

TERMS OF REFERENCE



CONSULTANCY TO HIRE A FIRM FOR UNDERTAKING OF NATIONAL TRAININGS ON PYTHON IN TEN (10) SADC MEMBER STATES

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1. BACKGROUND INFORMATION

1.1 Partner country

The Southern African Development Community (SADC).

1.2 Contract authority

The Contracting Authority is SADC Secretariat, represented by its Executive Secretary.

1.3 Background

The Southern African Development Community (SADC) is a Regional Economic Community comprising 16 Member States, namely; Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, Zimbabwe. Established in 1992, SADC is committed to Regional Integration and poverty eradication within Southern Africa through economic development and ensuring peace and security.

Article 14 of the SADC Treaty establishes the SADC Secretariat as the principal executive institution of SADC. The Secretariat performs its mandate and functions within the policy, strategic and programme provisions outlined in the Regional Indicative Strategic Development Plan (RISDP) and the Vision 2050. The SADC Vision 2050 earmarks Statistics a priority cross-cutting sector whereby by 2050, the region strategic objective in statistics is to realize a robust and responsive regional statistical system to underpin regional integration processes, including measurement of progress and impact.

1.4 Current situation in the sector

In the discipline of Official Statistics there is an absolute necessity of evolving towards programming languages oriented to modern data science to face new challenges such as fast prototyping innovative ideas, standardizing production processes and automatizing manual tasks. The implementation of statistical techniques, methods and methodologies can be done with Python functions and scripts in a more efficient way.

The Secretariat is prioritizing statistical capacity building as part of its implementation plan guided by the Regional Strategy for Development of Statistics (RSDS) 2020-30. With the Regional Statistics Project funded by the World Bank, capacity building shall basically come in the form of development of practical guidelines in specific domains; rolling out national and regional training programmes and; assisting Member States through technical assistance. Data management and processing is within the sub-component 1.1 on improving capacity for data production, management and dissemination of the World Bank project.

With the growing need of analysing voluminous and complex survey data on a timely basis, open-source statistical softwares play a significant role. Thus, Secretariat is

recruiting a consultancy firm which may include but not limited to research centres or universities to train SADC Member States statisticians on Python for beginners and intermediate level.

1.5 Needs assessment

Member States were also requesting training on Python for official statisticians involved or not in Big Data and Data Science activities having no specific knowledge on the subject.

2. OBJECTIVES, PURPOSE AND EXPECTED RESULTS

2.1 Overall objective

The overall objective of this exercise is to train Member States on the use of statistical software for management of large database and analysis of complex surveys.

2.2 Specific objectives (Purpose)

The specific objective of the assignment is to undertake a national training on Python for processing of data for official statistics, especially:

- (i) to introduce participants to the Python language and ecosystem and to make them able to write basic Python programs for data processing, analysis and visualization; and
- (ii) to provide participants with intermediate level knowledge on Python language and ecosystem and to make them able to write Python programs for official statistics.

2.3 Results to be achieved by the Consultancy Firm

The Consultancy Firm is expected to achieve the following result:

- i. Python component: Strengthened technical capacity of Statisticians from National Statistics Offices to have a good understanding of Python language and its ecosystem for use for Official Statistics purposes and to be familiar with syntax of Python for reading of a file, processing of data, modelling, aggregation and visualization.

3. SCOPE OF WORK FOR TRAINING ON PYTHON

3.1 Scope of work

The selected service provider is expected to deliver in-person technical training workshop on Python to process and analyze official statistics for data producers of

official statistics at national level for respective Member State for 10 working days (5 working days for Beginners and 5 working days for intermediate levels)

The training includes theoretical and practical sessions to help participants understand Python syntax and its ecosystem for data management, statistical analysis, tabulations, graphics, and maps from complex census, survey data, and big data. The training report should contain summary of topics covered during training week. Training materials should also be shared to all participants and annexed to be training report

It is expected that the training to be done with real anonymized data obtained from censuses, survey and administrative data undertaken by National Statistics Offices.

3.2 Geographical area to be covered

The assignment will be carried out in 10 selected Member States of SADC Region, namely (Botswana, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Mauritius, Mozambique, Namibia, Seychelles, Zimbabwe).

3.3 Target groups

This consultancy is expected to target the National Statistics Office and other stakeholders, in particular, statisticians involved in processing and analysis of official statistics, large data and complex surveys.

3.4 Specific work

The assignment will be carried out primarily through a national training in five selected Member States of SADC Region.

