

# Core skills framework for Macro Economics 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.

## Core skills framework for SNA Statisticians of NSOs in developing countries

TITLE – LEVEL 2	TITLE – LEVEL 3	TITLE – LEVEL 4	TITLE – LEVEL 5
<b>BRIEF DESCRIPTION OF ROLE</b>			
<ul style="list-style-type: none"> <li>– Arranging the collection &amp; capture , editing and compiling of data,</li> <li>– Preparing data, and tables/accounts for publication,</li> <li>– Answering questions from respondents,</li> <li>– Dealing with routine requests for statistical information.</li> </ul>	<ul style="list-style-type: none"> <li>– Contributing to the development of processes, procedures, methodologies &amp; systems relevant to a work area, including the preparation of documentation.</li> <li>– Undertaking the operational and technical aspects of processing information and data analysis relevant to a work area.</li> <li>– Understanding the requirements of all users of data from the work area and where applicable, liaise, communicate &amp; provide assistance.</li> <li>– Researching conceptual &amp; methodological issues</li> <li>– Recommending implementing improvements.</li> </ul>	<p>A self managed employee who is:</p> <ul style="list-style-type: none"> <li>– Beginning to develop leadership skills: think strategically &amp; solve problems.</li> <li>– Can apply their skills &amp; knowledge across several related work areas &amp; apply it to all phases of the statistical process.</li> <li>- Has a good understanding of conceptual and statistical frameworks &amp; is able to help others with their understanding of them. - -</li> <li>- Communicates research reports, statistical output and concepts to a wide range of statistical literacy (e.g. statisticians, policy makers, media, the general public)</li> </ul>	<p>Undertakes a range of roles focused on managing the achievement of outputs. These outputs vary from large development projects, to producing regular statistics.</p>
<b>PRE-REQUISITES</b>			
<p>Should feel comfortable using numbers, and familiar with accounting</p>	<p>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. All appointees to level 3 should have the</p>	<p>Proven competence &amp; at least 3 years experience at level 3.</p>	<p>Proven competence and at least 3 years experience at level 4 and strong leadership and communications attributes.</p>

	potential to progress to level 4 (Senior Analyst).		
<b>CORE STATISTICAL SKILLS</b>			
<b>1.1 General statistical knowledge</b>			<b>CORE STATISTICAL SKILLS</b>
			<i>Nothing additional to level 4</i>
<p>1. Can explain respondent burden, confidentiality, &amp; 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 &amp; other official statistics producers in their country.</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 what standards are &amp; why they are important to the NSO's work.</p> <p>4. Can explain what kind of metadata the NSO should have &amp; why is it important.</p> <p>5. Can explain why measures of quality are important</p> <p>6. Can explain the respondent burden issues that influence survey design.</p> <p>7. Can describe all the key economic, social and environmental frameworks and has a working knowledge of frameworks that directly affect their area of work.</p>	<p>1. Is able to make linkages between &amp; within economic, social and environmental statistics.</p> <p>2. Has a thorough understanding of relevant conceptual frameworks (labour market, National accounts, BOP etc).</p> <p>3. Is able to identify areas for improvement, determine the impact of, &amp; make recommendations for changes based on quality assurance, standards, values and information management principles.</p>	
<b>1.2 Analytical skill and knowledge</b>			
<p>Be able to undertake:</p> <p>1. data manipulation, queries &amp; exploratory data analysis (group data, gather frequency counts, display and interpret outliers) using an appropriate analytical tool.</p>	<p>1. Can explain to non statisticians why the statistics from their work area are being produced, who they are used by, and how they use them.</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 an appropriate analytical tool.</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, &amp; interdependencies between all phases of the statistical process.</p>	

