NCRST
National Commission On Research Science & Technology

NATIONAL RESEARCH AND EXPERIMENTAL DEVELOPMENT SURVEY

MAIN ANALYSIS AND STATISTICAL REPORT 2021/22

NAMIBIA

Namibia Statistics Agency

UNITY LIBERTY JUSTICE

Sweden
Sverige

UNESCO

National Commission on Research, Science and Technology (NCRST)
Corner of Louis Raymond and Grant Webster Street

Private Bag 13253
Olympia
Windhoek
Tel: +264 61 431 7000
Email: info@ncrst.na

NATIONAL RESEARCH AND EXPERIMENTAL DEVELOPMENT SURVEY - MAIN ANALYSIS AND STATISTICAL REPORT 2021/22

Printed by John Meinert Printing
Website:http//ncrst.na

Publication date: April 2024

FOREWORD

Dr. Itah Kandjii- Murangi
Minister of Higher Education, Technology & Innovation

In order to strengthen the National System of Innovation (NSI), we need to increase Government Expenditure on Research and Development (GERD) and steer Science, Technology and Innovation (STI) to address societal challenges. In 2021, the Government of the Republic of Namibia (GRN) adopted the revised National Science, Technology and Innovation Policy (NSTIP) in 2021 as a comprehensive policy framework aligned with the country's Vision 2030, the Harambee Prosperity Plan (I and II), the African Union (AU) Science, Technology and Innovation Strategy for Africa (STISA-2024) as well as the United Nations Sustainable Development Goals (SDGs). The revised NSTIP is also aligned with other national policy frameworks such as the Industrial Policy of 2012, the National Public Sector Innovation Policy of 2021, the Namibian Space Science and Technology Strategy of 2021 and the Technical and Vocational Education and Training (TVET) Policy of 2021.

It is my greatest honour to present Namibia's second Research and Experimental Development (R&D) survey report for the 2021/22 financial year R&D activities. In 2016, we launched the first R&D report for the 2013/14 financial year R&D activities. Ideally, we would have liked to have the data on R&D collected annually, but there are inhibiting factors beyond our control, and thus the gap being experienced in collecting and producing the R&D data each year.

During the 2013/14 R&D data report, our Gross Domestic Expenditure on R&D (GERD) stood at 0.34% of Gross Domestic Product (GDP). During the 2021/22 R&D data report, it is observed that Namibia's GERD stands at 0.73% of the national GDP. However, it should be noted that this Figure is still below the 1% of the GDP investment in R&D agreed by the African Union (AU) member states in 2006. According to the UNESCO Institute for Statistics (UIS), estimates for 2019 show that Africa's funding of R&D stood at 0.42% of the continent's GDP, which is far below the global average of 1.7% and the lowest in the world. This puts Africa at a strategic disadvantage in the creation and application of scientific knowledge and technological developments. AU member states agreed to achieve the 1% of GDP target within the First Ten-Year of Implementation Plan 2013-2023 of the African Union Commission Agenda 2063 and the STISA Implementation Plan 2015-2024 as the desired minimum expenditure on R&D. Many member states, including Namibia have not been able to achieve the 1% target at the time of the data collection for this report in 2022. It is for this reason that we as policymakers and statisticians need to broaden our understanding of the importance of Science, Technology, and Innovation (STI) indicators to national development. Some of the pertinent questions we need to ask ourselves are: whether the data that we collect are relevant and adequate to inform policy decisions and who uses the data and how and when? In addition, do we have the capacity to analyse complex data to inform policy making and national strategy development?

The R&D and STI indicators in general, should help us better describe our national innovation system, its structures and functionalities, the policies and programmatic interventions and the impact they have on our economy and society. The importance of politicians, statisticians, and scientists working together to interpret these data and develop suitable solutions cannot be overstated. Only then will we be able to fully realize the potential for our nation to profit from scientific and technological advancements. The National Commission on Research, Science and Technology was established by the Research, Science and Technology Act, 2004 (Act No.23 of 2004) to coordinate, promote and develop Research, Science, Technology and Innovation in the country and as such, ensure that we strengthen R&D and our National Innovation System in order to achieve the goals of Namibia's Vision 2030. It gives me great pleasure to report that the GERD has significantly increased since 2014, and Namibia is steadily moving closer to both our own NSTIP targets for 2020–2030 and the 1% target set by the AU. Nevertheless, it also unequivocally shows that the government must significantly boost its R&D spending.

I want to thank the National Commission on Research, Science and Technology (NCRST), the University of Namibia (UNAM) and the National Statistics Agency (NSA) for their continued collaboration in producing this report. I would further like to use this opportunity to thank all stakeholders from the private sector, government ministries, offices and agencies and governmental research institutions, higher education institutions and not-for-profit organizations for their cooperation with the enumerators which led to the success of this exercise.

Dr. Itah Kandjii- Murangi

Dr. Itah Kandjii- Murangi
Minister of Higher Education, Technology and Innovation

STATEMENT

Prof Dr. Jacob Nyambe
National Commission on Research, Science and Technology

BY THE CHAIRPERSON OF THE NCRST

We are living in an era where knowledge production and its application thereof, is a key determinant for a country's success in addressing pertinent societal needs. Scientific knowledge plays an integral role in creating innovative products and services, mitigating climate change and addressing social and environmental challenges. Governments all over the world are investing resources to stimulate the production and uptake of scientific knowledge by developing appropriate policies and frameworks to nurture and enhance Research and Experimental Development (R&D).

In the case of Namibia, the Government has developed various policy frameworks, such as the Research Science and Technology (RST) Policy of 1999, the RST Act of 2004 (Act No.23 of 2004), and the Revised Science, Technology and Innovation Policy for implementation from 2020-2030 with the comprehensive goal of addressing social, environmental and economic challenges.

R&D investment is critical to support broader government developmental efforts and to ensure the acceleration and attainment of sustainable development goals: such as poverty alleviation; sustainable management of water resources; combating-climate change, improving food security, improving public health, safeguarding natural resources, and improving access to affordable, reliable, and modern energy sources while striving for a green and inclusive industrialisation. It is therefore imperative that we continuously assess and escalate our R&D investments efforts in these areas.

It is against this backdrop that the second R&D survey in the 2021/22 financial year was conducted to produce the updated R&D statistical data to assess the country's R&D performance and if need be, a new policy direction. The second National R&D Survey was conducted with the support of the Swedish International Development Cooperation Agency (SIDA) and the UNESCO Country Team (UNCT) in Namibia. The project "Strengthening Science Technology and Innovation Systems for Sustainable Development in Africa", funded by SIDA, focused on delivering the aspirations of the 2017 UNESCO Recommendation on Science and Scientific Researchers (RS||SR), in six African countries, including Namibia. The main objective of the project was to strengthen the STI systems and governance within UNESCO's global framework for monitoring, policy support and advocacy for (RS||SR).

I want to thank the management and staff of the NCRST and UNAM for accomplishing this mammoth task as well as the NSA for certifying the data and report and thereby ensuring that we produced the second R&D statistical report for Namibia. It is my hope that the data in this report will be used extensively across various sectors in our discussions and with our global partners to support the course of development of our country.

Prof Dr. Jacob Nyambe

Prof Dr. Jacob Nyambe
Chairperson
National Commission on Research, Science and Technology

STATEMENT

BY THE CHIEF EXECUTIVE OFFICER OF NCRST

Prof Dr. Anicia Peters
National Commission on Research, Science and Technology

The assessment of R&D data encompasses two vital aspects: the expenditure on R&D and the status of R&D personnel. These indicators play a crucial role in gauging the extent of our country's R&D efforts within the framework of national development. The R&D survey provides statistics on R&D expenditure and human resources dedicated to R&D, offering an overview of the status of R&D activities in Namibia. R&D data serves as the foundation for science policy development, influencing research priorities, government funding levels, human development, and incentives for R&D and innovation. R&D statistics are widely used to identify and focus on R&D personnel, especially researchers, who play a critical role in the creation of new knowledge.

The R&D Survey data is important as it is part of a family of STI indicators alongside the Innovation Survey data which are collected and analysed using the methodology and standards in the manuals of the Organisation for Economic Co-operation and Development (OECD), the Frascati (2015) and Oslo (2018) manuals respectively.

Namibia's Vision 2030 articulated through National Development Plans (NDPs), and the Harambee Prosperity Plan 2 (HPP2) emphasise Namibia's development goals, targeting specific strategies for economic growth, poverty eradication, inequality reduction, and social inclusion. They recognise the significance of innovation and the application of science and technology in driving progress. The revised Research, Science, and Technology and Innovation Policy (RNSTIP 2020-2030) plays a pivotal role in aligning R&D activities to Namibia's national priorities and acknowledging research, science, technology, and innovation as fundamental enablers of sustainable development. Regular national R&D Survey Reports inform whether Namibia is progressing towards the RNSTIP's goals and where R&D investment has to be targeted to ultimately achieve the goals of Vision 2030.