In particular, the consultant will be required to:

- i. Inception report detailing approach, methods, assumptions, risks, timelines and content of topics covered and training programme
- ii. Develop a generic training materials to cater for practical training on Python.
 - i. To tailor the programme to the needs of each Member State for intermediate level.
 - ii. To deliver the training at mutually agreed dates
- iii. To give training on application of Python in data processing, management and analysis in survey data and census and other complex data, big data, satellite image data and to cover at least the following topics **for beginners' level**:
 - Essentials of Python environment and knowledge about the individual aspects of data processing pipeline (reading file, processing data, saving results, modelling, aggregation, visualization and saving results)
 - Essential syntax of Python; functions, main data structures (tuples, lists, dictionaries)
 - Importing data in Python
 - Creating, manipulating and converting common data structures

- Merging data from different data sources or different questionnaires
 - Writing functions and using pre-existing functions
 - Introduction to the NumPy library
 - Creation and handling of arrays
 - Packages like Pandas, Matplotlib, Seaborn, Scikit-learn, Geopandas,...
- iv. To give training on application of Python in data processing, management and analysis in survey data and census and other complex data, big data, satellite image data and to cover at least the following topics **for intermediate level**:
- Performance and differences with respect to Python lists
 - Object-oriented programming
 - Mathematical operations and broadcasting
 - Use of Encapsulation with Python for official statistics and big data
 - Use of Inheritance with Python for official statistics and big data
 - Usage of universal functions (ufuncs)
 - Polymorphism applied to official statistics
 - Python and production of official statistics
 - Sampling and weighting with Python
 - Statistical models with Python
 - Python and processing of big data
 - Python and satellite image/GIS
 - Python and automation/machine learning
- v. Produce well documented Training Materials to be shared with participants with step-by-step indication for all the topics covered
- vi. Produce a Training Report for each Member State with a summary of topics covered during the training and recommendations for implementation
- vii. To do a pre- and Post-Training Surveys assessment of participants knowledge and identifying areas of improvement

The experts from the Firm shall assist participants in first handling of Python on the first day of the training for them to use it correctly.

3.5 Reserve for continuation of contract

The assignment is for training in 10 SADC Member States. The Firm shall be subject to evaluation after each training in a Member State. Continuation of contract is upon satisfactory completion and quality of the previous assignment.

3.6 Eligible entities

Eligible entities for the current assignment are consultancy firm which may include but not limited to research centres or universities.

4. QUALIFICATION AND EXPERIENCE REQUIREMENTS

This assignment is expected to be carried out by experienced Master Trainers from University, Research Centres and Consultancy Firms and there should be evidence of in-depth knowledge with the open-source softwares (R and Python among others) and trainings at national, regional and international level. The specific profile of Experts is provided below:

Profiles of Experts	Qualifications and Skills	General Experience	Specific Experience
TWO (2) Expert Trainers	- A minimum Masters Degree in statistics, economics, IT, Data Science or related field. PhD degree in the above mentioned field shall be an advantage - Written and oral fluency in the English language is essential. - Excellent oral and written communication, analytical, presentation and report writing skills in English Language. - Excellent time management and organizational skills to prioritize workload and deliver needful during the training week. - French and Portuguese fluency shall be highly desired for undertaking training in French and Portuguese	The Expert Trainers Must have at least ten (10) years of experience using Python	- Demonstrated experience in statistical data processing and analysis, spatial analysis, modelling and data visualization using Python for at least 10 years continuous and for at least 3 surveys for Official Statistics; 7 years experience in data analysis and data visualization for both quantitative and qualitative data and Big Data; 5 years experience using Python to analyse geospatial data/satellite imagery required; - Experience in the design and implementation of training materials during at least 3 trainings for the conduct of statistical data analysis training in Official Statistics using Python; - Extensive experience in as a resource person in delivering at least 5 training on Python at national/regional/international stages, particularly using household and census data. - Experience in working with national statistics agencies, and other government institutions

Profiles of Experts	Qualifications and Skills	General Experience	Specific Experience
	speaking countries		

The expert must be independent and free from conflicts of interest in the responsibilities they take on.

Note that civil servants and other staff of the public administration, of the partner country or of international/regional organizations based in the country, shall only be approved to work as experts if well justified. The justification should be submitted with the tender and shall include information on the added value the expert will bring as well as proof that the expert is seconded or on personal leave.

5. REPORTING REQUIREMENTS AND TIME SCHEDULED FOR DELIVERABLES

5.1 Reporting requirements

The consultant shall operate under the oversight of the Senior Officer – Research & Statistics and direct supervision of Officer – Research and Statistics.

