 Technical Colleges Full-Time Enrolments By Home Province And Gender
6. Table 2.4 Business Colleges Full-Time Enrolments By Home Province And Gender
7. Table 2.5 Nursing Colleges Full-Time Enrolments By Home Province And Gender
8. Table 2.6 Miscellaneous Colleges Full-Time Enrolments By Home Province And Gender
9. Table 3 Summary Of Enrolment By Institutional Type, Sponsorship Type And Gender
10. Table 4 Summary Of Full Time Enrolments By Institutional Type, Marital Status, Age Group & Gender
11. Table 4.1 Full-Time Enrolments By Universities, Marital Status, Age Group And Gender
12. Table 4.2 Primary Teachers' Colleges Full-Time Enrolments By Marital Status, Age Group And Gender
13. Table 4.3 Technical Colleges Full-Time Enrolments By Marital Status, Age Group And Gender
14. Table 4.4 Business Colleges Full-Time Enrolments By Marital Status, Age Group And Gender
15. Table 4.5 Nursing Colleges Full-Time Enrolments By Marital Status, Age Group And Gender
16. Table 4.6 Miscellaneous Colleges Full-Time Enrolments By Marital Status, Age Group And Gender
17. Table 5.1 University Of Papua New Guinea Enrolments By Program, Mode Of Study And Gender
18. Table 5.2 University Of Technology Enrolments By Program, Mode Of Study And Gender
19. Table 5.3 Divine Word University Enrolments By Program, Mode Of Study And Gender
20. Table 5.4 University Of Goroka Enrolments By Program, Mode Of Study And Gender
21. Table 5.5 Pacific Adventist University Enrolments By Program, Mode Of Study And Gender
22. Table 5.6 University Of Natural Resources & Environment Enrolments By Program, Mode Of Study
23. Table 5.7 Summary Of Primary Teachers Colleges Enrolment By Program, Mode Of Study And Gender
24. Table 5.8 Summary Of Nursing Colleges Enrolment By Program, Mode Of Study And Gender
25. Table 5.9 Summary Of Technical Colleges Enrolments By Program, Mode Of Study And Gender
26. Table 5.10 Summary Of Business Colleges Enrolments By Program, Mode Of Study And Gender
27. Table 5.11 Summary Of Miscellaneous Colleges Enrolments By Program, Mode Of Study And Gender
28. Table 6.1 University Of Papua New Guinea Total Enrolments By Program, Sponsorship Type & Gender
29. Table 6.2 University Of Technology Total Enrolments By Program, Sponsorship Type And Gender
30. Table 6.3 Divine Word University Total Enrolments By Program, Sponsorship Type And Gender
31. Table 6.4 University Of Goroka Total Enrolments By Program, Sponsorship Type And Gender
32. Table 6.5 Pacific Adventist University Total Enrolments By Program, Sponsorship Type And Gender
33. Table 6.6 University Of Natural Resources And Environment Total Enrolments By Program
34. Table 6.7 Primary Teachers Colleges Total Enrolments By Program, Sponsorship Type And Gender
35. Table 6.8 Nursing Colleges Total Enrolments By Program, Sponsorship Type And Gender
36. Table 6.9 Technical Colleges Total Enrolments By Program, Sponsorship Type And Gender
37. Table 6.10 Business Colleges Total Enrolments By Program, Sponsorship Type And Gender
38. Table 6.11 Miscellaneous Institutions Total Enrolments By Program, Sponsorship Type And Gender
39. Table 7.0 Summary Of Staffing By Institutional Type, Staff Type, Nationality And Gender
40. Table 7.1 Teaching Staff Full-Time And Part-Time Teaching Hours
41. Table 7.2 Summary Of Staffing By Institution, Staff Type, Nationality And Gender
42. Table 8 Summary Of Graduates By Institutional Types, Mode Of Study And Gender

Methodological annex: DQA Principles

UNESCO Institute of Statistics Code of Practice for Ministries of education in charge of statistics produced and disseminated through administrative routine data systems

Credible education statistics are vital since they are essential to the design, formulation, monitoring and assessment of education plans and programmes.

This credibility is a value that gains strength over time thanks to the generation of quality statistics that comply with standards, principles and norms relating to the production process and statistical activity as a whole.

