
The United Republic of Tanzania
Ministry of Higher Education, Science and Technology



**A FINAL DRAFT
ON NATIONAL RESEARCH POLICY**

VOLUME II

April 2007

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ABBREVIATIONS AND ACRONYMS

AICAD	African Institute for Capacity Development
COSTECH	Commission for Science and Technology
CTBTO	Comprehensive Nuclear Test-Ban Treaty Organisation
GDP	Gross Domestic Product
HR	Human Resources
IAEA	International Atomic Energy Agency
ICGEB	International Centre for Genetic Engineering and Biotechnology
ICT	Information Communication Technology
IPR	Intellectual Property Rights
MDGs	[United Nations] Millennium Development Goals
MTAs	Material Transfer Agreements
NRA	National Research Agenda
NSGRP or [MKUKUTA]	National Strategy for Growth and Reduction of Poverty or [Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania]
R&D	Research and Development
STI	Science, Technology and Innovations
SMEs	Small and Medium Enterprises

1.0 INTRODUCTION

1.1 Background

Research plays a very crucial role in the socio-economic development of any society. It is a process of systematic enquiry that leads to construction of knowledge of importance and consequence to societal development. The main goal of research is to serve as an instrument of change to improve people's living standards by stimulating growth and increased productivity in critical productive sectors of the economy. It can lead to spin-off of new firms, creation of more competitive products and services in a country for the world markets, improvement of quality of people's life thereby increasing life expectancy, enhanced food productivity and security and shelter, among many other benefits. At the level of enterprises, research can bring about product innovations, product improvement, increased service efficiency, effectiveness and improved performance in the market place.

1.2 Situational Analysis of Research in Tanzania

Much as there have been a number of research activities carried in Tanzania in different areas such as agriculture, livestock, energy, medical etc. most of them are those driven by the agendas of various external donor agencies without taking into account the country's development policy and the problem needs of the society. There is low interest by the Tanzanians to invest in research activities due to failure to realise the potential returns. Further, governance, research management culture and funding of research activities are weak, fragmented, and bureaucratic and do not encourage, nor do they enable researchers to carry out meaningful research activities. Furthermore, researchers have not been materially rewarded through outputs derived from their research results partly due to lack of the requisite policy framework for such public recognition as well as poor marketing strategies and protection of their intellectual property rights.(More data will be added before this paragraph)

In order to facilitate enhanced research performance within a clear national framework, a well-articulated research policy that will match the realities of the 21st century has to be formulated. The policy provides guidance on national research management, undertaking

of research and research performance evaluation. It will also guide research capacity building in order to exploit the national and other resources efficiently for socio-economic advancement.

2.0 RATIONALE FOR THE NATIONAL RESEARCH POLICY

Sustainable developments require evidence-based knowledge (research results) and transfer the same into tangible products, processes and services for socio-economic development. The satisfaction of the above requirements necessitates establishment of a national research policy to guide stakeholders on effective research undertaking and efficient resources utilization in the country. This could be achieved in terms of strengthening and improvement of research to continuously address quality and relevance with respect to the problems and needs of the society. The policy shall assist in strengthening the country's research capacities and capabilities so as to bring about enhanced national productivity and increased competitiveness in a continually globalised world economy. The policy being the first of its kind in Tanzania, assumes the responsibility for providing guidelines on how a nationally-relevant, development-focussed research effort is to be conducted in all sectors of the economy. The policy addresses among other things the following critical areas:

(a) National Research and Development Agenda: National development needs ought to be harmonized and prioritized at societal level so that national research teams could be formed and funded centrally in pursuit of nationally perceived solutions. Most research activities are apparently driven by the agenda of various funding sources be it external or local. Such activities do not adequately address the country's development agenda and the needs of the society. This therefore calls for establishment of multi-disciplinary research teams that would prioritise national research and development agenda for short-, medium- and long-term articulation.

(b) Research Funding: Funding is one of the critical components for successful and effective research activities in a country. However, a research undertaking is expensive requiring heavy investment for a longer time before its impacts are appreciated by the society. In order to be able to address issues of national priorities, allocation of funds for research from internal sources are of paramount importance.

