



NATIONAL RESEARCH & INNOVATION MONITORING FRAMEWORK

TANZANIA COMMISSION FOR SCIENCE AND TECHNOLOGY

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FOREWORD



Science, Technology and Innovation (STI) indicators are crucial in monitoring a country's scientific and technological developments and guiding the country towards achieving its' target of 1% of GDP investment in Research and Development.

It is also important for a country to be able to collect national STI data that is comparable with internationally accepted STI indicators that will help in informing the country's performance in STI.

This framework puts forth a coherent set of indicators for monitoring the outcomes, outputs and impact of investment in research and innovation.

I believe that this Framework will provide a structured manner to monitor research and innovation in the country hence contributing to our ability to make evidence-based decisions in the area of science, technology and innovation.

The Framework will allow for a national level analysis by establishing trends in technological development, research and innovation so that we can determine specific areas that need investment and capital development.

This Framework is not meant to replace existing institutional monitoring systems but rather to ensure that indicators identified in this framework are captured for high-level analysis.

It is my sincere expectation that all institutions engaged in research, innovation and technological development will support the implementation of the Framework.

A handwritten signature in black ink, appearing to read 'Makenya Abraham Honoratus Maboko'.

Prof. Makenya Abraham Honoratus Maboko

CHAIRPERSON OF THE BOARD

ACKNOWLEDGEMENT



The framework and its operational tools have been developed through a series of consultations with stakeholders including policymakers, researchers, academicians and regulatory authorities.

The Tanzania Commission for Science and Technology (COSTECH) extends its appreciation to all institutions that were involved in piloting of the framework and its tools before finalization.

COSTECH acknowledges the participation and contribution of various institutions towards this framework. Several institutions were involved including University of Dar es Salaam, Sokoine University of Agriculture, Ardhi University, Kilimanjaro Medical University College, St. John University of Tanzania,

Mzumbe University, Tanzania Forestry Research Institute, Tanzania Fisheries Research Institute, Tanzania Livestock Research Institute, Tanzania Pesticides Research Institute, Nelson Mandela African Institute of Science and Technology, National Institute for Medical Research, Zanzibar Agricultural Research Institute, Hubert Kairuki Memorial University, University of Dodoma, Tanzania Veterinary Laboratory Agency, Tanzania Wildlife Research Institute, Muhimbili University of Health and Allied Sciences, Tanzania Coffee Research Institute, Economic and Social Research Foundation;

Open University of Tanzania, State University of Zanzibar, Tanzania Industrial Research Development Organisation, Institute of Social Work, Tanzania Commission for Universities, Office of the Chief Government

Statistician, Tanzania Food and Drugs Authority, Zanzibar Planning Commission, Second Vice Presidents' Office and Tanzania Automotive Technology Centre.

The contribution of Government Ministries, Planners and Authorities responsible for research and innovation activities was very useful in tailoring the process towards national priorities and relevant mechanisms for acquiring and potential use of the data.

These include Tanzania Ministry of Education, Science and Technology, Tanzania Ministry of Agriculture, Livestock and Fisheries, Tanzania Planning Commission, Zanzibar Planning Commission, Tanzania Commission for Universities, Tanzania National Bureau of Statistics, Office of the Chief Government Statistics Zanzibar and Office of the Second Vice President Zanzibar.

Swedish Research Council as the key research and Innovation partner to COSTECH provided technical inputs at all stages of developing the framework and tools. Financial support was provided by the Swedish International Development Cooperation Agency (Sida). COSTECH staff who had coordination role are also acknowledged for the effort that made this framework a reality.



Dr. Amos Muhunda Nungu

DIRECTOR GENERAL

ACRONYMS

AOSTI	African Observatory for STI
AMCOST	African Ministerial Conference on Science and Technology
ASTII	African Science Technology and Innovation Indicators
AU	African Union
COSTECH	Tanzania Commission for Science and Technology
CPA	Consolidated Plan of Action
GDP	Gross Domestic Product
HLIs	Higher Learning Institutions
IRB	Institutional Review Board
M&E	Monitoring and Evaluation
NEPAD	New Economic Partnership for Africa's Development
OECD	Organization for Economic Cooperation and Development
REC	Research Ethics Committee
R&D	Research and Development
STA	Science and Technology Activities
STET	Scientific and Technical Education and Training
STI	Science, Technology and Innovation
STS	Scientific and Technological Services
TDV	Tanzania National Development Vision

TABLE OF CONTENTS

FOREWORD	4
ACKNOWLEDGEMENT	6
ACRONYMS	8
TABLE OF CONTENTS	9
1. INTRODUCTION	11
1.1 Background	11
2. FRAMEWORK RATIONALE	14
3. METHODOLOGY	15
4. OBJECTIVES OF THE FRAMEWORK	16
Objective	16
Specific Objectives	16
5. INTENDED USE OF THE FRAMEWORK	17
6. MONITORING INDICATORS	18
Dimension 1: Scientific and Technological Research	
Competence	19

Dimension 2: Intellectual Property and rights	20
Dimension 3: Collaboration and Interaction	20
Dimension 4: Entrepreneurship and Innovation Culture	20
Dimension 5: Economic Contribution and Commercialization	21
Dimension 6: Innovation Support services	21
Dimension 7: Research & Development Funding and expenditure	22
Dimension 8: Policies Guidelines and Strategies for Research & Development Management	22
7. MONITORING REQUIREMENTS	23
8. REPORTING REQUIREMENTS	23
9. RESPONSIBILITIES FOR DATA PROVISION	23
10. SYSTEM SUPPORT	24
11. FRAMEWORK REVIEW AND LEARNING	25
12. APPENDICES: National Monitoring Tool for Research and Innovation	26

1. INTRODUCTION

1.1 Background

The Tanzania National Development Vision 2025 (TDV 2025) states the commitment of the country to build a strong, dynamic, resilient and competitive national economy, which is skill-based knowledge and innovation driven. Evidence has shown positive gains derived from scientific research and innovations.

Research and Development (R&D) has been a source of investment for developing learning capabilities and expanding technological opportunities that enterprises draw upon as they develop and innovate products and services. Research, whether done by public or industry, supports capacity building churning out graduates who upon entering the job market transfer their skills and knowledge to the public and private sector.

Research should focus on the needs of industry. According to OECD (2003:60) expenditure on R&D can be considered as an investment in knowledge that can translate into new technologies and serve as a basis for efficient utilization of resources.

In recognition of the benefits of R&D investment, African governments under the leadership of the African Union (AU) committed to increasingly invest at least 1-3% of their gross domestic product (GDP) in R&D. In 2005 the President of Tanzania, His Excellency Hon. Benjamin Mkapa announced the country's commitment to spend 1% of the country's GDP on R&D.

That was a significant increase from the 0.3% of the GDP expenditure on

R&D at that time. By 2014, expenditure on R&D was estimated at 0.52% of the country's GDP. Although this falls short of the 1-3% target, it clearly shows that over the years there has been a significant increase in funds allocated for R&D.

In 2005 the African Ministerial Conference on Science and Technology (AMCOST) held in Dakar expressed, through the Africa's Science and Technology Consolidated Plan of Action (CPA), the need to collate data and statistical information on Science, Technology and Innovation (STI). This directive implied the establishment of a regional level effort to monitor and track STI input and outputs.

The CPA commenced with the African Science, Technology and Innovation Indicators (ASTII) programme (year) as a flagship initiative in this regard. The ASTII programme had two interrelated projects, one focused on the development and adoption of a common STI indicators framework and the second institutionalized the first through the establishment of the African Observatory for STI (AOSTI). The purpose of the ASTII programme was to build Africa's capacity to develop and use STI indicators and that following this continental initiative, nations would scale down to their own monitoring framework including evaluation and learning.

The development of a national monitoring, evaluation and learning framework for tracking progresses in Science, Technology and Innovations, is an important management tool to inform the government on the output, outcomes and impact of R&D activities in the country. This shall be a national mechanism to measure the impact of STI interventions for utilization in planning, resource allocation and decision-making.

A National Research and Innovation Monitoring Framework set out

coherent indicators for monitoring the outcomes, outputs and impacts of investment in research and innovation. A framework provides for better coordinated efforts in reporting and promoting the social and economic returns of investment in research and innovation.

Enterprises, R&D and Higher Learning Institutions (HLIs) will use this framework as a guide in reporting outputs, outcomes and impacts of their research and innovation activities to allow for a national level analysis with regards to progress in research and innovation.