Education statistics are made of information and data of different types gathered from different data sources (administrative data, assessment data, household surveys, and population census). At country level, Ministries of education are in general the main body in charge of statistics produced from administrative routine systems (commonly referred as "EMIS").

The UIS Code of Practice (CoP) for Ministries of education aims to ensure that these statistics produced from administrative data are not only relevant, timely and accurate but also comply with principles of professional independence, impartiality and objectivity.

The CoP is constituted of 8 principles covering the institutional environment, the statistical production processes and the statistical outputs. A set of indicators of good practice for each of the Principles provides a reference for reviewing the implementation of the Code. It is based on the Ed-DQAF which provides guidance and evidence for the implementation of the indicators.

The Cop is a technical instrument containing practical rules for ensuring the credibility of statistics produced and disseminated by MoE at the national level. It is intended to serve as a guide for improving the quality of statistics produced at global level, to improve the quality of official statistics and build trust in users by encouraging the application of best international methods and practices in statistical production and dissemination from administrative routine data systems.

Institutional Environment

Institutional and organisational factors have a significant influence on the effectiveness and creditability of Ministries of education developing, producing and disseminating education Statistics. The relevant aspects are Policy and legal framework, Adequacy of resources, Quality awareness, Professionalism, Transparency and Ethical standards

Principle 1: Policy and legal framework

Legal and institutional environment governing education statistics have a significant influence on the effectiveness and credibility of a Ministry of Education to produce and disseminate education statistics.

Indicators:

1.1: The responsibility for collecting, processing, and disseminating statistics is clearly specified.

1.2: Respondents' data are to be kept confidential and used for statistical purposes only

Principle 2: Adequacy of resources

The Ministry of Education ensures that resources are commensurate with the statistical programmes, personnel, facilities, equipment, technology, training and financing of their education management information systems.

Indicators:

2.1: Staff and their qualification are commensurate with EMIS functions and policies for retention are in place

2.2: Computing resources and physical facilities are commensurate with statistical programs

2.3: Financial resources are commensurate with statistical programs

Principle 3: Relevance

Education Statistics meet the needs of users.

Indicators:

3.1: Consultations with data's users are done periodically.

3.2: User satisfaction is monitored on a regular basis and is systematically followed up.

Statistical Processes

International standards, guidelines and good practices are fully observed in the processes used by the Ministries to organise, collect, process and disseminate official Statistics. The credibility of the statistics is enhanced by a reputation for good management and efficiency. The relevant aspects are Methodological soundness.

Principle 4: Sound Methodology

The methodological basis for the education statistics follows internationally accepted standards, guidelines, or good practices.

Indicators:

4.1: Concepts and definitions used are in accord with standard statistical frameworks.

4.2: The scope is in accord with internationally accepted standards, guidelines, or good practices.

4.3: Classification systems are in accord with national and internationally accepted standards, guidelines, or good practices.

4.4: Archiving of source data and statistical results based on sound database principles.

Principle 5: Accuracy and reliability

Data sources and statistical techniques are sound and education statistical outputs sufficiently portray reality.

Indicators:

5.1: Available data sources provide an adequate basis to compile statistics.

5.2: Data sources are regularly assessed and validated.

5.3: Statistical techniques employed conform to sound statistical procedures, and are documented.

Statistical Outputs

Available statistics meet users' needs. Education statistics comply with the international quality standards and serve the needs of international institutions, governments, research institutions, business concerns and the public generally. The important issues concern Relevance, Periodicity and timeliness, Consistency and Accessibility and clarity.

Principle 6: Periodicity and timeliness

Education statistics are released following internationally accepted periodicity and in a timely manner.

Indicators:
6.1: Periodicity and timeliness follow dissemination standards.

Principle 7: Consistency

Released education statistics are consistent within a dataset and over time, and with other major datasets.

Indicators:
7.1: Final statistics are consistent within a dataset.

7.2: Final statistics are consistent or reconcilable over a reasonable period of time.

7.3: Final statistics are consistent or reconcilable with those obtained through other surveys and data sources.

Principle 8: Accessibility and clarity

Education statistics and metadata are easily available in a clear and understandable manner, and there is adequate user support.