Funding of research is one of the major problems in the country due to the very limited financial resources that are available to research and development institutions and to individual researchers. In 2003/04 research funding amounted

to about 0.012% of GDP as compared to 1% of GDP proposed in the 1996 National S&T policy and SADC countries. The above figure is far below that of South Africa, which was 0.81% and 2.76% in the United States of America for the same year.

A holistic funding mechanism for research is necessary for sustained research effort. A holistic approach entails a well-coordinated research fund facility that takes on board national priority areas with equitable access. Research funding is uncoordinated and fragmented and without focus on priority national development issues. Further, there are neither incentives for the private sector participation in funding research and development activity in Tanzania nor an effective form of public recognition or appreciation.

- (c) **Human Resource Base:** There is inadequate human resource capacity base in most fields in terms of both quality and quantity for effective participation in the national research activities. Available data indicates that there were only 13 research personnel for every 10,000 persons in Tanzania in 2006 compared to Kenya, in South Africa, and for Japan,, Sweden There is also limited capability and experience in converting research results into useful processes, products and services.
- (d) **National Research Support Environment:** Research activities are slow in producing tangible results. When subjected to resource-constrained environment, there is tendency to marginalize its importance and support from the Government and public authorities as well as the private sector. With continued marginalization, development opportunities emanating from research results can never be realised. There is need therefore to create a conducive national research environment to ensure that national development is research driven.
- (e) **A Comprehensive Research Management System:** The existing research management mechanisms in place are inadequate for effective and sustained planning, monitoring and evaluating research activities in the country. Further, research activities are conducted in isolation and the research results are not adequately documented and publicised. A comprehensive research management system is necessary to ensure well-focused and effective research that addresses national priority needs.

- (f) **Partnership between research institutions and industry:** Effective application of research results requires strong linkage between research institutions and industry. Currently, there is insufficient partnership between research institutions and the private sector (industry) in development of joint research programmes with practical application to the technical and business problems facing the nation/industry/private sector. Socio-economic development depends to a large extent on aligning the flow of knowledge to knowledge-supply chains aimed at enhancing value of processes, products and services. There is need therefore to focus on demand-driven research and to encourage researcher interaction with economic situations and problem-solving alternatives.
- (g) **Multi-disciplinarity in Research:** There is insufficient cross-disciplinary collaboration or multiple cultural perspectives that require more than one skill. Experiences from other countries have shown that most renowned research results emerge from cross-disciplinary collaboration or multiple cultural perspectives that requires more than one skill to realistically solve problems. There is therefore a need for different institutions and individual researchers to collaborate in research including the commercialization.
- (h) **Environment for Protection of Intellectual Property Rights (IPR) and Patents:** Limited awareness of IPR and the absence of an enabling environment including the non-use of patents in research activities among academicians and industrialists affect research in terms of its economic contributions and the value added in new products and processes, licenses with royalties. Through effective use of IPR, ideas that emerge from research carried at universities and other research institutions, which are ripe for commercial exploitation, ought to be allowed to develop and flourish in a protected environment before being subjected to the rigours of full competition. If the outcome is successful, it is imperative that any IPR should be adequately protected before commercial exploitation.
- (i) **Regional and International Cooperation and Partnerships:** There is limited exploitation of opportunities emanating from various regional and international collaborative frameworks. These collaborations range from regional to bilateral and include international organisations and agencies. For example, the Government has benefited much on capacity building from bilateral cooperation with the Swiss Government and other multilateral organisations such as the Sida-SAREC, World Bank, African Institute for Capacity Development (AICAD), Rockefeller

Foundation, International Atomic Energy Agency (IAEA), the Comprehensive Nuclear Test-Ban Treaty Organisation (CTBTO) and the International Centre for Genetic Engineering and Biotechnology (ICGEB). However, much more co-operation is yet to be evidenced with many other regional and international organisations in order for the nation to reap maximum benefits from such collaborations.