It is envisaged that lessons learnt from this analysis will inform decisions on necessary adjustment required for greater returns to investment on research and innovation. The framework builds on the already agreed international STI indicators and contextualizes them to suit the needs at the national level.

2. FRAMEWORK RATIONALE

Research and innovation are important sources of generating appropriate technologies and solutions that can accelerate economic and social development process of the country. HLIs and R&D institutions are the main source of research outputs and technological products and services.

The current practice is that some R&Ds and HLIs have individual monitoring systems and in many of the institutions similar systems are absent. Institutions that have monitoring systems the indicators are based on their own needs and that of funding entities.

As a result without standardization, data collected from HLI's, R&D institutions and industry cannot be compared and/ or aggregated making it difficult to gauge the contribution and progress made by a country as a result of investments in research and innovation.

The Tanzania Commission for Science and Technology (COSTECH) has the mandate to coordinate, promote and disseminate R&D outputs and outcomes in the country. Thus, it is envisioned that the development of a national monitoring framework will facilitate documentation and consolidation of output, outcomes and impact of R&D activities in the country.

A high-level, structured framework provides common indicators and guidelines to facilitate reporting of research and innovation outputs, outcomes and impacts whilst recognizing the value and role of individual institutions monitoring systems.

The framework also provides the basis to demonstrate the benefits of

R&D and Innovation to society, stimulating public interest in engaging with HLI, R&D institutions and industry in search of relevant solutions to development challenges in Tanzania. The framework is considered an important information mechanism for both government, industry and development partners as it provides foresight and also facilitates determining specific areas of R&D and innovation for focus based on technological trends.

3. METHODOLOGY

The development of the framework was participatory engaging a number of stakeholders from R&Ds, HLI's, Swedish Research Council, Tanzania National Bureau of Statistics, Innovators, Office of the Second Vice President of Zanzibar, Office of the Chief Government Statistician of Zanzibar, Research Institutions and Ministry of Education, Science and Technology.

Several working sessions were organized to brainstorm on data needs, sources and use. The discussion also identified key indicators used to gauge STI internationally and regionally to inform on indicators to be measured by the framework.

4. OBJECTIVES OF THE FRAMEWORK

Objective

To enhance effective coordination, promotion and dissemination of R&D and Innovation in the United Republic of Tanzania as part of ensuring relevance and accountability to national development efforts.

Specific Objectives

- i. To identify and define key indicators for monitoring and communicating research work
- ii. To systematically track the research process for monitoring of outputs, outcomes and impacts
- iii. To institutionalize a Research Monitoring and communication system in HLIs, industry and R&D institutions
- iv. To facilitate the availability of research and innovation information in Tanzania
- v. To help research funders establish the value of investing in research and innovation
- vi. To disseminate findings in a manner appropriate to the various stakeholders to support effective uptake of research results and innovation and informed decision for policy makers
- vii. To monitor technological trends and determine specific research areas that need investment and capacity development
- viii. To show evidence on contribution of research and innovation in national development

5. INTENDED USE OF THE FRAMEWORK

The framework will provide minimum indicators to be adopted by R&D HLLs and industry to track and report implementation, outputs, outcomes and impacts of conducted research and innovation.

The framework is not meant to replace existing institutional monitoring systems but rather to ensure that indicators identified in the framework are captured for a higher level of monitoring and evaluation. Data emanating from the final analysis of the monitoring exercise is to be shared with the relevant stakeholders.

6. MONITORING INDICATORS

This document has adopted eight dimensions of indicators based on international standards and guidelines, which are derived from international and regional best practice documents. i including the Frascati¹, Oslo² Manuals, and the ASTII developed by New Economic Partnership for Africa's Development (NEPAD).

These document will deal with R&D and innovation indicators³. These international and regional standards and guidelines provide guidance in the generation of Science and Technological Activities (STA) indicators that enable comparison between countries as well as addressing local development needs.

STA is broadly defined to include all systematic activities concerning generation, advancement, dissemination, and application of scientific and technical knowledge innovation in the fields of Natural Science, Engineering & Technology, Medical and health Science, Agricultural Sciences, Social Science, and Humanities.

STA is categorized in three groups; R&D, Scientific and Technical Education and Training (STET), and Scientific and Technological Services (STS). Other equally important surveys for monitoring research, technological and innovation development include the Scientific, Technological Education and Training (STET), Scientific and Technological Services

¹The Frascati Manual sets forth the methodology for collecting statistics about research and development. The Manual was prepared and published by the Organisation for Economic Co-operation and Development initially in June 1963 though there have been several revisions and updates.

²The Oslo Manual, contains guidelines for collecting and using data on industrial innovation. It is an OECD document entitled "Measurement of Scientific and Technological Activities, Proposed Guidelines for Collecting and Interpreting Technological Innovation Data", The first version was developed in 1996.

³Research and Innovation activities are considered as those which lead to generation of new knowledge and practices. Research activities can be basic, applied or experimental. Innovation involves the creation and diffusion of new products, processes and methods.

(STS) and Bibliometric analysis were developed with recognition that scientific research and innovation takes place in Higher Education, research institutions and research laboratories.

Outside the R&D the other indicators will be dealt in other documents. Eight dimensions/categories of the indicators for R&D and Innovation adopted for R&Ds HLLs and industry are as follows:

Dimension 1: Scientific and Technological Research Competence

- 1.1 Number of peer reviewed publications (local/regional and international)
- 1.2 Number of R&D and innovation projects/grants
- 1.3 Number of local and international science awards received
- 1.4 Number of scientific awards provided by the institution
- 1.5 Number of Masters, PhD. Graduates and Postdoctoral Researchers
- 1.6 Number of Masters, PhD. and Postdoctoral Researchers outputs
- 1.7 Number of staff involved in research
- 1.8 Number of policy recommendations adopted by industry and Government
- 1.9 Number of ISO certified laboratories
- 1.10 Number of novel/key laboratory facilities
- 1.11 Number of other institutions sharing the laboratory facilities
- 1.12 Number of technical personnel operating research facilities
- 1.13 Frequency of use of the novel facility per year

Dimension 2: Intellectual Property and rights

- 2.1 Number of patents applications filed (local & international)
- 2.2 Number of patent certificates granted
- 2.3 Number of utility models/industrial design certificates applications filed
- 2.4 Number of utility models/Trade-mark registered
- 2.5. Number of copyrights registered
- 2.6 Number of breeder's rights filed/registered
- 2.7 Number of IPs commercialized

Dimension 3: Collaboration and Interaction

- 3.1 Number of R&D and innovation projects as the result of institution – industry local collaborations
- 3.2 Funds received from R&D and innovative projects as the result of institution – industry local collaborations
- 3.3 Number of R&D and innovation projects as the result of international collaborations
- 3.4 Funds received from international R&D and innovation collaborations
- 3.5 Collaboration with local and international institutions

Dimension 4: Entrepreneurship and Innovation Culture

- 4.1 Number of training in entrepreneurship, technology management and innovation management
- 4.2 Number of staff working within the management of technology transfer offices, techno parks, incubation centers, and innovation space and technology development centers

Dimension 5: Economic Contribution and Commercialization

- 5.1 Number of spin-off/start-up companies registered
- 5.2 Number of active incubation centers/ development technology centre's operating in the universities
- 5.3 Number of spin-off/start-up companies active in techno techno parks, incubation centers or technology development centers
- 5.4 Number of people employed in spin-off/start-up companies, techno parks, innovation space, incubation centers or technology development centers
- 5.5 Number of services, research products and processes developed and adopted by industry and Government

Dimension 6: Innovation Support services

- 6.1 Number of Institutions with IP Policy
- 6.2 Number of Institutions with Technology Transfer Office / Intellectual Property Management Office
- 6.3 Number of materials transfer agreements
- 6.4 Number of technology transfer agreements
- 6.5. Number of services transfer agreements
- 6.6 Number of Institutions providing access to patent and non-patent information (Scientific information)
- 6.7 Number of Institutions providing Protection of Intellectual Property services

Dimension 7: Research & Development Funding and expenditure

- 7.1 Funds received from government
- 7.2 Funds received from the industries
- 7.3 Funds received from local institutions
- 7.4 Funds received from individuals
- 7.5 Funds received from international organizations
- 7.6 Percentage of research & development expenditure per priority sector
- 7.7 Amount of funds received for R&D and innovative projects

Dimension 8: Policies Guidelines and Strategies for Research & Development Management

- 8.1 Number of Institutions with policies/ guidelines to oversee Research & Development
- 8.2 Number of Institutions with active Research Ethics Committees/ Institutional Review Boards
- 8.3 Number of Institutions with electronic registry for research projects/ programs and products/outputs
- 8.4 Number of Institutions using plagiarism software
- 8.5 Number of institutions with research communication strategy/ guideline

7. MONITORING REQUIREMENTS

Accountability of both providers and receivers of research information is key to establish an effective monitoring system. R&D and HL institutions through their monitoring system/unit shall deliver complete, accurate and timely data as per established indicators on continuous basis to enable tracking of developments in research and innovation in their respective institutions.