Indicators:
8.1: Statistics are presented in a clear and understandable manner, forms of dissemination are adequate.

8.2: Up-to-date and pertinent metadata are made available.

8.3: Prompt and knowledgeable assistance support service to users is available.

List of Person Interviewed

Mr Titus Hatagen	Deputy Secretary, Department of Education
Mr James Agigo	Assistant Secretary (Research, Evaluation and Statistics, Department of Education
Ms Priscilla Rasehei	Director of Statistics, Department of Education
Mr Wesley Lakani	Secretary General, National Commission for UNESCO
Ms Nicola Simpson (+DFAT colleagues)	Department of Foreign Affairs and Trade Australia High Commission
Ms Maria-Louise Wau. Ms Rosemary Matawai	Assistant Secretary/Senior Analyst, Department of National Planning and Monitoring
Mr Roko Koloma	National Statistician National Statistical Office
Ms Ancilla Yendi	Manager, Statistics & Data Management, Dept. of Higher Education, Research, Science & Technology
Mr Gideon Kaevakore	Manager, Policy & Strategic Planning, Department of Higher Education, Research, Science and Technology
Mr David Towers	EMIS Adviser, Department of Higher Education, Research, Science and Technology
Mr Sylvester O'oru	Assistant Secretary, Community Learning Department of Community Development
Mr Oscar Onam	EMIS Advisor, Statistics Division Department of Education
Mr Kam Khademazad	ICT Adviser, IT Division Department of Education
Ms Sabati Mero Mr John Dau	Planning Division Department of Education
	TVET Curriculum Division Department of Education
Ms Negliyn Lunga	Measurement Services Division Department of Education
	Finance and Budget Division Department of Education
Mr Boio Naime	General Education Services Department of Education
Ms Dorcas Mugga	Research Director, Research and Evaluation Divsion Department of Education
Mr Rotina Girana	Head teacher, Hohola Demonstration Primary School Port Moresby

Ms Florence Bouraga Mr Joe Kauri	National Training Council
Mr Arthur Geno	Assistant Director, National Apprenticeship and Trade Testing Board
Mr Gideon Kaevakore (+ DHERST staff)	Manager, Policy and Strategic Planning, Dept. of Higher Education, Research, Science & Technology
Mr Hemansu Roy Trivedy (+ UNCT members)	Resident Coordinator UN Country Team, Papua New Guinea
Ms Ruby Noble	Chief Education UNICEF, Papua New Guinea
Mr Koffi Kouame	Representative UNFPA, Papua New Guinea
Mr Orlando Antonio	Planner, NCD Provincial Education Division
	Deputy Principal, Gordons Secondary School

FINAL DRAFT

List of Team Members

National Team Members

Mr James Agigo (Team Leader)	Assistant Secretary (Research, Evaluation and Statistics, Department of Education
Mr Peter Kants	First Assistant Secretary, Department of Education.
Ms Priscilla Rasehei	Director of Statistics, Department of Education
Mr Wesley Lakani	Secretary General, National Commission for UNESCO
Mr Terry Pato	Director for Information and Communication, UNESCO, Department of Education.
Mr Jaime Peninsa	Senior Data Analyst, Department of Education.
Mr Joe Dau	Regional Strategic Planner, Department of Education.
Mr Orlando Antonio	Planner, NCD Provincial Education Division
Ms Rosemary Matawai	Senior Analyst, Department of National Planning and Monitoring
Ms Ancilla Yendi	Manager, Statistics & Data Management, Department of Higher Education, Research, Science & Technology
Mr Sylvester O'oru	Assistant Secretary, Community Learning Department of Community Development
Mr Oscar Onam	EMIS Advisor, DFAT Education Cooperation Development Facility

Mission Team members

Mr Gregory Keeble	UIS Statistical Cluster Adviser, UNESCO Office for Pacific States
Mr. Bertrand Tchatchoua	UIS Programme Specialist, UNESCO Institute for Statistics, Montreal
Mr. Michael Noa	SPC Monitoring and Evaluation Adviser, Education Quality and Assessment Programme, Suva
Ms Grace Heaoa	Program Manager - Education Australian High Commission, Port Moresby

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