- (j) **Mainstreaming of Environmental Concerns:** Research activities need to be compliant with the environmental laws and regulations in the country. There is a need to mainstream environmental concerns in all research activities in the country.
- (k) **Information Management System** *Research conduct requires strong information and communication system. There is inadequate investment in ICT infrastructure at micro- and macro-levels, coupled with low levels of human resources—in terms of numbers and qualifications—to utilise ICT in research. Consequently, many researchers are unable to access most journals available online to facilitate research activities. There need to put in place a strong communication system so as to fully deploy researchers in exploiting world wide information.*
- (l) **Research Performance and Quality Assurance System:** To ensure research effectiveness, performance monitoring and quality assurance system has to be in place. There exists neither institutional nor national mechanism for assessing research performance by stakeholders in the country. There is also lack of research performance indicators aimed at ensuring quantifiable outputs in terms of how research addresses issues relevant to national or societal needs as well as that of advancement of academic knowledge or the state of knowledge.
- (m) **Research Ethics:** Conduct of research requires sound ethical framework. Research in Tanzania has weak scientific merits in terms of justification/rationale for conducting it; lacks soundness and clarity of the objectives and methodologies to be employed. There is also an inequitable sharing of research benefits, particularly between foreign and local researchers/institutions/research communities. Institutional Memoranda of Understanding (MoU) between collaborating institutions/countries; review committees at the institutional level; legal frameworks such as IP policies and Materials Transfer Agreements (MTAs) at both institutional and national levels are necessary in ensuring and enforcing adherence to research ethics.

3.0 NATIONAL RESEARCH POLICY FRAMEWORK

The Tanzania National Research policy framework is guided by Vision and Mission statements that are commensurate to the research needs of Tanzania.

3.1 Vision

Tanzania aspires to a national development breakthrough that will evolve from research-based processes and services geared towards higher productivity in all sectors of national development.

3.2 Mission

Tanzania shall adopt and embrace values that subscribe to an unrelenting pursuit of issues and knowledge through methods and culture of scientific enquiry, strategic research, education and training that enhance equitable and sustainable processes of socio-economic production for national development.

3.3 General Objectives

The general objective of the National Research Policy is to provide guidance to researchers, the public and private sector, as well as development partners in national research needs for socio-economic development in line with present and future development goals.

3.4 Policy Issues, Objectives and Policy Statements

In the light of the Vision and Mission presented above and of the decision to formulate a National Research Policy, the following eleven focal areas of policy have been identified for articulation:

- (i) National Research Agenda;
- (ii) Legal and Regulatory Framework;
- (iii) Research Management System;
- (iv) Funding;
- (v) Human Resource Development and Facilities;
- (vi) Strategic Collaboration and Partnership (national, regional and international);
- (vii) Information Management System;

- (viii) Gender;
- (ix) Ethics.

In the context of these areas of concern, challenges have been identified, policy statements articulated and strategies to address the same specified.

3.4.1 National Research Agenda (NRA)

(a) Policy Issue

The need to attain innovations and improvements in all key sectors of the economy including agriculture and food security, energy, natural resources, health, infrastructure, industrial production, human resources in science, technology and innovation, trade as well as environmental protection must be governed by a national priority setting process. In recognition of the meagre human and financial resources available, priority must be given to those activities that hasten national development by reducing poverty.

(b) Policy Objectives

- (i) Setting up priority areas for the national research in relevant sectors of the economy and periodically reviewing the same.
- (ii) Providing improved goods, processes and services from research results for improved social services and hence socio- economic development.

(c) Policy Statements

The following are policy statements prioritizing the national research for relevant sectors:

The Government through the coordinating body shall:

- (i) Set short, medium and long-term research priorities in line with the national socio-economic development agenda.
- (ii) Provide support and facilitate research activities that are demand driven and adhere to national priorities.

3.4.2 Legal and Regulatory Framework

(a) Policy Issue

There are a number of challenges and policy issues that require a comprehensive legal and regulatory framework to be resolved. Currently, there is need put in place a legal and

regulatory framework to ensure enhanced research activity, effective coordination, dissemination of research findings, monitoring and evaluation of research activities at national level. National research advisory mechanism is unclear and ineffective.

(b) Policy Objectives

To address these challenges, the objectives of the policy include the following:

- (i) Enhancing effective coordination of research institutions in the country and their accountability;
- (ii) Reconstituting the organisational structure and responsibilities (terms of reference) of the coordinating body in pursuit of more effective and binding national coordination of research institutions; and
- (iii) Introducing and sustaining a regular monitoring and evaluation (M&E) system for research institutions at national level.