Through updated R&D indicators and strategic integration of NDP5 and the emerging NDP6, HPP2, RNSTIP into the National Programme on Research, Science, Technology and Innovation (NPRSTI-II), the country is positioned to comprehensively leverage knowledge, innovation, and research to address developmental challenges. The roles of R&D, STI, NSI, and investments are pivotal, and the importance of NCRST in gathering statistics lies in providing informed contributions to policymaking and decisions.

R&D indicators further aim to develop Science, Technology, and Innovation (STI) metrics, crucial for benchmarking and informing policy decisions. These indicators play a vital role in guiding interventions for STI to significantly contribute to socio-economic development. R&D contributes to innovation, competitiveness, and economic growth by creating and diffusing new knowledge. Countries recognising the importance of R&D and Innovation acknowledge that increased investments in R&D lead to technological progress, innovation, skilled human resources, improved productivity, economic growth and employment.

The 2021/2022 National R&D Survey Report is an important instrument to gauge how the country should proceed with R&D investments into the emerging economies such as green hydrogen and green ammonia, kelp forests, oil and gas, critical raw materials beneficiation implementation and green manufacturing. It can further direct how the country should position investments in R&D to leverage digitalisation, especially the rapid advances in Artificial Intelligence and mitigating its potential harms.

Prof Dr. Anicia Peters

Prof Dr. Anicia Peters
Chief Executive Officer
National Commission on Research, Science and Technology

STATEMENT

BY THE STATISTICIAN GENERAL

Mr. Alex Shimuafeni
Namibia Statistics Agency

The Namibian Statistics Agency (NSA) is established in terms of Section 6 of the Statistics Act, 2011 (Act No. 9 of 2011), as the central repository for all statistics produced in Namibia. The NSA also acts as a custodian for statistics in Namibia through the collection, production, analysing and disseminating of official and other statistics in Namibia.

Since the first R&D Survey, the NSA and NCRST established a formal basis for cooperation in the process of the development and adoption of survey instruments, training of enumerators as well as respondents in preparation for the R&D Survey for the 2021/22 financial year.

Following the completion of the second R&D Survey, the report and other relevant documents were submitted to the NSA for certification as official statistics in terms of the Statistics Act No 9 of 2011. An assessment performed on the submitted documentation and materials, revealed that they are following the set standards as well as international and regional best practices.

This will allow future setting up of very specific targets as well as carrying out benchmarking studies and comparison of Namibia's STI policies and performance with those of other countries. With this assessment, I certify the 2021/22 R&D Survey results as official statistics and encourage its use by stakeholders across all sectors nationally and internationally.

Mr. Alex Shimuafeni

Mr. Alex Shimuafeni
Statistician- General
Namibia Statistics Agency

ABBREVIATIONS

BERD	Business Expenditures on Research and Development
CeSTII	Centre for Science, Technology and Innovation Indicators
FOS	Field of Science
FTE	Fulltime Equivalents
GDP	Gross Domestic Product
GERD	Gross Expenditures on Research and Development
GOVERD	Government Expenditures on Research and Development
HC	Headcount
HE	Higher Education
HERD	Higher Education Expenditures on Research and Development
NCRST	National Commission on Research, Science and Technology
NFP	Not-for-profit
NFPERD	Not-for-profit Expenditures on Research and Development
NSA	Namibia Statistics Agency
NSI	National System of Innovation
OECD	Organisation for Economic Co-operation and Development
R&D	Research and Experimental Development
S&T	Science and Technology
SIC	Standard Industrial Classification
SEO	Socio-Economic Objectives
STI	Science, Technology and Innovation
UNAM	University of Namibia

DEFINITION OF TERMS

Research and Experimental Development (R&D)	Comprises work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.
R&D	Covers three activities: basic research, applied research and experimental research.
Basic Research	Is experimental or theoretical work undertaken to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.
Experimental Research	Is systematic work, drawing on knowledge gained from research and practical experience that is directed to producing new materials, products and devices to create new processes, system and services; or to improve substantially those already produced or installed.
BERD	refers to Business Expenditure on Research and Development
GOVERD	Refers to Government Expenditure on Research and Development
HERD	Refers to High Education Expenditure on Research and Development
Full-Time equivalent (FTE)	Refers to the number of hours (person years of effort) spent on R&D activities.
Gross domestic products (GDP)	Are the total market value of all final goods and services produced in a country in a given year, equal to total consumers, investment and Government spending, plus the value of exports, minus the value of imports
Gross expenditure on research and experimental development (GERD)	Covers all expenditure for R&D performed on national territory in a given year. It includes domestically performed R&D financed from abroad but excludes R&D funds paid abroad. Extramural research and development, also known as external R&D, encompasses research activities conducted beyond the confines of an organization, such as contracted research projects or engaging other parties to carry out R&D on the organization's behalf.
Headcount	Refers to the number of people directly involved in or supporting R&D (i.e. the total number of R&D personnel).
Labour costs of R&D personnel	Personnel comprised of annual wages and salaries and all associated costs or fringe benefits, such as bonus payment, holiday pay, and contributions to pension funds and other social security payments, and payroll taxes. The labour costs of persons providing indirect services that are not included in the personnel data (such as security and maintenance personnel or the staff of central libraries, computer departments or head offices) are excluded from labour costs and included in the current expenditure.
Other current expenditure	Comprises non-capital purchases of materials, supplies and equipment to support R&D performed by the statistical unit in a given year
Other support staff (OSS)	Include skilled and unskilled craftsman, secretarial and clerical staff participating in R&D projects or directly associated with such projects.
Outsourced R&D	Refers to R&D done by another entity on behalf of the reporting unit and paid for by the reporting unit. Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and in the management of the projects concerned.
R&D intensity	Refers to gross expenditure on R&D as a percentage of GDP
R&D personnel	Include all persons employed directly on R&D activities, as well as those providing direct services such as R&D managers, administrators and clerical staff.
R&D performing sector	Comprises of Government, Higher Education, Business and Not-for-profit sectors
Standard Industrial Classifications (SIC)	Is a system for classifying industries by a four-digit code and this R&D survey used codes as published by the NEPAD ASTII for classification of economic activities of industrial
Socio-economic objectives (SEO)	The SEO classification provides an indication of the main beneficiary (ies) of R&D activities
Technicians and equivalent staff	Are persons whose primary tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences, or social sciences and humanities.

Table of Contents

List Of Table

List Of Figures

EXECUTIVE SUMMARY

The National Commission on Research, Science and Technology (NCRST), in partnership with the University of Namibia (UNAM), conducted the National Survey of Research and Experimental Development (R&D) for 2021/2022 to evaluate Namibia's R&D activities. These national R&D surveys yield essential data for designing interventions addressing national, sectoral, and local needs. They further serve as invaluable resources for effective planning and policy formulation in Science, Technology, and Innovation (STI) for the public and private sectors. The indicators align with OECD specifications, offering a comprehensive subset of Science and Technology (S&T) metrics. R&D indicators are instrumental in shaping Science, Technology, and Innovation (STI) frameworks and guiding policy decisions to enhance socio-economic development.

They underpin innovation, competitiveness, and economic growth by fostering the creation and dissemination of new knowledge. Recognising the pivotal role of R&D, nations increase investments in research, education, and technology, leading to technological advancements, innovation, and a skilled workforce, thereby boosting productivity, economic growth, and employment. R&D statistics furnish critical insights into R&D expenditure, human resources, and innovation activities, informing science policies, research funding allocations, and incentive schemes. They also aid in identifying and nurturing researchers as pivotal agents in knowledge creation.

Namibia's aspiration to transition from a resource-based to a knowledge-based economy necessitates robust innovation systems. R&D, as defined by the Frascati Manual, constitutes a cornerstone of innovation systems, driving technological advancements and future capabilities translated into tangible outcomes. Strategic assessment of existing R&D players, infrastructure, and activities, along with future potential, is imperative for fostering innovation, competitiveness, and economic performance. The R&D survey serves as a vital tool in this endeavour, aiming to produce comprehensive national STI reports, facilitate international comparability, and furnish evidence-based insights for policy formulation and decision-making.

The survey targeted various sectors, including Higher Education, Not-for-Profit Organisations, Government, and Business Enterprises, with a comprehensive analysis completed to generate STI indicators addressing multifaceted objectives. The National R&D survey for the fiscal year 2021/22 was executed by the National Commission on Research, Science and Technology (NCRST) in accordance with the guidelines in the Frascati Manual (2015). Section 5(n) of the Research, Science, and Technology Act of 2004 (Act No. 23 of 2004) mandates the NCRST to collect, disseminate and promote any research, science and technology results, statistics and reports.

