

DRAFT

Core skills framework for ICT Statisticians of NSOs in developing countries

General principles used in preparing the framework

1. The primary reason for developing this framework is to identify what skills SIAP should provide training for. The framework could be also used to identify which additional skills staff of NSO and other agencies involved in the production of official statistics are needed to improve their organizational performance. The framework can be also used by Staff members to manage their own professional development and identify what skills they need to improve their job performance.
2. There are 5 different levels used in the framework which is designed to cover the work of most of the statistical staff in the NSO and other government agencies. Additional levels could be introduced to cover senior management staff.
3. The levels covered in the framework are:
 1. Clerical support (not fully developed as this positions are not thought to come within the scope of training)
 2. Core Skills Level 2
 3. Core Skills Level 3
 4. Core Skills Level 4
 5. Core Skills Level 5
4. Prerequisites – advancement between levels assumes that the skills developed will be carried forward to the next level.
5. The framework encompasses the key points of the strategic objectives established by the Institute.
6. The Institute has been given priority areas where development is needed: MDG and sustainable indicators, SNA implementation and Information management and related ICT. In preparing this framework, it became clear that these areas could not be addressed in isolation. They depend upon a sound skill set in a wide range of statistical areas. The skills needed for them are quite narrow and only needed by a few people who are specialists in each area. By definition, these people will be experienced statisticians who have the ability to become experts and have the ability to lead.

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TITLE – LEVEL 2	TITLE – LEVEL 3	TITLE – LEVEL 4	TITLE – LEVEL 5
BRIEF DESCRIPTION OF ROLE			
<ul style="list-style-type: none"> – Understanding the collection & capture , editing and compiling of data, – Preparing data, and tables for publication, – Dealing with routine requests for statistical information. 	<ul style="list-style-type: none"> – Assisting in the development of ICT processes, procedures, methodologies & systems relevant to a work area, including the preparation of documentation. – Undertaking the ICT operational and technical aspects of processing information and data analysis relevant to a work area. – Understanding the ICT requirements of users of data from the work area and where applicable, liaise, communicate & provide assistance. – Researching conceptual & methodological issues – Recommending and implementing improvements in ICT aspects of statistical production and compilation. 	<p>A self managed employee who is:</p> <ul style="list-style-type: none"> – Beginning to develop leadership skills: think strategically & solve ICT problems. – Can apply their ICT skills & knowledge across several related work areas & apply it to all phases of the statistical process. - Has a good understanding of the ICT implications of relevant conceptual and statistical frameworks & is able to help others with understanding these. - - Communicates research reports, statistical output and concepts related to ICT use to a wide audience (e.g. statisticians, policy makers, media, the general public) 	<p>Undertakes a range of roles focused on managing the achievement of outputs, especially on the ICT requirements. These outputs vary from large development projects, to producing regular statistics.</p>
PRE-REQUISITES			
Should feel comfortable using numbers and codes, and familiar with basic programming techniques	Proven competence and at least 4 years experience at level 2 or a 2 year university exposure in any of the following disciplines: mathematics, statistics, economics, accountancy, computer science, geography, demography, or other social sciences.	Proven competence & at least 3 years experience at level 3.	Proven competence and at least 3 years experience at level 4 and strong leadership and communications attributes.

	All appointees to level 3 should have the potential to progress to level 4		
CORE STATISTICAL SKILLS			
1.1 General statistical knowledge			CORE STATISTICAL SKILLS
			<i>Nothing additional to level 4</i>
<p>1. Can explain respondent burden, confidentiality, & the core values of official statistics as defined by the United Nations and the NSO.</p> <p>2. Can describe key indicators produced by the NSO.</p> <p>3. Can describe the principles behind the legislation their NSO operates under.</p>	<p>1. Can explain how their work contributes to the overall goals of the NSO.</p> <p>2. Can explain the statistical measures they use.</p> <p>3. Can explain the ICT issues involved in data production</p> <p>4. Can explain what standards are & why they are important to the NSO's work.</p> <p>5. Can explain what kind of metadata the NSO should have & why is it important.</p> <p>6. Can explain why measures of quality are important</p> <p>.7. Has a working knowledge of frameworks that directly affect their area of work.</p>	<p>1. Is able to make linkages between & within economic, social and environmental statistics.</p> <p>2. Has a basic understanding of relevant conceptual frameworks (labour market, National accounts, BOP etc).</p> <p>3. Is able to identify areas for ICT improvement, determine the impact of, & make recommendations for changes based on quality assurance, standards, values and information management principles.</p>	
1.2 Analytical skill and knowledge			
<p>1. Be able to understand appropriate test formulas and perform standard calculations, data manipulation, queries & exploratory data analysis (group data, gather frequency counts, display and interpret outliers) within established procedural guidelines.</p>	<p>1. Can explain to non statisticians how the statistics from their work area are being produced and who they are used by.</p> <p>2. Is able to carry out data manipulation, queries and exploratory data analysis (group data, gather frequency counts, display and interpret outliers) using appropriate analytical tools.</p>	<p>1. Is proficient at using advanced analysis tools,</p> <p>2. Is able to undertake advanced querying (e.g. regression, modeling techniques, multi-variate analysis etc).</p> <p>3. Understands the linkages, & interdependencies between all phases of the statistical process.</p> <p>4. perform complicated computations independently on research problems</p>	