The R&D institutions, HLIs and industry shall be required to fill a national monitoring tool on annual basis (Annex 1-4) and submit to the national coordinating body (COSTECH). COSTECH in partnership with National Bureau of Statistics and the Office of Chief Government Statistician of Zanzibar shall ensure the data are aggregated, processed, analyzed and produce a report that can be used to advise the Government accordingly.

8. REPORTING REQUIREMENTS

HLIs R&D institutions and industry shall be required to report the research and innovation activities progress once per year, during the first quarter of a new Government financial year. Prior to the development of an online system institutions will be required to submit hard copies of filled monitoring tools. Once the online system is developed submission will be done electronically.

9. RESPONSIBILITIES FOR DATA PROVISION

Directorate/department or unit responsible for coordinating research and innovation activities within the institutions shall take responsibility in ensuring timely, complete and accurate submission of information.

It is recommended that the data collection process be institutionalized which will constitute establishing a coordinating mechanism within the respective institutions (office/person) who will manage all activities related to collecting and compiling information at institutional level.

It is important that the appointed office/ person is familiar with the framework and the definition and categorization of the different dimensions of the indicators.

10. SYSTEM SUPPORT

Institutions have a primary responsibility to ensure that internal systems for monitoring are well functioning. The national research coordinating body (COSTECH) will provide systems support to R&D institutions, HLIs and industry whenever necessary; such as strengthening an electronic submission systems and capacity building for data collection/ management to the staff responsible for reporting the research results at institution level.

It is expected that institutions will effectively utilize their existing infrastructure for monitoring purpose to ensure the sustainability of the process. This is to be done through leveraging research and innovation resources obtained from various sources. Institutions are encouraged to be innovative and establish strong systems that will ensure delivery of quality information to meet the national monitoring targets/goals.

11. FRAMEWORK REVIEW AND LEARNING

The framework will be reviewed after every five years or as need arises. It is envisaged that lessons learnt in the course of implementing the framework will inform adjustments to be made for improved effectiveness of the framework and resource utilization in research and innovation.

This information is crucial as it will enable the country to determine research and innovation areas that are of priority to the country but receive minimal interests from other stakeholders. This will enable the Government to redirect resources to these areas for sustainable and inclusive economic growth.

12. APPENDICES: National Monitoring Tool for Research and Innovation

MODULE 1: GENERAL

Preamble

Tanzania is implementing its development Vision 2025 which aims at transforming the country into a middle-income economy to enable the majority of population enjoy enhanced livelihood. There is significant contribution of Research and Development (R&D) in the implementation of the National Vision. Thus, COSTECH ought to collect information for monitoring the contribution of R&D into the national economy.

A monitoring tool has been developed to track national development arising from investments in research, technology and innovation. The tool is derived from the apparent document “National framework for monitoring Research and Innovation” in Tanzania. The collected information will contribute to gather data on Science, Technology and Innovation (STI) indicators as determined in the Tanzania Five Years Development Plan II.

This tool and the parent document (the monitoring framework) were developed through a series of consultative processes between Tanzanian Commission for Science and Technology (COSTECH) and various representatives from Higher Learning Institutions, Research and Development Institutions and Government Departments. Being the first of its type to be administered at a national scale in Tanzania, this tool is still evolving and will be revised as availability of data from institutions advances. This questionnaire should be fully completed unless the questions are not relevant to your organization and should be indicated as such. It is divided into 8 dimensions i.e.

1. Scientific and Technological Research Competence;
2. Intellectual Property Rights;
3. Institutional Collaboration and interaction;
4. Entrepreneurship and Innovation Culture;
5. Economic Contribution and Commercialization;
6. Innovation Support Services;
7. Research and Development Funding; and
8. Policies and Guidelines for Research and Development Management.

Operational definition of key terms

Research: a diligent and systematic investigation into a subject in order to discover or revise facts, theories, applications, etc. to increase the stock of knowledge to devise new applications.

Research institution: an organization/institute that is mandated with conducting research activities and may be providing teaching services.

Higher Learning Institution (HLI): an institution that is mandated with providing academic (teaching), research and consultancy services.

Researcher: an employee of a higher learning institution or research institution who is employed as a core staff in research and allied activities. E.g. lecturers and their assistants (academic staff); research officers and their assistants; research fellows; etc.

Technician: an employee of a higher learning institution or research institution who is employed as a technical support staff in a certain discipline of research. E.g. laboratory scientists/technicians; Field

officers; etc.

Administrative/Support staff: an employee of a higher learning institution or research institution who is employed as a non-research staff to provide administrative support for the institution. E.g. Human Resource officers; Accountants; office attendants; drivers; etc.

Scientific Publication: a peer reviewed article or report that has been published in a scientific journal

Technical Report: a scientific report that has emanated from a professional/technical assignment. E.g. consultancy reports and all reports for use, nationally or internationally, by governments or private sector.

Dissemination: a process of transferring research or innovation output to targeted beneficiaries.

Research Facilities: equipment, physical and software infrastructures that are used for research and allied activities in an institution

Innovation: application of better solutions to improve a product or a process, which result in a new (improved) method, idea, product, etc.

Active Research Committee: a committee established for a common purpose of promoting conditions that advance the body of knowledge within a desired field of science.

Techno parks: are regions prepared by the State for the filing and installation of various technology companies aimed to encourage

innovation and the creation of products or services that generate significant added value.

Innovation spaces: are public or private (corporate) spaces with state-of-the-art technologies aimed to advance ideas and product development. They are built for specific clusters (such as pharmaceuticals or robotics) and are used by wildly diverse groups (companies, startups, students).

Incubation center: is a program managed by corporations, educational institutions or government agencies that provide an environment for startups to develop by providing services such as management training, technology and office space.

Consultancy report: Consultancy reports are written for a non-specialist audience. Often they are written in response to a request for information from an organization or business. It is the consultant's responsibility to make sure that the reader can understand the information presented.

Policy: is a set of ideas or plans that is used as a basis for making decisions, especially in politics, economics, or business.

Project brief: a brief description of the objective and background/context for the overall project. It outlines the project management framework to be adopted for the initiation phase, including how to measure the success of the phase; deliverables, budget and resources; project activities and milestones; governance and reporting requirements; communication with stakeholders; risk and issues management; assumptions and constraints; related projects and interdependencies; guidelines/standards; levels of review; quality assurance and capturing lessons learned.

A. INSTITUTION PROFILE (Fill /Tick appropriate)

Name of Institution: _____

Date of Interview: _____

Type of Institution: Higher Learning Research & Development

Industry

Owner ship: URT/ RGoZ Private for Profit Private (Non Profit)

Other Specify _____

Location: Region _____ District _____ Ward _____ Shehia

Name of Institution's Head _____

Designation/ Title: _____

Gender (Male /Female) _____

Institution Address: Mail Box _____

Email: _____

Tel: _____ Fax: _____

Website _____

Contact / Focal Person filled the questionnaire _____

Directorate/Department _____

Email address _____

Mobile Number _____

Period of reporting (Previous Financial year e.g 2018/2019):

A MONITORING DIMENSIONS

Dimension 1 Part 1: Scientific and Technological Research Competence

		Scientific Skills and Output								
1.1	Number of staff (Full time)	Postdoc		Doctorate		Masters		Bachelor		Diploma /Certificates
1.1.1		F	M	F	M	F	M	F	M	F M
	Researchers									
	Technicians									
	Supporting/administrative staff									
	Staff in contract/temporary									
	Staff on study leave			F					M	
	Staff currently registered for Diploma/ Certificate by gender									
	Staff currently registered for Bachelor by gender									
	Staff currently registered for Masters by gender									

	Staff currently registered for PhDs by gender							
	Staff currently registered for Postdoc by gender							
1.1.2	Number of staff by age	Researchers		Technicians		Supporting/ (Administrative staff)		
		F	M	F	M	F	M	
	18 - 24							
	25 - 40							
	41 - 50							
	51 - 60							
	Above 60							
1.1.3	Number of staff by specialization	F					M	