The collection and utilization of data were duly authorized by the Namibia Statistics Act of 2011 (Act No. 9 of 2011) and adhered to the code of practice requirements outlined in Section 34 of the same Act. Furthermore, the survey was carried out in close collaboration with international stakeholders, including NEPAD/ASTII and UNESCO UIS, ensuring that the survey results meet rigorous standards for international comparability.

KEY R&D INDICATORS

The 2021/22 R&D Survey comprehensively measured Research and Development (R&D) activity across four sectors: business enterprise, government, higher education, and not-for-profit, as delineated in the Frascati Manual which is a globally accepted survey instrument for measuring R&D data. Tables 1 to 6 present a condensed overview of Gross Domestic Expenditure on R&D in relation to Gross Domestic Product (GDP) at current prices. Additionally, these tables summarize headcount and full-time equivalents of researchers, technicians, and support staff in various fields. The Tables also provide insights into the gender composition of personnel and the Namibian component within the R&D landscape.

TABLE 1: KEY R&D INDICATORS, 2013/14 & 2021/22

KEY R&D INDICATORS	2013/14	2021/22
Gross domestic expenditure on R&D (GERD (N$ 000)	471.733	1,328.816
Gross domestic product (GDP) at current prices (N$ 000)	139,331.618	181,553.000
GERD as a percentage of GDP	0.34	0.73
Total R&D personnel (HC)	1132	3439
Total Researchers (HC)	749	2502
Total Technicians (HC)	255	275
Total Support Staff (HC)	128	662
Total R&D personnel (FTE)	570	887.2
Total Researchers (FTE)	351	641.0
Total Technicians (FTE)	150	91.0
Total Support Staff (FTE)	69	155.2
Female researchers as a percentage of total researchers (HC)	38.7	49.5
Female researchers as a percentage of total researchers (FTE)	38.7	47.5
Total Namibian researchers as percentage of total researchers (HC)	73.3	82.7

Results of the 2021/22 R&D Survey indicated that Namibia's Gross Domestic Expenditure on R&D (GERD) as percentage of GDP is 0.73 percent. Table 1 shows a summary of the key results.

The Higher Education sector was the biggest spender for R&D in 2021/22 financial year. The Higher Education sector spent N$ 964 million on in-house R&D activities in 2021/22. This accounted for 72.5 percent of the GERD, making it the largest contributor to R&D expenditure. The Business sector also significantly contributed to R&D expenditure with 21.7 percent of the GERD during the year under review.

TABLE 2: IN-HOUSE R&D EXPENDITURE BY SECTOR, NAMIBIA, 2013/14 AND 2021/22

SECTOR	2013/14		2021/22	
	Amount in mil. N$	%	Amount in mil. N$	%
Business	53.9	11.4	288.2	21.7
Not-For-Profit	36.1	7.7	33.1	2.5
Government	216.6	45.9	43.6	3.3
Higher Education	165.2	35.0	964.0	72.5
TOTAL	471.1	100.0	1,328.9	100

The Not-for-Profit sector had the lowest expenditure on R&D (2.5 percent) in the reference period (Table 2). The results also indicated a decline in R&D expenditure from the Government sector, reduced from 45.9 percent in 2013/14 to 3.3 percent of the GERD in 2021/22.

TABLE 3: BUSINESS SECTOR INDICATORS

BUSINESS SECTOR INDICATORS	2013/14	2021/22
BERD (N$ 000)	53 884	288 171
BERD as % of GDP	0.04	0.16
BERD financed by Business enterprise (%)	92.2	42.3
Total Business sector R&D personnel (HC)	82	104
Total Business sector researchers (HC)	44	60
Total Business sector R&D personnel (FTE)	41.9	66.2
Total Business sector researchers (FTE)	24.5	43.9

Table 3 indicates that Business Expenditure on Research and Development (BERD) as a percentage of GDP in 2021/22 was 0.16 percent which increased from 0.04 percent in 2013/14. Slightly more than 40 percent of the BERD was financed from Business enterprises' own funds. The total Business sector R&D personnel (HC) and Full-time equivalent (FTE) personnel increased from 82 and 41.9 to 104 and 66.2, respectively.

TABLE 4: NOT-FOR-PROFIT SECTOR INDICATORS

NOT-FOR-PROFIT SECTOR INDICATORS	2013/14	2021/22
NFPERD (N$ 000)	36 081	33 073
NFPERD as % of GDP	0.03	0.02
NFPERD financed by private not-for -profit%	33.5	33.7
Total NFP sector R&D personnel (HC)	92	100
Total NFP sector researchers (HC)	31	47
Total NFP sector R&D personnel (FTE)	63.5	65.6
Total NFP sector researchers (FTE)	24.8	42

Not-for-Profit Expenditure on Research and Development (NFPERD) as a percentage of GDP slightly reduced from 0.03 percent in 2013/14 to 0.02 percent in 2021/22, with 33.7 percent of it financed from Not-for Profit's own funds. As shown in Table 4, the 2021/22 survey results reveal that R&D personnel FTEs from Not-for-profit increased slightly from 63.5 in 2013/14 to 65.6 in 2021/22, however researchers FTEs increased significantly from 24.8 to 42.

TABLE 5: GOVERNMENT SECTOR INDICATORS

GOVERNMENT SECTOR INDICATORS	2013/14	2021/22
GOVERD (N$ 000)	216 614	43 567
GOVERD as % of GDP	0.16	0.02
GOVERD financed by Government (%)	0.3	51.2
Total Government sector R&D personnel (HC)	343	659
Total Government sector researchers (HC)	174	595
Total Government sector R&D personnel (FTE)	253.1	78.2
Total Government sector researchers (FTE)	134.6	50.9

The 2021/22 R&D survey indicate that Government Expenditure on Research and Development (GOVERD) expressed as a percentage of GDP was 0.02 percent with 51.2 percent of this expenditure being financed from Government's own funds. This shows a decrease on the Government proportion of R&D expenditures on the GDP. However, proportion of Government expenditure on R&D from its own funds increased significantly. The total Government sector headcount (HC) also significantly increased from 343 to 659 (Table 5).

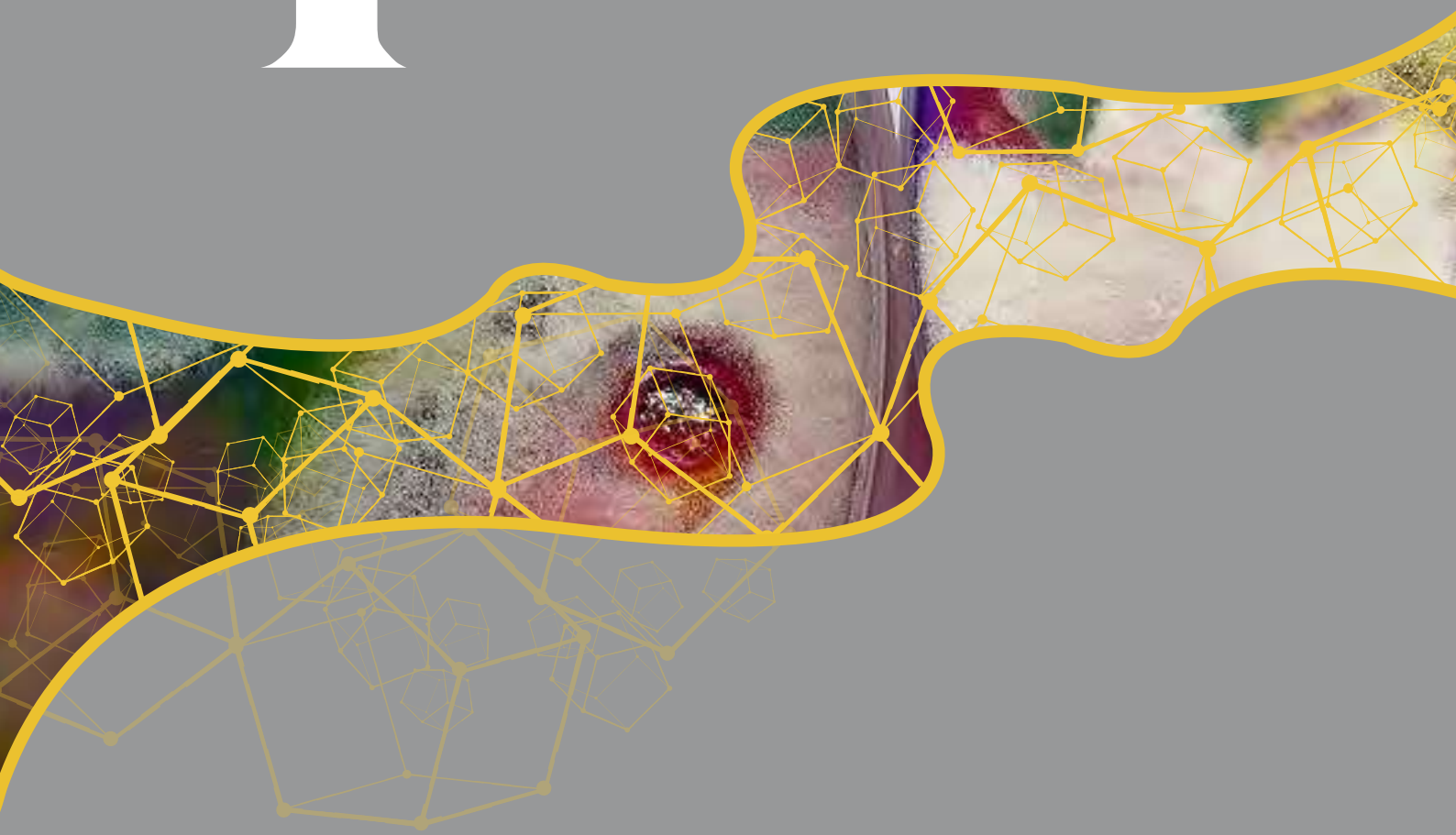
TABLE 6: HIGHER EDUCATION SECTOR INDICATORS