<b>1.3 Understanding of SNA Framework</b>			
<p>1. Can explain why the statistics they work on are produced.</p> <p>2. Can explain who the statistics are produced for &amp; how they will be used.</p>	<p>Has basic knowledge of the theoretical framework of National Accounting, including:</p> <ul style="list-style-type: none"> <li>(i) macro-economic basis for SNA Framework</li> <li>(ii) overview of the SNA</li> <li>(iii) institutional units</li> <li>(iv) concept of FISIM</li> <li>(v) supply &amp; use table and goods &amp; services accounts</li> <li>(vi) sequence of accounts – production accounts, income accounts, accumulation accounts and balance sheet.</li> <li>(vii) satellite accounts</li> <li>(viii) inventory valuation</li> <li>(ix) owner-occupied housing.</li> </ul>	<p>Has comprehensive knowledge of the theoretical framework of National Accounting, including:</p> <ul style="list-style-type: none"> <li>(i) macro-economic basis for SNA Framework</li> <li>(ii) overview of the SNA</li> <li>(iii) supply &amp; use table and goods &amp; services accounts</li> <li>(iv) sequence of accounts – production accounts, income accounts, accumulation accounts and balance sheet.</li> <li>(v) satellite accounts</li> <li>(vi) inventory valuation.</li> </ul>	
<b>1.4 Estimation of Current- and Constant-price GDP</b>			
<p>Be able to undertake value added (SNA) computations from set methodologies based on accounting relationships</p>	<ul style="list-style-type: none"> <li>1. Is able to liaise with key users to establish need.</li> <li>2. Is able to determine research questions, with guidance, &amp; how to formulate them into statistical measures.</li> <li>3. Is able to identify what data is already available and advise on how gaps can be filled.</li> <li>4. Is able to use and construct index numbers for national accounting.</li> <li>5. Has ability to apply different methods for compiling macro-economic aggregates at current and constant prices, including: <ul style="list-style-type: none"> <li>a. direct methods</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>1. Is able to test for feasibility and ask what is required to achieve desired outputs.</li> <li>2. Is able to mentor level 3 staff in gaining these skills.</li> <li>3. Is able to determine if a project is feasible after doing the required research, thinking and consultation.</li> <li>4. Has deep understanding of price and volume measures.</li> <li>5. Can apply 'best practices' and 'preferred techniques', for compiling macro-economic aggregates at current and constant prices,</li> </ul>	

	<ul style="list-style-type: none"> <li>b. labour input method to cover non-observed economy (including informal sector)</li> <li>c. perpetual inventory method – for estimating capital stock and consumption of fixed capital</li> <li>6. Can use methods of extrapolation, revaluation and deflation.</li> </ul>	including: <ul style="list-style-type: none"> <li>a) direct methods</li> <li>b) labour input method to cover non-observed economy (including informal sector)</li> <li>c) perpetual inventory method – for estimating capital stock and consumption of fixed capital</li> <li>6. Can assess/develop methods of extrapolation, revaluation and deflation.</li> </ul>	
<b>1.5 Uses and Techniques of Data for Compilation</b>			
Can explain the key features of the systems used to produce the statistics they work on.	<ul style="list-style-type: none"> <li>1. Can explain how the systems used to produce the statistics they work on were designed and developed.</li> <li>2. Has a working knowledge of population definition, sample methodologies, collection instruments &amp; statistical processing methodology.</li> <li>3. Has a working knowledge of workflows and transformations</li> <li>4. Can use survey and census data for compilation of national accounts:             <ul style="list-style-type: none"> <li>i. enterprise/establishment survey and economic census</li> <li>ii. data available from business registers</li> <li>iii. results of household income and expenditure survey</li> <li>iv. results of labour force survey.</li> </ul> </li> <li>5. Can use administrative records / business sources for compilation of national accounts,</li> </ul>	<ul style="list-style-type: none"> <li>1. Has a working knowledge of questionnaire design (e.g. question structure, wording, sequencing of questions etc)</li> <li>2. Has a working knowledge of complex survey designs</li> <li>3. Can identify the skills required to meet project outputs.</li> <li>4. Understands the implications of build decisions on the data which will be produced from the system</li> <li>5. Can examine survey results and census data for their validity, with a view to improve accuracy of estimates of macro-economic aggregates by making adjustments for response and non-response errors:             <ul style="list-style-type: none"> <li>i. enterprise/establishment survey and economic census</li> </ul> </li> </ul>	

	<p>including:</p> <ul style="list-style-type: none"> <li>i. analysis of business accounts</li> <li>ii. use of government financial statistics</li> <li>iii. other administrative sources like population registers, line ministries' reports, publications and other data of the central bank</li> </ul> <p>6. Has ability to apply techniques of compiling:</p> <ul style="list-style-type: none"> <li>(i) sub-national accounts</li> <li>(ii) rebased series.</li> </ul>	<ul style="list-style-type: none"> <li>ii. data available from business registers</li> <li>iii. results of household income and expenditure survey</li> <li>iv. results of labour force survey.</li> </ul> <p>6. Can use of administrative records / business sources for compilation of national accounts, including:</p> <ul style="list-style-type: none"> <li>i. analysis of business accounts</li> <li>ii. use of government financial statistics</li> <li>iii. other administrative sources like population registers, line ministries' reports</li> <li>iv. publications and other data of the central bank.</li> </ul> <p>7. Has ability to apply techniques of compiling:</p> <ul style="list-style-type: none"> <li>i. supply and use tables, Input-Output Transaction Tables and balancing techniques</li> <li>ii. quarterly accounts, with seasonal adjustment</li> </ul>	
<b>1.6 Collect and process phases of the statistical process</b>			
<p>1. Can explain the differences between a census, a survey and administrative data.</p> <p>2. Can explain the collection methods used for the statistics they work on will influence the final</p>	<p>1. Has a working knowledge of sampling principles (e.g. populations, sampling frames, representative samples, sampling error and non sampling errors)</p> <p>2. Has a working knowledge of setting up and running administrative collections,</p>	<p>1. Is able to generate and validate a sample</p> <p>2. Is able to evaluate response burden and compliance cost.</p> <p>3. Is able to develop procedures to impute missing data, and calculate,</p>	