	Physical Sciences e.g. Chemistry, Physics, all engineering Computer Sciences/ IT, geology e.tc		
	Social Sciences and Humanities e.g. business, sociology, political sciences, history, language, Law, psychology, anthropology, archeology, economics, religious studies etc		
	Life Science e.g. Biomedicine, Human health, agriculture, livestock, marine & fisheries, natural resources etc		
1.1.4	Number of scientific publication in peer reviewed journals in		
		Open access	Closed access
	Local journals		
	East Africa		
	International journals		
1.1.5	Number of published technical writings		
			Number

		Post graduate thesis/dissertations						
		Proceedings						
		Consultancy report						
		Technical reports						
		Policy & project brief						
		Newsletters						
1.1.6	Number of Science Technology and Innovation (STI) events organized by your organization (e.g. conference, public lecture,)	Conferences/ fora	Exhibitions	Workshop/ seminar	Extension services			
1.1.7	Number of local and international awards in research technology/ innovation received by your organization	Local / East Africa		International				
	To be filled by Higher Learning Institutions ONLY							
			F	M				
1.1.8		Number of registered Masters students by gender						

1.1.9		Number of registered PhD students by gender		
1.1.10		Number of Master graduates by gender		
1.1.11		Number of PhD graduates by gender		
1.1.12		Number of Postdoctoral Researchers with contracts (working with organization)	Number	Areas of specialization
1.1.13		Number of completed Postdoctoral Research projects and areas of specialization	Number	Areas of specialization
1.1.14		Did your organization disseminate research results/ technology/innovation outputs that influenced policy/guidelines/decisions? If yes please specify	Yes	No

***1.1.4 should not include predatory journals**

Dimension 1 Part 2: Scientific and Technological Research Competence (infrastructure)

1.2.1	Is the organization certified/ accredited? (if Yes, mention type of accreditation)	Yes	No
1.2.2	Is the organization ISO certified?	Yes	No
1.2.3	Mention name and number of functioning laboratories (including computer laboratories)	Name of laboratory	Number
1.2.4	Institutions sharing your laboratory facilities	Name of laboratory	Name of Institutions
1.2.5	Mention number of accredited/ certified laboratories		
	Type of accreditation/ certification	Number of laboratories	
	ISO 9001		
	ISO/IEC 17025		
	ISO 14001		
	Others specify		
	Not applicable		

1.2.6	Mention all research facilities owned by the institutions (e.g. farms, cold rooms (bio-depository), surveillance systems, digital data and journal depositories	In use (frequency eg. Daily/ Once in a while	Not in use (Reasons)
1.2.7	Other institutions sharing the facilities (other than laboratory)	Name of institution	Facility shared

		Yes	NO
1.2.8	Does the institution have a Planned Preventive Maintenance (PPM) policy/ guideline?		

Dimension 2: Intellectual Property Rights

2.1	Number of application filed for:	Local	International
	Patent		
	Utility models		
	Industrial design		
	Trade mark		
	Copy rights		
	Plant breeder's rights		
	Others specify		
2.2	Number of granted	Local	International
	Patent		
	Utility models		
	Industrial design		
	Trade mark		
	Plant breeders		
	Others (specify)		
2.3	Number of commercialized:	Local	International

	Patents		
	Utility models		
	Industrial design		
	Plant breeders' rights		
2.4	Number of licensed	Local	International
	Patent		
	Utility models		
	Industrial design		
	Trade mark		
	Copy rights		
	Plant breeders rights		

Dimension 3: Research and innovation collaboration and interaction

3.1	Number of Research/ Innovation projects implemented as the result of institution – industry/MSMEs collaborations	Research			Innovation
3.2	Funds received for Research / Innovation projects as the result of institution – industry collaborations				
3.3	Number of Research / Innovation projects as the result of international collaborative projects	Research			Innovation

3.4	Funds received for Research / Innovation collaborative projects	Research (Tsh)			Innovation (Tshs)		
3.5	Number of collaboration with local institutions	R&Ds	HLIs	MSME/ Cluster	LGAs	MD As	NGOs

Dimension 4: Promoting Entrepreneurship and Innovation Culture

4.1	Does your organization provide any training on	Yes	No. of trainings	No
	Entrepreneurial skills			
	Technology management			
	Innovation management			
4.2	Does your institution organize training for its staff on:	Yes	No	
	Entrepreneurial skills			
	Technology management			
	Innovation management			
4.3	Does your institution have:	YES	NO	
	Technology transfer office			
	Innovation space			
	Incubation centre			
	Technology development centre			

4.4	Number of staff working within	F	M	
	Management of technology transfer offices			
	Techno parks			
	Incubation centers			
	Technology development centers			
	Innovation space			
Dimension 5: Economic Contribution and Commercialization				
5.1	Name spin-off companies emanated from your institution			
5.2	Name start-ups companies emanated from your institution			
5.3	Number of services, research products or processes developed as results of:	No. of Services	No. of Products	
	Techno parks			
	Incubation center			
	Technology development centers			
	Innovation space			
5.4	Number of services, research products or processes adopted (in use) from:	No. of Service	No. of Products	

	Techno parks			
	Incubation center			
	Technology development centers			
	Innovation space			
5.5	Number of technical staff providing external support to:	Number		
	Technology development centers			
	Techno parks			
	Innovation space			
	Incubation center			

5.6	Does your organization have an industrial liaison unit /Outreach / industrial cooperation bureau?	Yes	No
	Which support did you provide in the following areas (tick where appropriate)		
	Financial		
	Technical		
	Utility		
	Infrastructure		
	Linkage with financial institutions		
	Linkage with markets		
	Other kind of support (specify)		

Dimension 6: Innovation Support Services

6.1	Does your institution have an institutional Intellectual Property policy?	Yes	No
6.2	Does your institution have:	Yes	No
	Technology Transfer Office		
	Intellectual Property Office		
	Number of fulltime staff	Female:	Male:
	Number of Part time	Female:	Male:
6.3	Number of agreements in:	Number	
	Does the institution have the materials transfer agreements? (Please specify)		
	Materials Transfer		
	Technology Transfer		
	Service Transfer		
	Memorandum of Understanding (MoU)		
6.4	Does your institution facilitate protection of intellectual property to its staff	Yes	No
6.5	Does your institution have Technology and Innovation Support Centre (TISCs)	Yes	No
6.6	Does your institution have subscription in patent and non-patent database? If yes mention:	Yes	No

Dimension 7: Research and Innovation Funding

7.1	What are your sources of funding and amount received from the different sources	
	Source	Amount in Tsh.
	(a)URT	
	(b) RGoZ	
	(c) Tanzania Government (Local Government)	
	(d) Tanzania Commission for Science and Technology (COSTECH)	
	(e) NGOs	
	(f) Donors	
	(g) Private sector/	
	(h) Individual donations	
	(i) Institutional fund (generated within)	
	(j) Industry	
	(k) Other (specify)	
7.2	Please provide your institution's expenditure information on Research and Innovation by priority sectors as outlines below	Amount in Tshs

	Agriculture (crop, livestock)	
	Manufacturing	
	Services (Health, education, water and sanitation ICT and transport)	
	Mining, construction and quarrying	
	Blue economy (sea, fresh water and aquaculture)	
	Others (specify)	

Dimension 8: Policies & Guidelines for Research and Development Management

8.1	Does your institution have the following policies or guidelines to govern research processes in your institution? (tick where applicable)	Yes	No
	Research integrity guidelines		
	Research Ethical Committee/ Institutional Review Boards guidelines		
	Research and Publication Policy		
	Innovation and intellectual property policy		
	Research Grants manual		
	Gender policy		
	Monitoring and Evaluation policy		
	Research Agenda (Priorities)		
	Others		

8.2	Does your institution have an active Research Ethics Committee/IRB	Yes	No
8.3	If yes, how many times does the Ethics committee meet per year?		
8.4	Does your institution maintain an electronic registry of research projects and research outputs by staff and students	Yes	No
8.5	Does the institution have a software to track plagiarism?	Yes	No

THANK YOU FOR YOUR TIME AND EFFORT

Name of Interviewer: _____ Signature _____ Date _____

Name of Supervisor: _____ Signature _____ Date _____

MODULE 2:

INNOVATIVE ENTREPRISES

Authority

The National Bureau of Statistics (NBS) and Office of Government Statistician of Zanzibar (OCGS) are mandated to conduct the survey of inputs into Research and Development (R&D) for the Tanzania Commission for Science and Technology (COSTECH), under the Ministry of Education, Science and Technology (MEST). The survey is a component of Official Statistics, as defined in the Statistics Act 2015. As such, organizations are legally required to respond to this request for data.