HIGHER EDUCATION SECTOR INDICATORS	2013/14	2021/22
HERD (N$ 000)	165 153	964 005
HERD as % of GDP	0.13	0.53
HERD financed by Higher Education	18.4	21.1
Total HE sector R&D personnel (HC)	615	2579
Total HE sector researchers (HC)	500	1 800
Total HE sector R&D personnel (FTE)	211.8	677.2
Total HE sector researchers (FTE)	167.4	504.2*

Table 6 provides a snapshot of key indicators within the Higher Education sector. Survey results indicate that Higher Education Expenditure on Research and Development (HERD) as a percentage of GDP improved from 0.13 percent in 2013/14 to 0.53 percent in 2021/22. The HERD financed from its own funds amounted to 21.1 percent of R&D expenditures. The total Higher Education sector R&D personnel in terms of HC and FTE stood at 2579 and 677.2, respectively.

1

RESEARCH AND DEVELOPMENT IN CONTEXT



CHAPTER 1:
R&D IN CONTEXT

1.1 INTRODUCTION

In an age of global connectivity and rapid technological evolution, research and experimental development (R&D) are pivotal for sustainable progress. Namibia acknowledges this, aligning its R&D efforts with international, continental, regional, and national frameworks such as the United Nations Sustainable Development Goals (SDGs) and the UNESCO's Institute for Statistics (UIS). Namibia has aligned its R&D investment efforts to the African Union's strategic goals to achieve the 1% of GDP target within the First Ten-Years of the Implementation Plan (2013-2023) of the African Union Commission Agenda 2063, the STISA Implementation Plan (2015-2024) and the Southern African Development Community's (SADC) objectives. Nationally, our R&D funding frameworks are in alignment to Namibia's own National Development Goals (NDGs) and the Harambee Prosperity Plan (HPP I&II). This report recognises achievements, such as the increase in Gross Domestic Expenditure on R&D (GERD) since 2014, while acknowledging the ongoing efforts to meet the African Union's 1% of GDP target. Key documents guiding Namibia's R&D efforts include the revised National Science, Technology, and Innovation Policy (NSTIP) (2020 to 2030), Vision 2030, AU's STISA-2024, and UN's SDGs.

1.2 BACKGROUND

The National Commission on Research, Science and Technology (NCRST) conducts the National Survey of Research and Experimental Development (R&D) to measure inputs in the R&D in the country. The first R&D Survey was conducted in 2013/14 in collaboration with the Namibia Statistics Agency (NSA) and the University of Namibia (UNAM). In 2021/22, NCRST commissioned the second R&D Survey to UNAM which was conducted during the period August to December 2021/22.

Generally, surveys generate data that enable the design and implementation of interventions to address national, sectoral, and local needs. The R&D surveys are a valuable source of information that facilitate effective planning and policy formulation with respect to Science, Technology and Innovation (STI) by both the public and private sectors. The indicators provided in the report consist of the main subset of Science and Technology (S&T) indicators; and data tables specified for R&D Surveys by the Organisation for Economic Co-operation and Development (OECD).

1.3 THE IMPORTANCE OF R&D STATISTICS

R&D indicators are aimed to develop Science, Technology and Innovation (STI) indicators. These indicators are vital in benchmarking and informing policy decisions on what interventions to take for STI to substantially contribute to socio economic development. R&D contributes to innovation, competitiveness and economic growth through the creation and diffusion of new knowledge. Countries that appreciate the importance of R&D and Innovation acknowledge increased investments in R&D and other activities such as education led to technological progress, innovation and skilled human resources, which in turn lead to improved productivity, economic growth and employment. The R&D survey provides statistics on R&D expenditure and human resources devoted to R&D. In many countries, R&D statistics have been utilized to provide an overview of the status of R&D activities. R&D data serves as the basis for the development of science policy related to developing research priorities, Government research funding level, human development and R&D and innovation incentive schemes. R&D statistics are also widely used to determine R&D personnel with a focus on researchers, who are critical to the creation of new knowledge.

1.4 METHODOLOGY

The 2021/22 R&D Survey was conducted according to the OECD guidelines presented in the Frascati Manual 2015. The Frascati Manual (OECD, 2015) is the proposed standard of measuring Research and Experimental Development (R&D) and defines R&D as creative work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of human, culture and society, and the use of this stock of knowledge to devise new application. The Frascati Manual proposes several approaches to surveying R&D-performing entities, including a census-based survey of all large R&D performers and a sample survey of the remaining R&D performer entities. A list of R&D performers (Government, Higher Learning Institutions, Not-for-Profit organisations, and Business enterprises) was compiled and verified for inclusion in the R&D Survey. The R&D Survey covered the Business enterprise, Government, Higher Education and Not- for-Profit institutions as defined in the Frascati Manual. The Namibian R&D Survey was conducted using the census-based survey approach for the Not-for-Profit sector, Business sector, Government sector and Higher Education sector. At the onset of the survey, a total of 125 entities were identified as potential R&D performers (73 Business, 21 Government, 18 Not-for-profit, 13 Higher Education), but only 97 entities were successfully interviewed in the survey. The response rate of the R&D survey was 77.6%. The sectors were surveyed during the period of September-December 2021/22. The data was collected using the standardised questionnaires across the four (4) sectors, following the UNESCO Institute for Statistics guideline for countries starting to measure R&D. Questionnaires were administered to respondents by a team of trained enumerators. Field supervision visits were undertaken to support the enumeration exercise. The full and detailed methodology is contained in Annexure II of the R&D Statistical Report.

2

RESEARCH AND DEVELOPMENT EXPENDITURE

CHAPTER 2:
R&D EXPENDITURE

2.1 GROSS DOMESTIC EXPENDITURE ON R&D

Gross Domestic Expenditure on GERD comprises of Research and Experimental Development (R&D) undertaken by Business enterprises, Not-for-Profit organizations, Government and the Higher Education sectors in the country. The 2021/22 R&D expenditure was at N$ 1.328.816 000.