(c) Policy Statements

In the light of these objectives,

- (i) The Government shall provide clear legal mandate to a research coordinating body to coordinate, promote, regulate; regularly monitor, evaluate and demand accountability for research and development performance of research in the country.
- (ii) The national coordinating body shall play an advisory role on all matters pertaining to research in the country.

3.4.3 Research Management System

(a) Policy Issue

The current coordination of research activities is no longer in line with the on-going public service reforms and external environment as affected by globalisation. *There is lack of formal linkage between the coordinating body and research institutions in overseeing research activities coupled with inadequate national database.*

(b) Policy Objectives

- (i) Ensuring the undertaking of research that is aligned with NRA that is research planning, monitoring and reporting.

- (ii) Ensuring the alignment of research governance structures.
- (iii) Facilitating the availability of adequate funds from various sources for implementation of research activities in line with NRA.
- (iv) Guaranteeing availability of the physical and human resources for implementation of research activities.

(c) Policy Statements

In order to ensure an effective and efficient research management system, the *Government shall*:

- (i) Put in place appropriate institutional framework that is legally supported so as to improve efficient and effectiveness of research, coordination and development management system as well as ensuring public ownership of the NRA.
- (ii) Facilitate and/or support the preparation and undertaking of research that focuses on the NRA;

3.4.4 Funding

(a) Policy Issue

Despite the recognition of the need to invest in research, and the government pronouncement to allocate at least 1% of the GDP to research programmes, national funding has continued to be extremely low and research activities are largely donor-driven. Available data indicate that research funding to research institutions to support research programmes was about 0.012% of the GDP as of 2003/04 fiscal year. Consequently, there is hardly research addressing the national development agenda. Contribution to research funding by the private sector remains dismal. Further, researchers are not rewarded for their achievements/contributions and are poorly remunerated. There is therefore a need to translate the government pronouncements into concrete actions.

(b) Policy Objectives

- (i) Committing the government and the private sector to providing adequate funding for research.
- (ii) Motivating researchers and institutions to excel in research as well as rewarding exemplary individual researchers and research institutions.
- (iii) Motivating private sector/industry to contribute to research funding.

(c) Policy Statements

The Government shall:

- (i) Allocate not less than 1% of GDP annually for research activities.
- (ii) Support and facilitate initiatives aimed at raising funds from alternative sources including setting up a mechanism for motivating the private sector and development partners to contribute towards research funding.
- (iii) Establish a mechanism for motivating and rewarding research performance both at institutional and individual levels.

3.4.5 Human Resource Development and Facilities

(a) Policy Issue

At the moment, a comprehensive research human resources database does not exist. HR is inadequate and also underutilised with most competent staff being engaged in administrative responsibilities in their institutions. Further, there is significant brain drain due to poor remuneration, incentive and unsatisfactory working environment. There are neither HR targets set in line with NRA, nor comprehensive succession plans to address staff attrition (retirements, demise, exodus, etc). Facilities for research leave much to be desired both in quantity and quality. The majority of research institutions do not have optimal research staff-mix and there is little research is multi-disciplinary. Teamwork culture is weak. Researchers have insufficient strategic international exposure.

(b) Policy Objectives

- (i) Establishing a sustained human resource research capacity to address national research needs and ensuring that the capacity is fully utilised;
- (ii) Setting out clear guidelines with respect to research staff qualifications and mix in terms of both qualification and seniority;
- (iii) Establishing a mechanism to support teamwork and multi-disciplinarity in research;
- (iv) Updating and expanding researcher skills continually through *strategic international exposure and linkages* and;
- (v) Establishing an adequate outlay of facilities and equipment for research.

(c) Policy Statements

The Government shall:

- (i) Set targets for human resource and programmes for building research capacity and capabilities to address national needs.
- (ii) Promote and support institutional and organizational set-up that enhance teamwork and multi-disciplinarity in research;

3.4.6 Strategic Collaboration and Partnership

(a) Policy Issue

There has been weak strategic partnership and collaboration between the government, research institutions and the private sector in the country. The same applies to partnership and collaboration among various stakeholders at national, regional and international levels. As a result, the country has missed out on critical opportunities, such as capacity building in terms of human resources and facilities; rational utilisation of resources; and transfer of knowledge, technology and materials.