About this survey

This survey collects information about product and process innovation as well as organisational and marketing innovation for annual Government financial year e. g 2018/2019

Scope

The statistical unit for the survey is the enterprise (An enterprise refers to a business, company or firm and can range from a very small concern with only one or two employees to a much larger and more formal business or firm

Confidentiality

All information gathered by this survey will be held in strictest confidence. Under no circumstances will NBS, OCGS or COSTECH publish, release or disclose any information on or identifiable with, individual firms or business units.

PART 1: General information about the enterprise, business, company or firm

1.0

Name of enterprise: _____

Year of establishment: _____

Main activity: _____

Date of Interview: _____

Location: Region _____ District _____ Ward _____
Shehia

Name of enterprise's Head _____

Designation: _____

Gender: Male/Female _____

Enterprise Address: Mail Box _____

Email: _____

Tel: _____ Fax: _____

Website _____

Contact Person filled the questionnaire _____

Department _____

Email address _____

Mobile Number _____

Period of reporting (Last Financial year): _____

1.1	Short description of your main business activity:		
		Yes	No
1.2	<p>Is your enterprise part of a larger group? A group consists of two or more legally defined enterprises under common ownership. Each enterprise in the group may serve different markets, as with national or regional subsidiaries, or serve different product markets. The head office is also part of an enterprise group.</p>		
		<p>If yes, in which country is the head office of your group located?</p>	

If your enterprise is part of an enterprise group, please answer all further questions only for your enterprise in Tanzania
Do not include results for subsidiaries or parent enterprises outside of Tanzania

1.3	In which geographic markets did your enterprise sell goods or services during the year 2018/19?	Yes	No	(specify)
	Tanzania (only some regions)			
	Tanzania (national)			
	East Africa			
	Rest of Africa			
	Europe			
	America (South/ North)			
	Asia			
	Australia			

1.4	What was your enterprise's total number of employees in 2018/2019? Average number of employees (add to definition of terms), both full-time and part-time. If not available, give the number of employees at the end of each year.
	2018/19 <input type="text"/>

1.4.1	Approximately what percentage of your total employees had a university degree	<input type="text"/> %
-------	---	------------------------

1.4.2	Approximately what percentage of your total employees had a diploma	<input type="text"/> %
-------	---	------------------------

1.5	What was your enterprise's approximate total turnover for 2018/19? Turnover is defined as the market sales of goods and services (Include all taxes except VAT). <i>Please give turnover in Thousands ('000s) of Tanzania Shse.g. One million Tshs] should be entered as 1,000: 1,000,000 = Tshs.1m.</i>	
	2018/19	Tanzanian Shillings <input type="text"/> ,000

PART 2: PRODUCT (GOODS OR SERVICES) INNOVATION

A product innovation is the introduction to market of a new or significantly improved good or service with respect to its capabilities, such as improved user-friendliness, components, software or sub-systems. The innovation (new or improved) must be new to your enterprise, but it does not need to be new to your industry sector or market. It does not matter if the innovation was originally developed by your enterprise or by other enterprises.

Please note: The latest terminology classifies “products” as consisting of both “goods” and “services”. For example, a firm in the financial services sector may talk of a “new financial product”. The provision of innovative services is of increasing importance in competitive economies. The survey aims to cover both manufacturing and services orientated firms.

2.1	During the year 2018/19, did your enterprise introduce:	Yes	No	<input type="text"/>
-----	---	-----	----	----------------------

	<ul style="list-style-type: none"> ▶ New goods. Exclude the simple resale of new goods purchased from other enterprises and minor changes that only alter the appearance of the product. 			
	<ul style="list-style-type: none"> ▶ Significantly improved goods 			
	<ul style="list-style-type: none"> ▶ New services. 			
	<ul style="list-style-type: none"> ▶ Significantly improved services 			
			<p>If NO to BOTH questions, please go to question 3.1.</p>	

2.2	Who developed these product (goods and services) innovations?			
	<ul style="list-style-type: none"> ▶ Mainly your enterprise itself 			
	<ul style="list-style-type: none"> ▶ Your enterprise together with other enterprises* or institutions** ▶ (*) independent enterprises plus other part of your enterprise group (such as subsidiaries, sister enterprises, head office, etc. ▶ (**) universities, research institutes, non-profit, etc 			
	Your enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions			
	<ul style="list-style-type: none"> ▶ Mainly other enterprises or institutions 			
2.2.1	Where did the innovations originate	2018/19		
		Yes	No	Do not know
	Tanzania			

	East Africa			
	Rest of Africa			
	Europe			
	America (South/ North)			
	Asia			
	Australia			

2.3	Were any of your goods and service innovations during the year 2018/19 new to your market or new to your firm?	Yes	No
	<p>▶ New to your market? Your enterprise introduced a new or significantly improved good or service onto your market before your competitors (it may have already been available in other markets).</p>		
	<p>▶ Only new to your firm? Your enterprise introduced a new or significantly improved good or service that was already available from your competitors in your market.</p>		

2.4	Using the definition in 1.5 above, please estimate the percentage of your total turnover in 2018/2019	turnover distribution
	▶ Goods and service innovations introduced during 2018/19 that were new to your market	

	▶ Goods and service innovations introduced during 2018/19 that were only new to your firm	
	▶ Goods and services that were unchanged or only marginally modified during 2018/19 Include the resale of new goods or services purchased from other enterprises.	
	Total turnover = 100%	

PART 3: PROCESS INNOVATION

Process innovation is the use or implementation of new or significantly improved process or method for the production or distribution of goods or services or supporting activity. The innovation (new or improved) must be new to your enterprise, but it does not need to be new to your industry sector or market.

It does not matter if the innovation was originally developed by your enterprise or by other enterprises. Exclude purely organisational innovations such as changes in firm structure or management practice impacting on the final product– these are covered in question 10.

3.1	During the year 2018/19, did your enterprise introduce any:		
		Yes	No
	▶ New methods of manufacturing or producing goods or services?		
	▶ Significantly improved methods of manufacturing or producing goods or services?		
	▶ New logistics, delivery or distribution methods for your inputs, goods or service?		
	▶ Significantly improved logistics, delivery or distribution methods for your inputs, goods or service?		
	▶ New supporting activities for your processes, such as maintenance and operating systems for purchasing, accounting or computing?		

	▶ Significantly improved supporting activities for your processes, such as maintenance and operating systems for purchasing, accounting or computing?		
--	---	--	--

3.2	Who developed these process innovations?	Please mark by "X" the single most appropriate option only
	▶ Mainly your enterprise by itself	
	▶ Your enterprise together with other enterprises* or institutions** (* independent enterprises plus other part of your enterprise group (such as subsidiaries, sister enterprises, head office, etc. (**) universities, research institutes, non-profit, etc	
	▶ Your enterprise together with other enterprises or institutions	
	▶ Mainly other enterprises or institutions	

3.2.1	Were any of your process innovations introduced during the year 2018/19 that are new to your market?
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Do not know

PART 4: Ongoing or abandoned innovation activities

Innovation activities include the acquisition of machinery, equipment, software and licenses; engineering and development work, training, marketing and research and experimental development (R&D) [Basic R&D not specifically related to product and/or process innovation should be included] when they are specifically undertaken to develop and/or implement a product or process innovation.

4.1	During the year 2018/19 did your enterprise have any innovation activities to develop product or process innovations that were		
		Yes	No
	▶ Abandoned before completion		
	▶ Still ongoing		

PART 5: The most important and performed innovation activities and expenditures

5.1	During the years 2018/19, did your enterprise engage in the following innovation activities?		
		Yes	No
A	Intramural or in-house Research and Experimental Development (R&D) Creative work undertaken on a systematic basis within your enterprise to increase the stock of knowledge and its use to devise new and improved products and processes (including software development in-house that meets this requirement).		