<p>results</p> <p>3. Can handle and supervise operations for enumeration and collection in the field</p>	<p>including monitoring reports.</p> <p>3. Has a working knowledge of the effects of the collection mode on response rates and data quality.</p> <p>4. Can explain the stages of data processing 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>and apply weights to datasets</p> <p>4. Has working knowledge of data integration techniques</p>	
<p><b>1.7 Analysis phase of the statistical process</b></p>			
<p>Has a working knowledge of methods used to describe data (e.g. simple graphs, averages, percentage changes)</p>	<p>1. Is able to obtain and present background information from a wide range of sources to validate statistical data.</p> <p>2. Is able to obtain and manipulate data and identify data issues.</p> <p>3. Is able to produce statistics and seasonally adjusted data.</p> <p>4. 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>5. Is able to interpret, design visual presentation content and 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>1. Is able to prepare national accounts and source statistics for dissemination</p> <p>2. Is able to identify, justify, and develop process/systems/output improvement</p> <p>3. Is able to present national accounts, survey statistics, and research findings at external seminars</p>	
<p><b>1.8 Disseminate phase of the statistical process</b></p>			
<p>Can describe and prepare materials</p>	<p>1. Is able to describe statistical information</p>	<p>Is able to promote national accounts</p>	

<p>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>to experienced users of statistics  2. Has a working knowledge of data repositories, releases, and dissemination channels.  3. Is able to communicate the story of the statistics and relay the right message within the context.</p>	<p>and source statistics at external seminars</p>	
<p><b>Statistical Management skills</b></p>			<p><b>STATISTICAL MANAGEMENT SKILLS</b></p>
<p><i>None required at level 2</i></p>	<p><i>None required at level 3</i></p>	<p><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></p>	<p><b>2.1 Delivering agreed outputs</b></p> <ol style="list-style-type: none"> <li>1. Is able to manage the production of agreed deliverables in a work area to required timeframes, to standards, and within budget.</li> <li>2. Is able to review and improve the processes by which deliverables are produced.</li> <li>3. Is able to apply the NSO's policies in their work area.</li> <li>4. Is able to produce and communicate performance indicators for their work area (e.g. quality, accuracy, timeliness, accessibility)</li> </ol> <p><b>2.2 Team leadership</b></p> <ol style="list-style-type: none"> <li>1. Is able to create a productive team culture.</li> <li>2. Is able to develop project plans and expectation/goal statements that influence the work of the team.</li> <li>3. Is able to identify the skills required to meet project deliverables and arrange for these skills can be obtained.</li> <li>4. Is able to coach team members from levels 2-4.</li> </ol>

			<p><b>2.3 Management of risk</b></p> <p>Is able to develop risk management plans and ensure these influence the way their team works</p> <p><b>2.4 Build productive relationships</b></p> <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. 2. Has an established network of peers outside the NSO to enable the interchange of new information and practices.</p> <p><b>2.5 Contribute to the management of NSO</b></p> <p>1. Is able to contribute expertise and ideas to improve decision making. 2. Is able to demonstrate consistent leadership behaviors that support the NSO's desired culture. 3. Is able to contribute to initiatives to be used across the organisation.</p>
<b>Specialist skills in to meet priority areas</b>			
<i>None required at level 2</i>	<i>The skills listed in this section (3.1-3.3) are additional to those included in 1.1-1.8 above</i>		<i>The skills listed in section 5 are additional to those included in section 1.1 -.1.8 at Level 4. They are required for those people working directly in the areas concerned.</i>
	<b>3.1 MDG's and sustainable development</b>		

	Can explain the statistical measures and how they are used.	1. Is able to understand requirements and develop proposals to implement a new measure/indicator. 2. Is able to evaluate the strengths and weaknesses of comparable statistics produced in other countries	1. Is able to lead the development, preparation and interpretation of MDG and sustainable development indicators. 2. Is able to produce and present technical papers on their NSO's adoption of MDG's and sustainable development indicators.
	<b>3.2 Projections</b>		
	Can explain the statistical measures and how they are used.	Will have the skills to be recognised as a resource person in this area.	<i>Nothing additional to level 4</i>
	<b>3.3 Research methods and data modeling</b>		
	Can explain the statistical measures and how they are used.	Will have the skills to be recognised as a resource person in this area.	<i>Nothing additional to level 4</i>