(b) Policy Objectives

Nurturing, enhancing, encouraging and sustaining active engagement and collaboration between:

- (i) Research institutions, private sector and the government.
- (ii) The national research coordinating body, other regional and international coordinating bodies and research institutions.

(c) Policy Statements

The Government shall:

- (i) Promote linkage, collaboration partnerships and working relationships between research institutions, private sector/industry, central and local government authorities in Tanzania.
- (ii) Seek and negotiate with the regional and international research commissions and institutions for purposes of sharing knowledge, resources and experiences.

3.4.7 Information Management System

(a) Policy Issue

Several bottlenecks associated with research management system in Tanzania include inadequate of database on research activities, inputs, outputs and impacts to the society; mechanism for dissemination of research output to the society, sharing information by research institutions, individual researchers and other bodies on research programmes. There is also low investment in ICT infrastructure at macro and micro levels coupled with low levels of human resources with ICT skills, in terms of numbers and qualifications to manage the research systems. Most researchers are unable to access most journals online due to inadequate ICT infrastructure and subscriptions.

(b) Policy Objectives

- (i) Sustaining an effective research management system that shall facilitate sharing of research information by research institutions, individual researchers and other bodies.
- (ii) Creating an enabling environment by maximising exploitation of ICT, exchange of research results as well as implementation of an efficient research management system.
- (iii) Maintaining sufficient human resources in terms of numbers and qualifications to manage ICT for research management;

(c) Policy Statements

The national research coordinating body shall:

- (i) Ensure that there is a sustainable ICT-based research management system to facilitate sharing of research information.
- (ii) Set up a mechanism that ensures affordability of ICT usage for research purposes.

3.4.8 Gender and other factors of inequality

(a) Policy Issue

Education, training and research have not benefited all the population segments in society, including; rural peasants, women, people with disabilities, orphans, and small ethnic groups. There is imbalance in geographical distribution of research and training facilities with most of the institutions located in urban areas. There is disparity in education and training opportunities in terms of access and equity within the rural and urban areas. Moreover, most of the institutions do not have adequate facilities to cater for various gender groups. These inequalities lead to a whole vicious cycle of poverty.

(b) Policy Objectives

- (i) Taking affirmative action towards provision of education, training and research skills for all population segments to enable them to participate in research undertakings or benefit from research results.

(c) Policy Statements

The government shall ensure that:

- (i) There are no disparities in accessing education, training in research skills and undertakings to all population segments.
- (ii) The research results benefit all in terms of gender, religion, age, socio-economic distinction, geographical location, and physical disability.

3.4.9 Research Ethics

(a) Policy Issue

Conduct of research is expected to ensure that there are highest possible standards with regard to scientific merit. It is therefore expected to take into account such matters as protection of research subjects and safeguarding the environment, acknowledgement of work of others and sources, copyrights and patents, integrity in connection with fabrication of data, cheating, non-transparency, disclosure of confidential information, plagiarism and falsification.

Currently, most of the research being proposed/conducted lacks scientific merits in terms of justification/rationale, scientific soundness and clarity of the objectives; methodologies to be employed; data handling and processing; expected outputs and their usefulness to the social welfare of the surrounding communities and environment. There is lack of proper institutional Memoranda of understanding (MoU) between collaborating institutions/countries and individuals in conducting the research; ineffective review committees at the institutional and national levels.

(b) Policy Objectives

- (i) Inculcating the culture of adhering to research ethics and ensuring that research conducted safeguards the environment.

- (ii) Fostering conduct of research that has potential for advancement of knowledge and improvement of products, processes and services.
- (iii) Fostering equitable sharing of research resources and benefits/IPR particularly with local researchers/institutions/research communities.

(c) Policy Statements

The Government shall:

- (i) *Promote a culture of research ethics in the conduct of research and support research that safeguards the environment.*
- (ii) Facilitate carrying out of research with potential for advancement of knowledge and improvement of products, processes and services.
- (iii) Ensure equitable sharing of research resources and benefits.