All the deliverables shall be delivered to the Officer – Research and Statistics who shall assess and review the deliverables in line with the requirement of the Term of the References; and approved by the Senior Officer- Research and Statistics.

All reports / training materials shall be in electronic format in MS Word, Excel or PowerPoint format as the case may be. Scripts and commands for Python should be shared with SADC Secretariat and participants. The training materials including power point presentations and Python scripts will be the property of SADC Secretariat and will be used for additional training if required. The Expert shall work with the Secretariat up to the end of the assignment, shall have delivered the following in electronic format within three (3) months:

Name of report	Content	Time of submission
Inception report	The inception should demonstrate how the training will be organised and its effectiveness towards impactful results. It should have include the objectives, expected outcome, methods, assumptions, risks, timelines of the training as well as topics to be covered and training programme	No later than 7 calendar days after the signing of the contract.
Training reports	For each Member State trained, each report should cover: - summary of topics covered during training week;	No later than 10 calendar days after the completion of the national training

	- pre and post training assessment; and - Final Training Materials	workshop for each Member State.
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5.2 Submission and approval of report

The reports referred to above must be submitted to the project manager identified in the contract. The reports must be written in English. The project manager is responsible for approving the reports.

5.3 Project management

Overall responsibility for supervision of the Consultancy will lie with the Senior Officer – Research and Statistics. The Consultant shall be responsible for the operational day-to-day management and coordination of the consultancy work.

5.4 Management structure

The Consultant shall report to the Senior Officer – Research and Statistics and perform the assigned tasks.

6. LOGISTICS AND START DATE

6.1 Location

The assignment will involve traveling to selected SADC Member States.

6.2 Office accommodation

None required

6.3 Facilities to be provided by the contracting authority

For the expert working on this consultancy, the Contracting Authority shall facilitate for visa entry in SADC Member States, if required.

6.4 Facilities to be provided by the contractor

The contractor must ensure he/she is adequately prepared and equipped for delivery of the training and drafting of deliverables. Moreover, the Firm is expected to be fully self-sufficient in terms of international travel associated expenses, laptop and related device connectivity for projector for this consultancy.

6.5 Equipment

No equipment is to be purchased on behalf of the contracting authority / procuring entity as part of this service contract or transferred to the contracting authority / procuring entity at the end of this contract. Any equipment related to this contract that is to be acquired by the procuring entity must be purchased by means of a separate supply tender procedure.

6.6 Start date and period of implementation

The intended start date is as soon as both parties have signed the contract agreement and the period of implementation of the contract will be for 20 months from the date of signing the agreement. Please see Article 3 of the specific contract for the actual start date and period of implementation.

7. MONITORING AND EVALUATION

7.1 Definition of indicators

The indicators to be used are timeliness, technical coverage and analytical quality of the Reports as detailed in 5 above. In addition, assessment of the effectiveness of the training to be done using pre and post test surveys with recipients of the capacity building activity.

7.2 Special requirements

The Consultant must declare any potential conflict of interest between the provision of the requested services, and other activities in which, a member of their consortium of group (s), or any expert proposed in their offer is engaged.

8. ASSUMPTIONS AND RISKS

8.1 Assumptions underlying the project

It assumed that the consultant would be procured within the reasonable timeframe and activities implemented within 20 months after signature of the contract.

8.2 Risks

The nature of the assignment presents negligible risks associated with the consultancy. Some of the foreseen risks are the following:

Possible risks	Risk Level	Mitigation Measures
1. Unavailability of key stakeholders to provide relevant information due to change in the working environment	Medium	Plan and communicate ahead with key stakeholders; have more than one communication means

9. FINANCIAL PROPOSAL

9.1 Financial proposal

The financial proposal should be a lump sum that includes professional fees, travel costs and any other cost for conduct of the trainings in 10 countries with the split of fees individually for the 10 countries.

9.2 Schedule of payment

Payments for the assignment shall be related to the reports and their approval as follows:

10% of the contract price shall be paid upon submission and approval of the inception report and training materials

9% of the contract price shall be paid upon submission and approval of the Training Report for the first Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the second Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the third Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the fourth Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the fifth Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the sixth Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the seventh Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the eight Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the ninth Member State trained

9% of the contract price shall be paid upon submission and approval of the Training Report for the tenth Member State trained





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Signature Request

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Original Document

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Web Evidence

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Signee Email:	tchabwera@sadc.int	Email Subject:	Not available in Silent Mode
Email Sent Timestamp:	Not available in Silent Mode	Email Opened Timestamp:	Not available in Silent Mode

Web Evidence

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