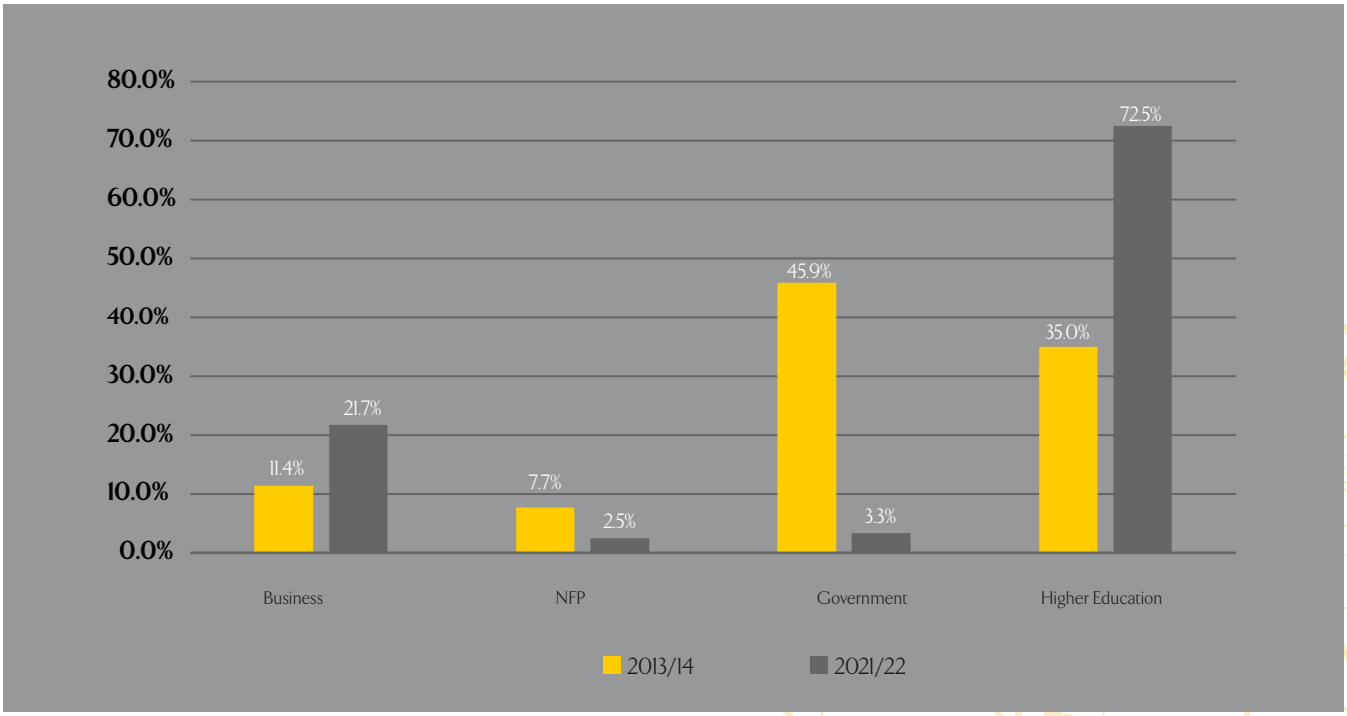
2.2 GERD AS A PERCENTAGE OF GDP

GERD as percentage of GDP has increased since 1990 in Namibia. The R&D Survey indicates that GERD accounted for 0.73% of GDP in 2021/22 for Namibia. GERD expressed as a percentage of GDP indicates the concentration or intensity of R&D in an economy, an important aspect of national competitiveness, internationally in terms of research efforts.

2.3 GERD BY SECTOR

Higher Education expenditure on R&D amounted to N$ 964 million, equivalent to 72.5 percent of GERD. Hence, Higher Education was the largest performer of R&D in Namibia. Business expenditure on R&D was N$ 288.2 million, equivalent to 21.7 percent, making Business sector the second largest performer of R&D in the country. Government expenditure on R&D amounted to N$43.6 million and Not-for-Profit expenditure on R&D amounted to N$ 33.1 million, equivalent to 3.3 percent and 2.5 percent respectively, making Not-for-profit (NFP) the lowest R&D performer in 2021/22 in Namibia (Figure 2.1).

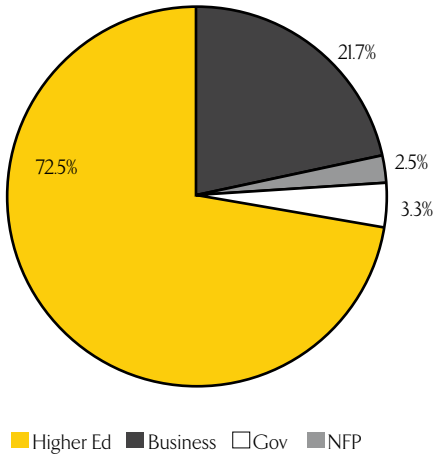
FIGURE 2.1: R&D EXPENDITURE PER SECTOR, NAMIBIA, 2013/14 & 2021/22



Source: National Survey for Research and Experimental Development report, 2013/14

FIGURE 2.2 shows the R&D expenditure as percentage of GDP per sector. The Higher Education R&D expenditure as percentage of GDP was 72.5 percent in 2021/22 improved from 35.0 percent in 2013/14 and Business expenditures improved from 11.4 to 21.7 percent. The Government R&D expenditure as a percentage of GDP decreased significantly from 45.9 percent in 2013/14 to 3.3 percent in 2021/22.

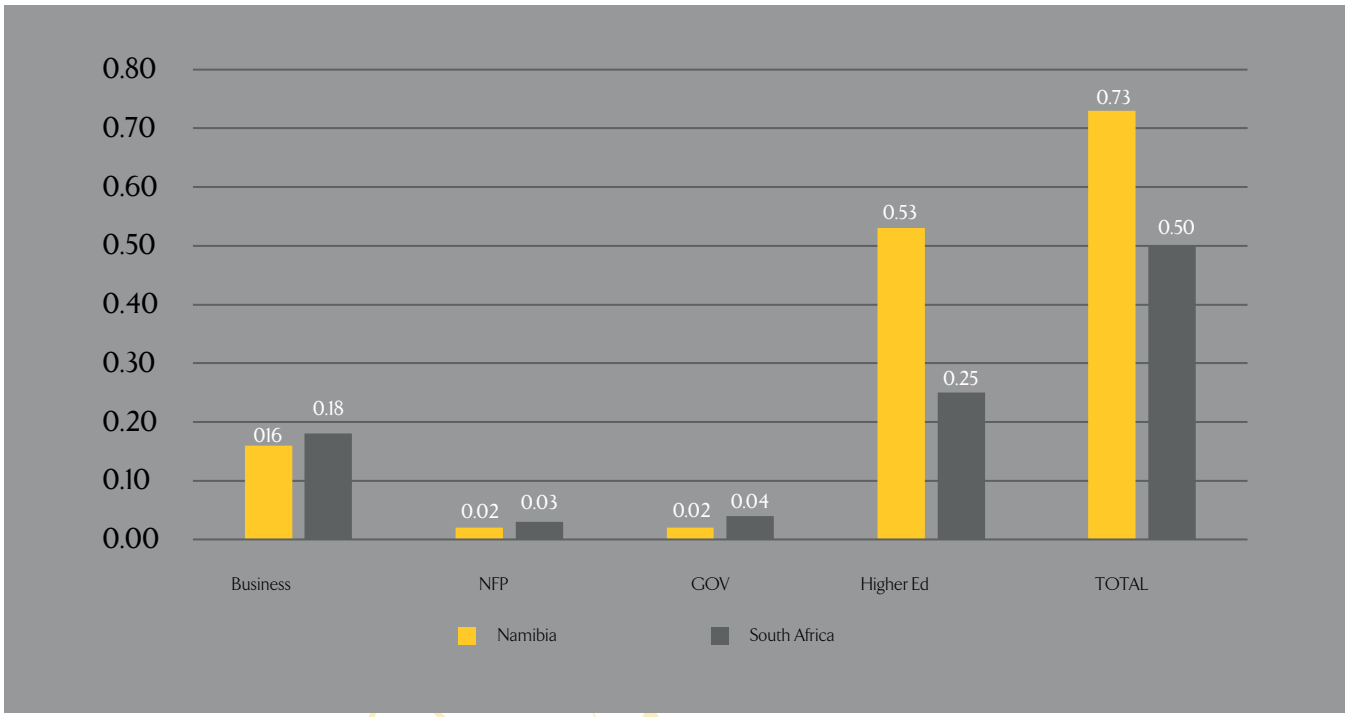
FIGURE 2.2: GERD AS PERCENTAGE OF GDP PER SECTOR (%) FOR NAMIBIA, 2021/22



2.4 INTERNATIONAL COMPARISON

Comparison of Namibia and South Africa on GERD as percentage of GDP by sectors shows a similar trend. Government and Not-for-Profit sectors had the lowest contributions while Higher Education's expenditures on R&D showed significant contributions both for Namibia and South Africa (Figure 2.3).