1.3 Need and feasibility phase of the statistical process			
<p>1. Can explain why the statistics they work on is produced and who the statistics are produced for.</p>	<p>1. Is able to liaise with key users to establish need. 2. Is able to determine research questions, with guidance, & how to formulate them into statistical measures. 3. Is able to identify what data is already available and advise on how gaps can be filled. 4. Is able to participate in meetings with departmental representatives for the purpose of modifying codes, designing and changing forms</p>	<p>1. Is able to determine if a project is feasible after doing the required research, thinking and independent consultation with department representatives and principal investigators, 2. Is able to assess what are ICT requirements to achieve desired outputs by helping in the planning and implementation of major projects; 3. Is able to make job cost estimates on statistical analyses which require consultation with principal investigators; 4. Is able to mentor level 3 staff in gaining these skills.</p>	
1.4 Develop and design phase of the statistical process			
<p>Can explain the key features of the systems used to produce the statistics they work on.</p>	<p>1. Can explain how the systems used to produce the statistics they work on were designed and developed. 2. Has a working knowledge of population definition, sample methodologies, collection instruments & statistical processing methodology. 3. Can set up specifications for computer programming problems as required, as well as develop data screening programs for computer application</p>	<p>1. Has a working knowledge of questionnaire design (e.g. question structure, wording, sequencing of questions etc) 2. Has a working knowledge of complex survey designs 3. Can identify the skills required to meet project outputs. 4. Can examine survey results and census data for their validity, with a view to improve accuracy of estimates by making adjustments for response and non-response errors:</p>	

		<ul style="list-style-type: none"> i. enterprise/establishment survey and economic census ii. data available from business registers and other administrative records / business sources for compilation <p>5. Can recommend specific revisions in statistical codes, in consultation with subject-matter specialists;</p> <p>6. Can try out new statistical tests which are adaptations of accepted theories and/or principles of inference.</p> <p>7. Is able to make recommendations from discussions the purposes and objectives of various studies, the previous research done on problems, the scope, methods of approach to problems, and the restrictions inherent in experiments.</p>	
1.5 Collect and process phases of the statistical process			
<ul style="list-style-type: none"> 1. Can explain the differences between a census, a survey and administrative data. 2. Can explain the collection methods used for the statistics they work on will influence the final results 3. Can handle and supervise operations for enumeration and collection in the field 4. perform routine statistical 	<ul style="list-style-type: none"> 1. Has a working knowledge of sampling principles (e.g. populations, sampling frames, representative samples, sampling error and non sampling errors) 2. Has a working knowledge of setting up and running administrative collections, including monitoring reports. 3. Has a working knowledge of the effects of the collection mode on response rates and data quality. 4. Can explain the stages of data processing 	<ul style="list-style-type: none"> 1. Is able to generate and validate a sample 2. Is able to evaluate response burden and compliance cost. 3. Is able to develop procedures to impute missing data, and calculate, and apply weights to datasets 4. Has working knowledge of data integration techniques 5. Can make progress reports during selected long-term projects; 	