	If yes, did your firm perform R&D during 2018/19		
		Yes	No
	Continuously?		
	Occasionally?		
B	Extramural or outsourced R&D Same activities as above, but purchased by your enterprise and performed by other companies (including other enterprises within your group) or by public or private research organisations.		
C	1. Acquisition of machinery, equipment and hardware Acquisition of advanced machinery, equipment and computer hardware to produce new or significantly improved products and processes.		
	2. Acquisition of software Acquisition of software to produce new or significantly improved products and processes.		
D	Acquisition of other external knowledge Purchase or licensing or copy of patents and non-patented inventions, know-how, and other types of knowledge from other enterprises or organisations.		
E	Training Internal or external training for your personnel specifically for the development and/or introduction of new or significantly improved products and processes.		
F	Market introduction of innovations Activities for the market introduction of your new or significantly improved goods and services, including market research and launch advertising.		

G	Design Activities to design, improve or change the shape or appearance of new or significantly improved goods or services	
H	Other activities Implementation of new or significantly improved products and process such as feasibility studies, testing, routine software development, tooling up, industrial engineering, etc.	

“Reverse engineering” could also be considered as category

5.2	<p>Please estimate the amount of expenditure for the year 2018/19 only for the first four innovation activities mentioned in 5.1 (A to D) above Include personnel and related costs. <i>Please provide expenditure in thousands of Tshs e.g. Five hundred thousand Tshs and or T.shs 500 000 should be entered as 500 in the box provided: 500,000 = T.shs 500 000.</i> <i>Please leave zeros (000) in the category box if your enterprise had no expenditure</i></p>	<p>STRICTLY CONFIDENTIAL</p> <p>Tanzanian Shillings (T.shs)]</p>
A.	<p>Intramural (in-house) R&D Include labour costs, capital expenditures on buildings and equipment specifically for R&D.</p>	
B.	<p>Acquisition of R&D. Extramural or outsourced R&D.</p>	,000

C.	Acquisition of machinery, equipment and software. Exclude expenditures on equipment for R&D.	,000
D.	Acquisition of other external knowledge.	,000
	Total of these four innovation expenditure categories (A+B+C+D)	,000

5.3	During the years 2018/19, did your enterprise receive any public financial support for innovation activities from the following levels of government? Include financial support via tax credits or deductions, grants, subsidised loans, and loan guarantees. Exclude research and other innovation activities conducted entirely for the public sector under contract.		
		Yes	No
	▶ Regional, District or local municipalities or authorities		
	▶ Central government (URT/RGoZ)		
	▶ National funding agencies		
	▶ Foreign government and/or other foreign public sources (e.g. European Commission)		

PART 6: Sources of information and co-operation for innovation activities

6.1	<p>During the year 2018/19, how important to your enterprise's innovation activities were each of the following information sources? Please identify information sources that provided information for new innovation activities/projects or contributed to the completion of existing innovation activities/projects.</p>						
	<p style="text-align: center;">Information sources</p>			<p style="text-align: center;">Degree of importance Tick the most appropriate answer</p>			
				High	Medium	Low	Not used
	Internal sources	Sources within your enterprise or enterprise group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Market sources	Suppliers of equipment, materials, components or software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Clients or customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Competitors or other enterprises in your sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Consultants, commercial labs or private R&D institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Institutional sources	Universities or other higher education institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Government or public research institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other sources	Conferences, trade fairs, exhibitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Scientific journals and trade/technical publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Professional and industry associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.2	<p>During the year 2018/19, did your enterprise co-operate on any of your innovation activities with other enterprises or institutions?</p> <p>Innovation co-operation is active participation with other enterprises or non-commercial institutions on innovation activities. Both partners do not need to benefit commercially. Exclude pure contracting out of work with no active co-operation.</p>	Yes	No
			If NO, please go to question 7.1

6.3 Please indicate the type of co-operation partner and location.							
	Type of co-operation partner	Tick all that apply.					
		Tanzania	Rest of Africa	Europe	America	Asia	Australia
A.	Other enterprises within your enterprise group	<input type="checkbox"/>					
B.	Suppliers of equipment, materials, components or software	<input type="checkbox"/>					
C.	Clients or customers	<input type="checkbox"/>					
D.	Competitors or other enterprises in your sector	<input type="checkbox"/>					
E.	Consultants, commercial labs or private R&D institutes	<input type="checkbox"/>					

F.	Universities or other higher education institutions						
G.	Government or public research institutes (e.g. Research councils)						

6.4	<p>Which type of co-operation partner was the most valuable for your enterprise's innovation activities?</p> <p>Give corresponding letter from 6.3. For example, clients or customers = 'C'</p>	
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PART 7: Effects/Objectives of innovation during 2018/19

7.1	How successful were each of the following types of outcomes for your products (goods or services) and process innovations introduced during the year 2018/19					
	Outcomes/Effects		Level of success of outcomes Tick the most appropriate answer			
			High	Medium	Low	Not relevant
	Product oriented effects	Increased range of goods or services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Entered new markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Increased market share	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Improved quality of goods or services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Process oriented effects	Improved flexibility of production or service provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Increased capacity of production or service provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Reduced production costs per unit of labour, materials, energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Other effects	Reduced environmental impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Improved working conditions on health and safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Met governmental regulatory requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.2	How important were each of the following objectives for your products (goods or services) and process innovations introduced during the year 2018/19?				
	Objectives	Importance of objectives Tick the most appropriate answer			
		High	Medium	Low	Not relevant
	Increase range of goods or services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Replace outdated products or processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Enter new markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Increase market share	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Improve quality of goods or services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Improve flexibility for producing goods or services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Increase capacity for producing goods and services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Reduce production (labour, materials, energy) costs per unit output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Improve working conditions on health and safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART 8: Factors hampering innovation activities

8.1	During the year 2018/19 , were any of your innovation activities or projects:	Yes	No
	▶ Abandoned in the concept stage		
	▶ Abandoned after the activity or project was begun		
	▶ Seriously delayed		

QUESTIONS 8.2, 9 AND 10 TO BE ANSWERED BY ALL ENTERPRISES:

8.2	During the year 2018/19, how important were the following factors in hampering your innovation activities or projects or influencing a decision not to innovate?			
	Hampering factors	Degree of importance Please also indicate particular factors that were not experienced.		
		High	Medium	Low

	Cost factors	Lack of funds within your enterprise or group				
		Lack of finance from sources outside your enterprise				
		Innovation costs too high				
		Excessive perceived economic risks				
	Knowledge factors	Lack of qualified personnel				
		Lack of information on technology				
		Lack of information on markets				
		Difficulty in finding co-operation partners for innovation				

		Market dominated by established enterprises				
	Market factors	Uncertain demand for innovative goods or services				
		Innovation is easy to imitate				
	Environmental factors	Drought, floods, diseases, etc				
	Other factors	Organisational rigidities within the enterprise				
		Insufficient flexibility of regulations or standards				
		Limitations of science and technology public policies				

	No need to innovate	No need due to prior innovations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		No need because of no demand for innovations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART 9: Intellectual property rights

9.1	During the year 2018/19, did your enterprise	Yes	No
	▶ Secure a patent in Tanzania?		
	▶ Apply for a patent outside of Tanzania		
	▶ Register an industrial design?		
	▶ Register a trademark?		
	▶ Claim copyright?		
	▶ Grant a licence on any intellectual property rights resulting from innovation?		

PART 10: ORGANISATIONAL AND MARKETING INNOVATION

An organisational innovation refers to the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations (Oslo M., paragr. 177) in firm structure or management methods that are intended to improve your firm's use of knowledge, the quality of your goods and services, or the efficiency of work flows.

A marketing innovation is the "Implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing" (Oslo M., paragr. 169) or sales methods to increase the appeal of your goods and services or to enter new markets.