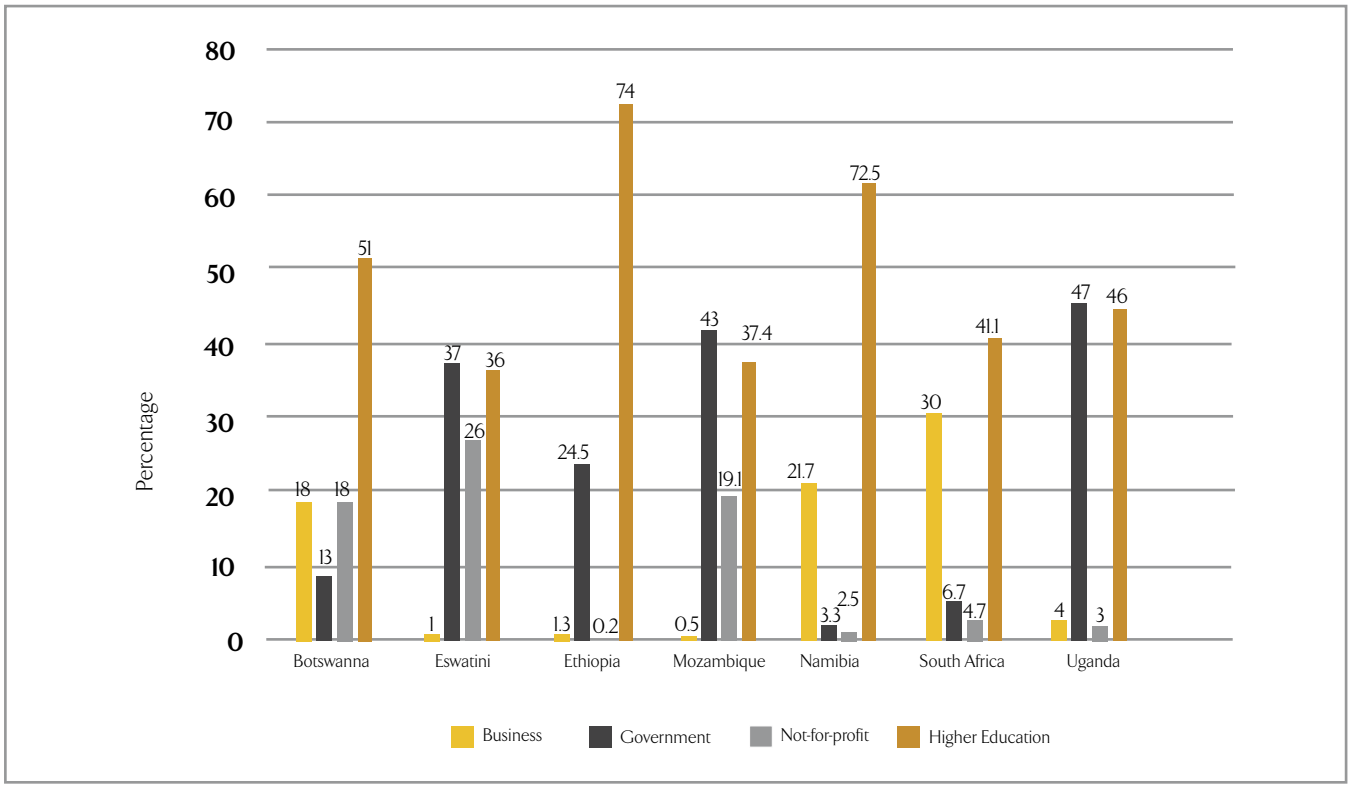
FIGURE 2.3: GERD AS PERCENTAGE OF GDP PER SECTOR (%) FOR NAMIBIA & SOUTH AFRICA, 2021/22



Source: South African National Survey of Research and Experimental Development, 2020/21

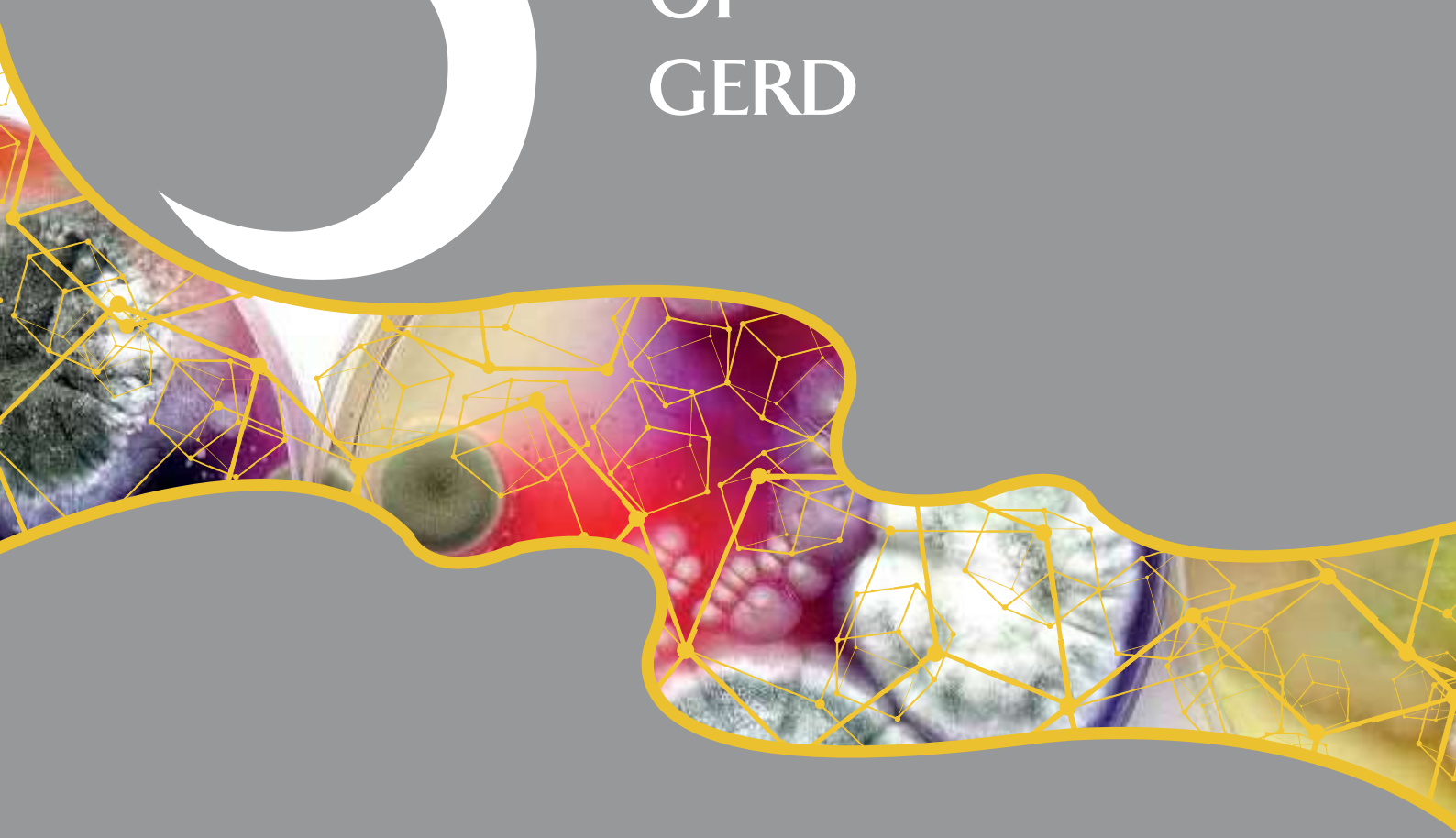
FIGURE 2.4 provides GERD by sector of performance in percentage from 7 countries. Uganda (47%), Mozambique (43%) and Eswatini (37%) invested more in R&D activities in the Government sector, while South Africa (30%), Namibia (21.7%) and Botswana (18%) invested more of their GERD in the Business sector. The Higher Education Sector had the highest concentration of research activities in the countries ranging from 36.0 percent in Eswatini to as high as 74.0 percent in Ethiopia. Namibia had the second highest concentration of research activities in the Higher Education sector with 72.5 percent.