<p>computations such as multiple and partial Correlation coefficients, t-tests, Chi-square and one-way analysis of variance;</p> <p>5. perform complex computations when formulas are set up and when specific instructions are given in their use;</p> <p>6. Is able to code raw data and design simple codes for machine processing; recode data combining and modifying categories.</p>	<p>and how data is transformed to meet output objectives.</p> <p>5. Has a working knowledge of the principles and practices of coding, classification data integration, editing, imputation and estimation.</p> <p>6. Is able to define and produce basic derivations.</p> <p>7. instruct lower level statisticians and related clerical personnel on the techniques of coding, statistical computations and utilization of equipment</p> <p>3. Prepare controls to adopt particular computer programs for selected research problems</p>	<p>6. Is responsible for the processing of pre-coded data and the preparation of related reports</p> <p>7. Can select or write appropriate computer programs as necessary.</p>	
<p>1.6 Analysis and disseminate phase of the statistical process</p>			
<p>1. Has a working knowledge of methods used to describe data (e.g. simple graphs, averages, percentage changes)</p> <p>2. Can plot curves from computer output and prepare final graphs for reports.</p> <p>3. Can describe and help prepare materials for the different channels used by the NSO to disseminate data (e.g. press releases, web sites, statistical publications.) and the reasons why channel is used.</p>	<p>1 Is able to obtain and manipulate data and identify data issues.</p> <p>2. Is able to produce statistics and seasonally adjusted data.</p> <p>3. Is able to check the quality of statistics (e.g. response rates, detect and interpret outliers, calculate and interpret measures of dispersion, macro edit.)</p> <p>4. Is able to describe statistical information to experienced users of statistics</p> <p>5. Is able to interpret, design visual presentation content to explain statistics (e.g. time series, indices)</p> <p>6. Is able to access statistics prior to release for conformity with confidentiality rules and fit for use.</p> <p>7. Has a working knowledge of data repositories, releases, and dissemination</p>	<p>1. Is able to meet with investigators to discuss possible statistical analyses of their research data</p> <p>2. Is able to prepare statistics for dissemination in coordination with subject-matter statisticians</p> <p>3. Is able to identify, justify, and develop process/systems/output improvement</p> <p>4. Is able to interpret results to investigators after completion of staff analysis;</p>	

	channels.		
Statistical Management skills			STATISTICAL MANAGEMENT SKILLS
<i>None required at level 2</i>	<i>None required at level 3</i>	<i>None required at level 4 but should be exposed to informal learning opportunities and encouraged to seek mentors at level 5 and other above.</i>	2.1 Delivering agreed outputs
			<p>1. Is able to manage the production of agreed deliverables in a work area to required timeframes, to standards, and within budget.</p> <p>2. Is able to review and improve the processes by which deliverables are produced.</p> <p>3. Is able to apply the NSO's policies in their work area.</p> <p>4. Is able to produce and communicate performance indicators for their work area (e.g. quality, accuracy, timeliness, accessibility)</p>
			2.2 Team leadership
			<p>1. Is able to create a productive team culture.</p> <p>2. Is able to develop project plans and expectation/goal statements that influence the work of the team.</p> <p>3. Is able to identify the skills required to meet project deliverables and arrange for these skills can be obtained.</p> <p>4. Is able to coach team members from levels 2-4.</p>
			2.3 Management of risk
			Is able to develop risk management plans and ensure these influence the way their team works
			2.4 Build productive relationships

			<p>1. Can build and maintain, productive relationships, with users of the deliverables their team produces to ensure they are relevant, accurate, timely and properly used.</p> <p>2. Has an established network of peers outside the NSO to enable the interchange of new information and practices.</p>
			<p>2.5 Contribute to the management of NSO</p> <p>1. Is able to contribute expertise and ideas to improve decision making.</p> <p>2. Is able to demonstrate consistent leadership behaviors that support the NSO's desired culture.</p> <p>3. Is able to contribute to initiatives to be used across the organization.</p>
Specialist skills in to meet priority areas			
<i>None required at level 2</i>	<i>The skills listed in this section (3.1-3.3) are additional to those included in 1.1-1.6 above</i>		<i>The skills listed in Level 5 are additional to those included in section 1.1 -.1.6 at Level 4. They are required for those people working directly in the areas concerned.</i>
	3.1 Key Indicators [MDGs and sustainable development]		
	Can explain the statistical measures and how they are used.	1. Is able to understand statistical and ICT requirements and help develop proposals to implement a new measure/indicator.	<p>1. Is able to provide the ICT foundation for the development, preparation and interpretation of key indicators such as the MDG and sustainable development.</p> <p>2. Is able to produce and present technical papers on the NSO's production of MDGs and sustainable development indicators.</p>

	3.2 Projections		
	Can explain the statistical measures and how they are produced.	Will have the skills to be recognised as a resource person in the ICT aspects of projections.	<i>Nothing additional to level 4</i>
	3.3 Research methods and data modeling		
	Can explain the statistical measures and how they are produced.	Will have the skills to be recognised as a resource person in the ICT aspects of methods and modeling.	<i>Nothing additional to level 4</i>