10.1	During the year 2018/19, did your enterprise introduce:		
	Organisational innovations	Yes	No
	<ul style="list-style-type: none"> ▶ Business practices: New business practices for organising procedures (i.e. supply chain management, business reengineering, knowledge management, lean production, quality management, etc) Exclude routine upgrades. 		
	<ul style="list-style-type: none"> ▶ Work responsibilities and decision making: New methods of organising work responsibilities and decision making (i.e. first use of a new system of employee responsibilities, team work, decentralisation, integrating/de-integrating different departments or activities, education/training systems) 		

	<ul style="list-style-type: none"> ▶ External relations: New methods of organising external relations with other firms or public institutions (i.e. first use of alliances, partnerships, outsourcing or sub-contracting, etc) 		
--	--	--	--

10.2	Marketing innovations	Yes	No
	<ul style="list-style-type: none"> ▶ Significant changes to the aesthetic design or packaging of a good or service (exclude changes that alter the product's functional or user characteristics – these are product innovations) 		
	<ul style="list-style-type: none"> ▶ New media or techniques for product promotion (i.e. the first time use of a new advertising media, a new brand image, introduction of loyalty cards, etc) 		
	<ul style="list-style-type: none"> ▶ New methods for product placement or sales channels (i.e. first time use of franchising or distribution licenses, direct selling, exclusive retailing, new concepts for product presentation, etc) 		
	<ul style="list-style-type: none"> ▶ New methods of pricing goods or services (i.e. first time use of variable pricing by demand, discount systems, etc) 		

10.3	If your enterprise introduced an organisational innovation during the year 2018/19 please tick how important were each of the following results or effects?				
	Results	Degree of importance			
		High	Medium	Low	No results
	▶ Increased or maintained market share				
	▶ Reduced time to respond to customer or supplier needs				
	▶ Improved quality of your goods or services				
	▶ Reduced costs per unit output				
	▶ Improved employee satisfaction and or reduced rates of employee turnover				

PART 11: SPECIFIC INNOVATIONS BY YOUR ENTERPRISE

11.1	During the year 2018/19, were any of your new or significantly improved specific products or processes:	Yes	No	Don't know
	▶ A first in [Tanzania]?			
	▶ A world first?			
	▶ New or significant changes in your external relations with other firms or public institutions, such as through alliances, partnerships, outsourcing or sub-contracting			

11.2	If your answer to Question 11 was yes then please give short descriptions of these innovations (or attach separate pages or promotional brochures)
------	--

11.3	Please list other significant examples of innovations in your enterprise in the year 2018/19 (or attach separate page or promotional brochures etc)
------	---

Please return your completed questionnaire to NBS/OCGS and keep a saved copy of this questionnaire for your records and internal use, which may also be referenced if we need to follow-up with any specific issues.

THANK YOU FOR YOUR TIME AND EFFORT

Name of Interviewer: _____ Signature: _____ Date: _____

Name of Supervisor: _____ Signature: _____ Date: _____

MODULE 3: RESEARCH AND DEVELOPMENT EXPENDITURE

THE FOLLOWING DEFINITIONS ARE IMPORTANT IN THE COMPLETION OF THE SURVEY QUESTIONNAIRE: WHAT IS R&D	
<p>Definition</p> <p>This survey follows the approach of the Organisation for Economic Co-operation and Development (OECD) as adopted in 2007 during the first meeting of the African Inter-Governmental Committee on Science, Technology and Innovation Indicators in Maputo (Mozambique). It defines Research and Experimental Development (R&D) as:</p> <ul style="list-style-type: none"> ▶ Research is creative work and original investigation undertaken on a systematic basis to gain new knowledge, including knowledge of humanity, culture and society. ▶ Experimental development is the application of research findings or other scientific knowledge for the creation of new or significantly improved products, services or processes. 	<p>R&D Includes – but is not limited to:</p> <p>Activities of personnel who are obviously engaged in R&D. In addition, include:</p> <ul style="list-style-type: none"> ▶ The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D ▶ Management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support to those performing R&D ▶ Software development where the aim of the project is the systematic resolution of a scientific or technological uncertainty ▶ Research work in the biological, physical and social sciences, and the humanities

The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned.

Examples:

Investigating electrical conduction in crystals is basic research; application of crystallography to the properties of alloys is applied research.

New chip designs involve development.

Investigating the limiting factors in chip element placement lies at the border between basic and applied research, and increasingly involves nanotechnology.

Much services R&D involves software development where the completion of the project is dependent on a scientific or technological advance and the aim of the project is the systematic resolution of a scientific or technological uncertainty.

Scope of survey

- ▶ The survey requests data performed IN-HOUSE by your organisation on the national territory of Tanzania
- ▶ Part five asks some questions on “out-sourced R&D”

- ▶ Social science research including economic, cultural, educational, psychological and sociological research
- ▶ Research work in engineering and the medical sciences
- ▶ R&D projects performed for other parties
- ▶ “Feedback R&D” directed at solving problems occurring beyond the original R&D phase, for example technical problems arising during initial production runs.

R&D Excludes:

The following ROUTINE activities are excluded , except where they are an essential part of in-house R&D activity:

- ▶ Scientific and technical information services
- ▶ Engineering and technical services
- ▶ General purpose or routine data collection
- ▶ Standardisation and routine testing
- ▶ Feasibility studies (except into R&D projects)
- ▶ Specialised routine medical care, for example routine pathology services
- ▶ The commercial, legal and administrative aspects of patenting, copyrighting or licensing activities
- ▶ Routine computer programming, systems work or software maintenance where there are no technological uncertainties to be resolved.

- ▶ In-house R&D refers to R&D performed by the reporting unit on its own behalf or on behalf of the others.
- ▶ It excludes R&D projects funded by this organisation but carried out by others using their own facilities.
- ▶ In-house R&D must be distinguished from outsourced R&D which should be reported under Part 5.
- ▶ Only R&D performed in Tanzania should be recorded

Authority

The National Bureau of Statistics (NBS) and Office of Chief Government Statistician of Zanzibar (OCGS) are mandated to conduct the survey of inputs into Research and Development (R&D) for the Tanzania Commission for Science and Technology (COSTECH), under the Ministry of Education, Science and Technology (MEST). The survey is a component of Official Statistics, as defined in the Statistics Act 2015. As such, organizations are legally required to respond to this request for data.

Purpose of the Survey

The R&D survey collects data on the inputs into R&D activities performed IN-HOUSE in Tanzania by all organisations (including Business, Government, Not-for Profit and Higher Education). The data is used for planning and monitoring purposes and for measuring international competitiveness

Scope

The statistical unit for the survey is R&D, Higher Learning Institutions and Industry, both government and private owned.

Confidentiality

All data gathered in this survey is confidential. Only the survey team will have access to the information. Raw data gathered from this survey will never be disclosed and will remain confidential except when an organization consents upon a formal request.

DUE DATE

Kindly complete and return this questionnaire to NBS / OCGS

DETAILS OF PERSON COMPLETING THE QUESTIONNAIRE:

Name (with title)	
Designation	
Date	
Sign	

Tel	
Fax	
Cell	
E-mail	

2.0 Contact Person filled the questionnaire _____

Department _____ Email address _____

Mobile Number _____

Period of reporting (Last Financial year e.g 2018/2019):

3.0 Total number of employees working for the organisation during reported financial year (include staff on contract for six months or longer)	
--	--

4.0 Did the reporting organisation/unit perform any IN-HOUSE R&D in Tanzania during the 2018/19 financial year?

(Please tick)

- YES Please continue with Part 2
- NO Please proceed to Part 5
- If your reporting organization /unit does not do any In-House and/or Outsourced R&D, please tick this box and return the questionnaire

PART 2: IN-HOUSE R&D EXPENDITURE

2.1. ALLOCATE IN-HOUSE R&D EXPENDITURE AS FOLLOWS

(Specific year)

CAPITAL EXPENDITURE ON R&D

- ▶ The full price of capital expenses must be reported in the year of purchase (do not depreciate)
- ▶ If the asset has been/will be used for more than one activity, include only an estimate of the portion used for R&D. For example, a new laboratory that will be used for R&D (included), testing (excluded) and quality control (excluded). For instance, if the intended use of this new laboratory for R&D purposes maybe 40% of the total usage (ie. the other 60% for other activities), only 40% of the total construction cost of the building should be considered as the relevant R&D expenditure.

Including - but not limited to:

- ▶ Expenditure on fixed assets used in the R&D projects of your business.
- ▶ Acquisition of software, including fees, expected to be used for more than one year.
- ▶ Purchase of databases expected to be used for more than one year.
- ▶ Major repairs and improvements on land and buildings

Excluding:

- ▶ Other repairs and maintenance expenses
- ▶ Depreciation provisions.
- ▶ Proceeds from the sale of R&D assets.