FIGURE 2.4: PERCENTAGE OF R&D EXPENDITURE BY SECTOR AND COUNTRY



Source: Africa Innovation Outlook III, 2019

3 CATEGORIES OF GERD

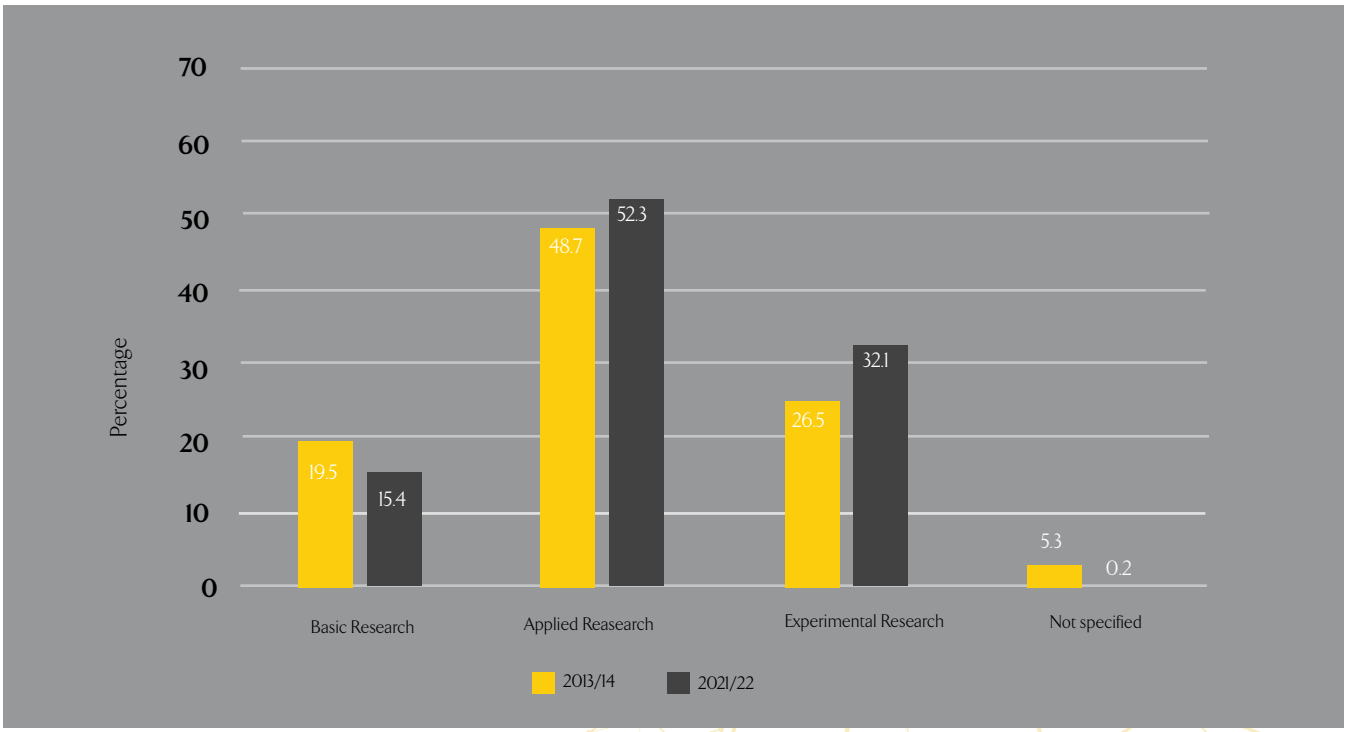


CHAPTER 3:
CATEGORIES OF GERD

3.1 GERD by Type of Research

As shown in Figure 3.1. R&D expenditure on applied research accounted for the largest proportion of R&D expenditure in 2021/22 at 52.3 percent of total GERD. R&D expenditure on experimental development significantly increased from 26.6 percent in 2013/14 to 32.1 percent in 2021/22 and basic research decreased to 15.4 percent in 2021/22 from 19.5 percent in 2013/14. Only 0.2 percent of the responding institutions did not classify the type of research.

FIGURE 3.1: TOTAL GERD BY TYPE OF RESEARCH (%), NAMIBIA, 2013/14 & 2021/22

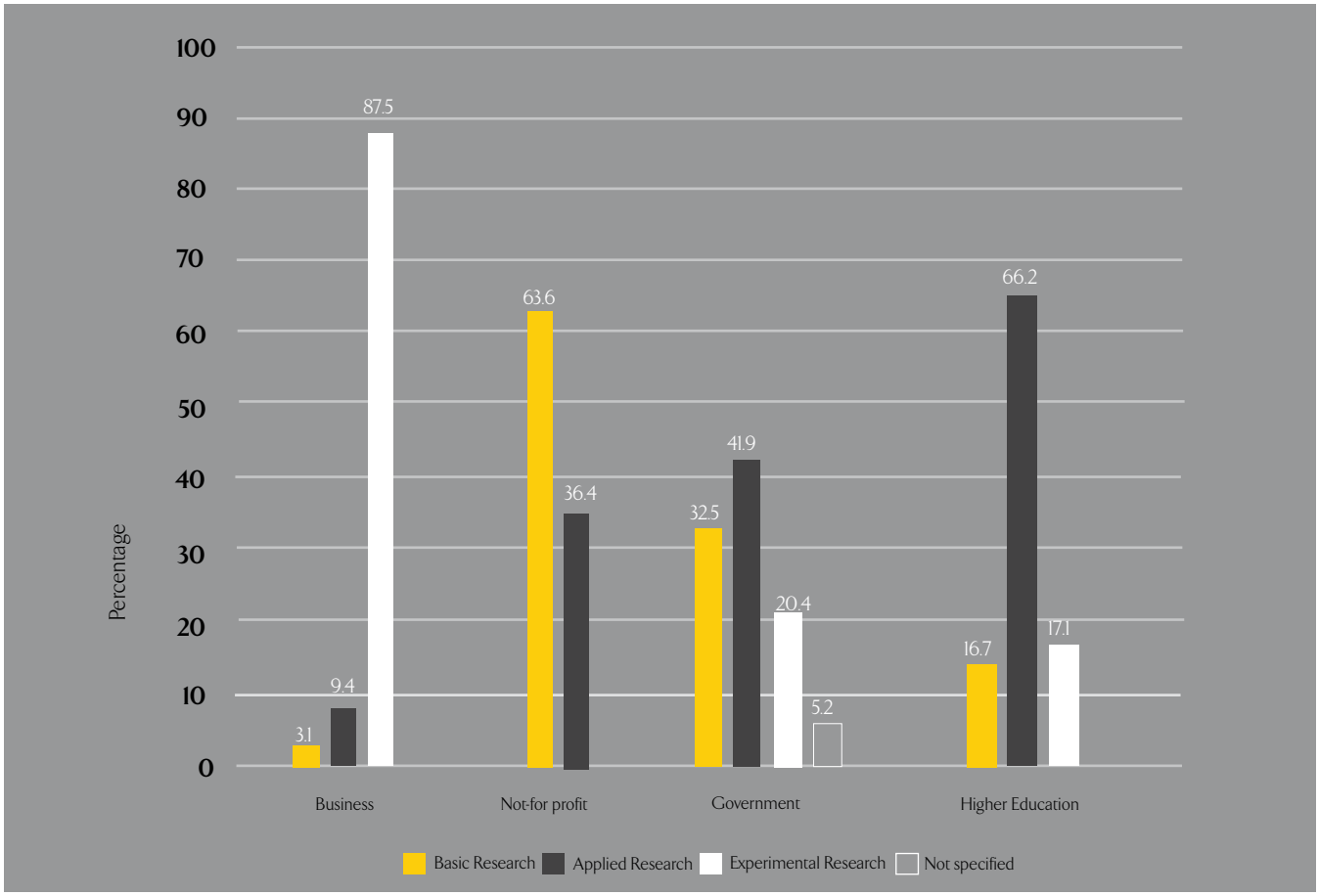


Source: National Survey for Research and Experimental Development report, 2013/14

3.2 TOTAL GERD BY TYPE OF RESEARCH AND SECTOR OF PERFORMANCE

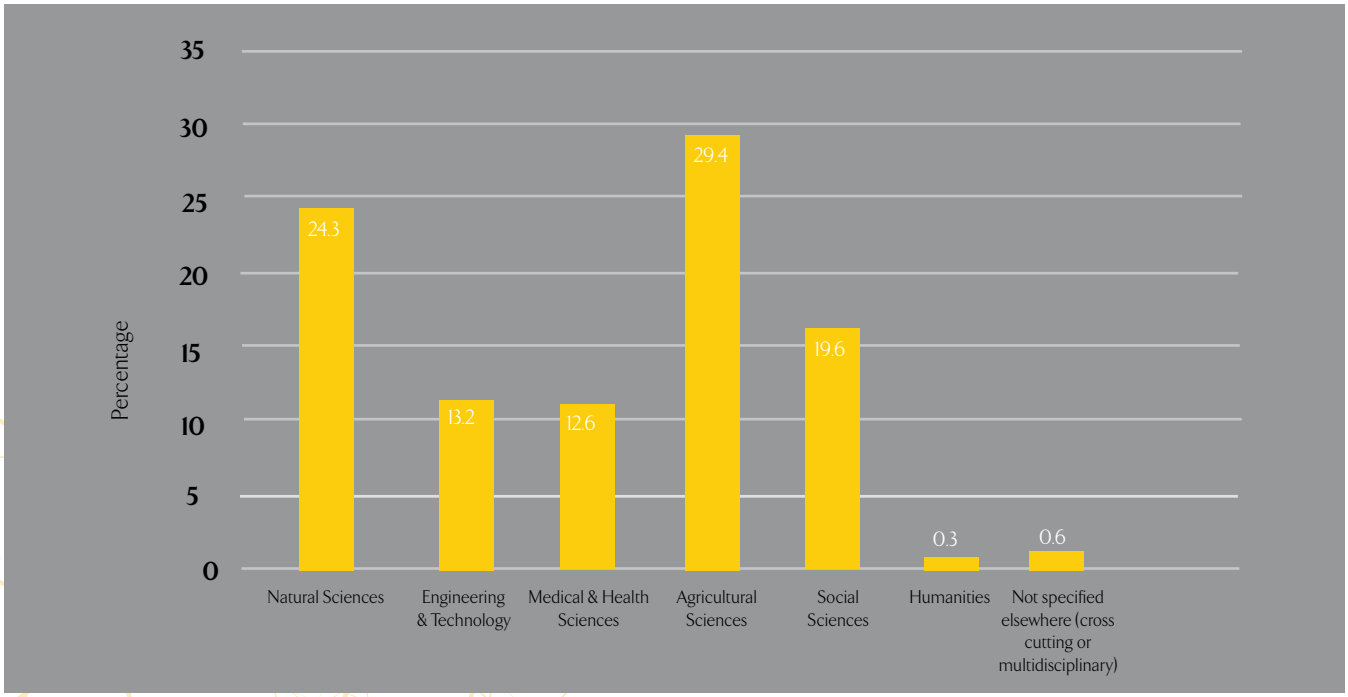
FIGURE 3.2 shows the R&D activities in the Business sector were mainly towards experimental research, with 87.5 percent of expenditure devoted to this type of research. Experimental research is systematic work, drawing on knowledge gained from research and practical experience directed to producing new materials, products and devices to installing new processes, system and services; or to improve substantially those already produced or installed. R&D activities in the Government sector focused on applied and basic research, with 41.9 percent and 32.5 percent, respectively. The Higher Education sector was the highest performer of applied research, devoted 66.2 percent of the R&D expenditure while Not-for Profit devoted 63.6 percent to basic research.