		Local currency. '000 (Excl. VAT)
A: Movable Asset		
Vehicles,		
Plant		
Machinery		
Equipment		
Other Assets		
TOTAL	A	
B: Fixed Asset		
Land;		
Buildings		
Other structures		
TOTAL	B	

LABOUR COSTS OF R&D PERSONNEL

		Local currency. '000 (Excl. VAT)
Labour Costs of R&D personnel (To match with Question 6.3)		
Total Costs of Student (from Question 6.5) this should be checked		
TOTAL	C	

OTHER CURRENT EXPENDITURE ON R&D

Including - but not limited to:

- ▶ Materials, fuels and other inputs.
- ▶ Water, electricity and other overheads expenses
- ▶ Repair and maintenance expenses.
- ▶ Payments to outside organisations for use of specialised testing facilities.
- ▶ Payments to outside organisations for analytical work, engineering or other specialised services in support of R&D projects carried out by this department/unit
- ▶ Commission/consultant expenses for research projects carried out by this department/unit
- ▶ Other R&D expenses and indirect costs not classified in 7A, 7B or 7C.
- ▶ The relevant % of labour costs of persons providing indirect services such as Head office, HR, Finance, security, maintenance personnel, staff of central libraries, IT departments

Excluding:

- ▶ Contract R&D expenses where the research project is carried out elsewhere by others on behalf of this department/unit.
- ▶ Payments for purchases of technical know-how.
- ▶ Payments for patent searches.
- ▶ Depreciation provisions.

		Local currency. '000 (Excl. VAT)
Other Current Expenditure	D	

		Local currency. '000 (Excl. VAT)
TOTAL R&D EXPENDITURE (A + B + C + D = E)	E	

2.2 SOURCES OF FUNDS FOR IN-HOUSE R&D

Provide a breakdown of the total R&D expenditure according to sources of funds.

Organisation	Local currency. '000 (Excl. VAT)
Own funds	

Government (includes URT, RGoZ, COSTECH, other Government Departments and Institutes)

	Local currency. '000 (Excl. VAT)
Innovation Grants	
Research grants	
Contracts/consultancy to perform R&D	
Personal Emoluments (including salaries and allowances)	
Other Charges	
Development (including any investment to support working environment such as renovations of buildings and staff)	

Business

Business (Domestic only) (goods or services provided)	
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Other Sources

Not For Profit Organisations (including foundations)	
Individual Donations	
Higher Education (funds received for R&D)	

Foreign

Innovation Grants	
Research grants	
Contracts/consultancy to perform R&D	
Personal Emoluments (including salaries and allowances)	
Other Charges	
Development (including any investment to support working environment such as renovations of buildings and staff)	

	Local currency. '000 (Excl. VAT)
TOTAL R&D EXPENDITURE (should match total from Question 1E)	

PART 3: CATEGORIES OF IN-HOUSE R&D EXPENDITURE

3a. IN-HOUSE R&D EXPENDITURE BY TYPE OF R&D

Specify the percentage of; a). IN-HOUSE TOTAL R&D expenditure (both current costs and capital expenditure) by type of R&D, and b). Total IN-HOUSE R&D CURRENT expenditure (labour costs and other current costs) by type of R&D.

Basic Research

- ▶ Work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without a specific application in view
- ▶ Analyses of properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws.
- ▶ The results of basic research are usually published in peer-reviewed scientific journals

A. Based on Total In-tramural expenditure (Percentage)
2018/19

B. Based on only Current expenditure (Percentage)
2018/19

Applied Research

<ul style="list-style-type: none"> ▶ Original investigation to acquire new knowledge with a specific application in view. ▶ Activities that determine the possible uses for the findings of basic research. ▶ The results of applied research are intended primarily to be valid for a single or limited number of products, operations, methods, or systems. ▶ Applied research develops ideas into operational form. ▶ Information or knowledge derived from applied research may be published in peer-reviewed journals or subjected to other forms of intellectual property protection. 	<p>a). Based on Total Intramural expenditure (Percentage)</p>	<p>b). Based on only Current expenditure (Percentage)</p>
	2018/19	2018/19

Experimental Development

<ul style="list-style-type: none"> ▶ Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed. 	<p>a). Based on Total Intramural expenditure (Percentage)</p>	<p>b). Based on only Current expenditure (Percentage)</p>
	2018/19	2018/19

TOTAL		
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3b. Classify R&D with associated percentage expenditure

Appendix A provide international standard on the NOMENCLATURE FOR THE ANALYSIS AND COMPARISON OF SCIENTIFIC PROGRAMMES AND BUDGETS (NABS)

Donor/Funder/source of fund	Description of the project based on appendix B (make sure you refer to appendix)	Estimated percentage expenditure out of the total reported in question 2
Total		

*Not always, the total reaches 100%

PART 4: R&D OUTSOURCED / CONTRACTED OUT

Outsourced R&D refers to:

- ▶ Outsourced or extramural expenditures are the amounts an organization paid or committed to pay to another organization for the performance of R&D during a specific period.
- ▶ This includes acquisition of R&D performed by and/or grants given to other organizations for performing R&D

	Local currency'000 (Excl. VAT)
4.1. State value of R&D outsourced inside Tanzania	

	Local currency'000 (Excl. VAT)
4.2. State value of R&D outsourced outside Tanzania	

4.3. If the amount stated in question 4.1 and 4.2 is in excess of 100 million (Tsh.), please indicate the name of the organisation that received payment, the approximate payment made for the performance of R&D and the associated expenditure.

State details of R&D outsourced inside Tanzania

Outsourced to:	Approximate Value Tsh. '000 (excl. VAT)

State details of R&D outsourced outside Tanzania

Outsourced to:	Approximate Value Tsh.'000 (excl. VAT)

PART 5: R&D OUTPUTS

5.1 Did the reporting organization/unit perform any R&D in partnership with industry or any other productive sector?

Yes	
No	

If yes specify which sector?

5.2 Has your research contributed to the attainment of MKUZA III (2016-2020) /FYDP (2015-2020)/ SDG

Key objectives/goals of MKUZA III/FYDP/SDG	Please state how and give examples

5.3. What constraints do you face in your research work?

5.4. Please give suggestions on how to improve your research outputs.

THANK YOU FOR YOUR TIME AND EFFORT

Name of Interviewer: _____ Signature _____ Date _____

Name of Supervisor: _____ Signature _____ Date _____

**MODULE 4:
INFORMATION OF INDIVIDUAL RESEARCHERS**

DETAILS OF PERSON COMPLETING THE FORM

Title: _____

Gender (Male/ Female) _____

Age

- ▶ Below 29 years
- ▶ 30 – 39 years
- ▶ 40–49years
- ▶ 50 - 59 years
- ▶ 60 and above

4. Highest level of Education (tick where appropriate)

- ▶ First Degree (BSC/BA)
- ▶ Post graduate diploma
- ▶ Masters / MPhil
- ▶ PhD
- ▶ Post Doc

5. What is your field of specialty? (Insert the initial in Q.5 where appropriate)

AGRICULTURE SCIENCES		NATURAL SCIENCES		ENGINEERING AND TECHNOLOGY	
Crop science		Mathematics		Civil engineer- ing	
Animal science		Computer and information sciences		Electrical engi- neering,	

Forestry		Physical sciences		
Fisheries		Chemical sciences	Information engineering	
Animal and Dairy science		Earth and related Environmental sciences	Mechanical engineering	
Veterinary science		Biological sciences	Chemical engineering	
Agricultural biotechnology		Other natural sciences	Materials engineering and Sciences	
Others				
MEDICAL AND HEALTH SCIENCES		SOCIAL SCIENCES	Environmental engineering	
Basic medicine		Psychology	Environmental biotechnology	
Clinical medicine		Economics and Business	Industrial biotechnology	
Health sciences		Educational sciences	Informatics	
Health biotechnology		Sociology	Other engineering and technologies	
Other medical sciences		Law	HUMANITIES	
		Political science	History and Archaeology	
		Social and economic geography	Languages and Literature	

		Media and communications		Philosophy, Ethics and Religion	
		Other social sciences		Arts (arts, history of arts, performing arts, music)	
				Other humanities	

6. Are you currently working in your field of specialty? YES _____ NO _____

If NO, why? _____

7. For how long have you been working in this field? _____

8. Do you conduct research as part of the terms of your current employment? (Yes/No)

9. In the past twelve months how many months/days did you spend on research?

10. What is the range of your gross monthly pay? (Tick where applicable)
Less than 1 million

- i. million to 2 million
- ii. million to 3 million
- iii. million to 4 million
- iv. million to 5 million
- v. million and above

11. Number of publications published within the last 5 years (attach separate template for this) _____

12. Number of patents and other intellectual property applied/received within the last 5 years (attach separate template for list) _____

13. Number of collaborative research projects under your leadership within the last 5 years (attach separate template for list)

14. Number of research grants that you have attracted in the past 5 years as PI or Co PI (attach separate template for list)

15. Mention the total amount of funding attracted in the past 5 years

THANK YOU FOR YOUR TIME AND EFFORT

Name of Interviewer: _____ Signature _____ Date _____

Name of Supervisor: _____ Signature _____ Date _____

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