FIGURE 3.2: TOTAL GERD BY TYPE OF RESEARCH AND SECTOR OF PERFORMANCE



Agricultural sciences accounted for the largest share of GERD in 2021/22 at 29.4 percent amounting to N$ 390.9 million (see Figure 3.3). The breakdown on GERD for the agriculture sciences shows that forestry and fisheries accounted for largest share of GERD within agricultural sciences at 67.5 percent. R&D expenditure in the natural sciences amounted to N$ 323.2 million or 24.3 percent of GERD in 2021/22. R&D expenditure on social sciences was N$ 260.7 million or 19.6 percent. The lowest research fields were humanities (0.3%), medical and health science (12.6%) and engineering and technology (13.2%).

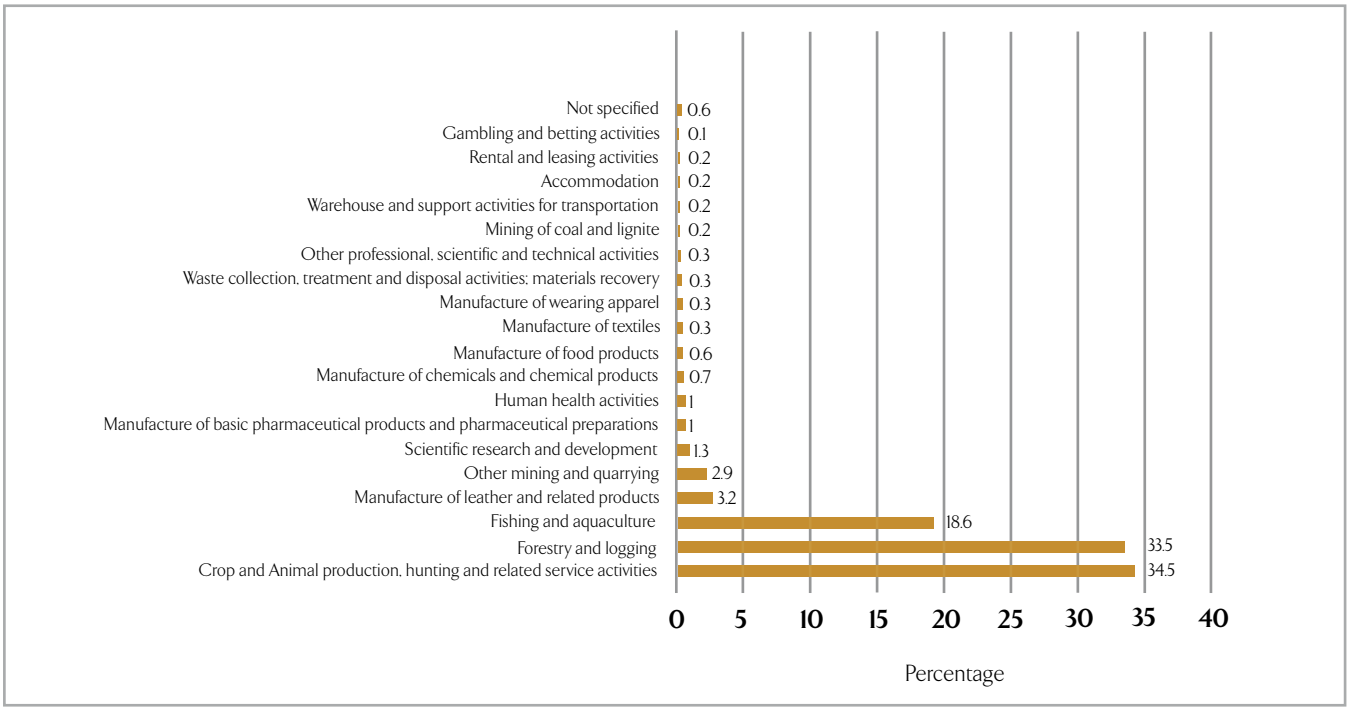
FIGURE 3.3: GERD BY RESEARCH FIELD, 2021/22



3.3 BUSINESS SECTOR R&D EXPENDITURE BY STANDARD INDUSTRY CLASSIFICATION

FIGURE 3.4 shows that from the 2021/22 R&D Survey, crop and animal production accounted for the largest share of R&D Business expenditure (BERD), spending N$ 99.4 million or 34.5 percent. Forestry and logging were the second largest contributor to BERD, with expenditure of N$ 96.6 million. Fishing and aquaculture also contributed N$53.6 million or 18.6 percent to BERD respectively.

FIGURE 3.4: BUSINESS SECTOR R&D EXPENDITURE BY STANDARD INDUSTRY CLASSIFICATION, %, NAMIBIA, 2021/22



3.4 GERD BY SOCIO-ECONOMIC OBJECTIVES

FIGURE 3.5 shows that agriculture accounted for the largest share of R&D spending in 2021/22 amounting to N$265.2 million for overall socio-economic objectives followed by environment with N$190.0 million and then health with N$133.3 million. There was no R&D expenditure accounted for defence in 2021/22 which was also the case in 2013/14.

FIGURE 3.5: GERD BY SOCIO-ECONOMIC OBJECTIVES, N$ IN MILLIONS

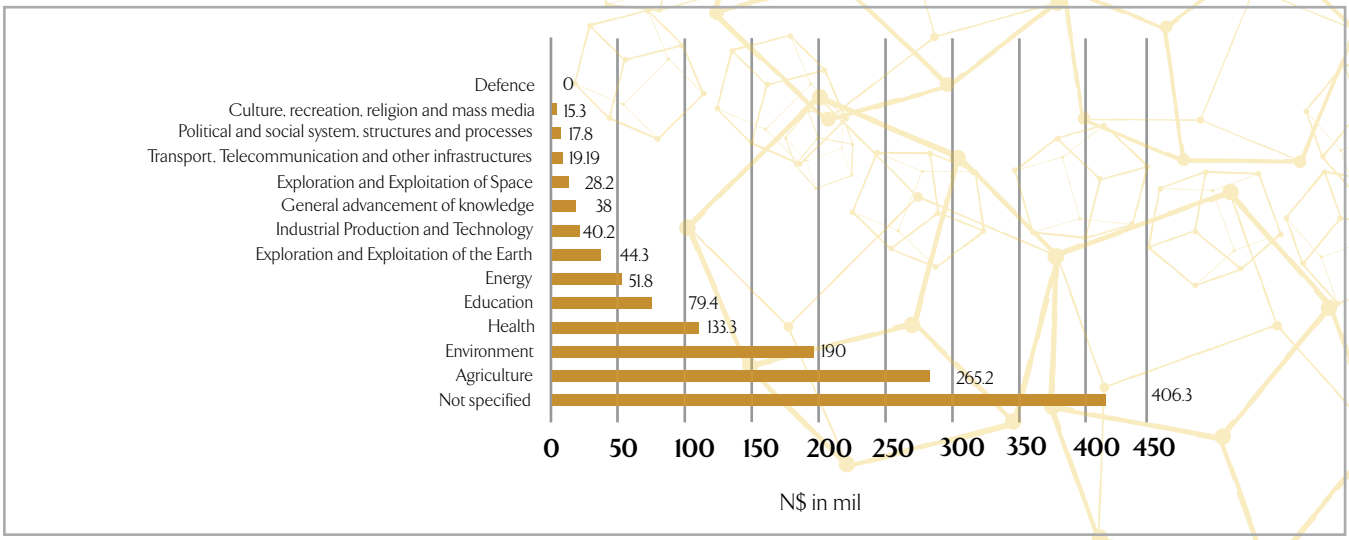
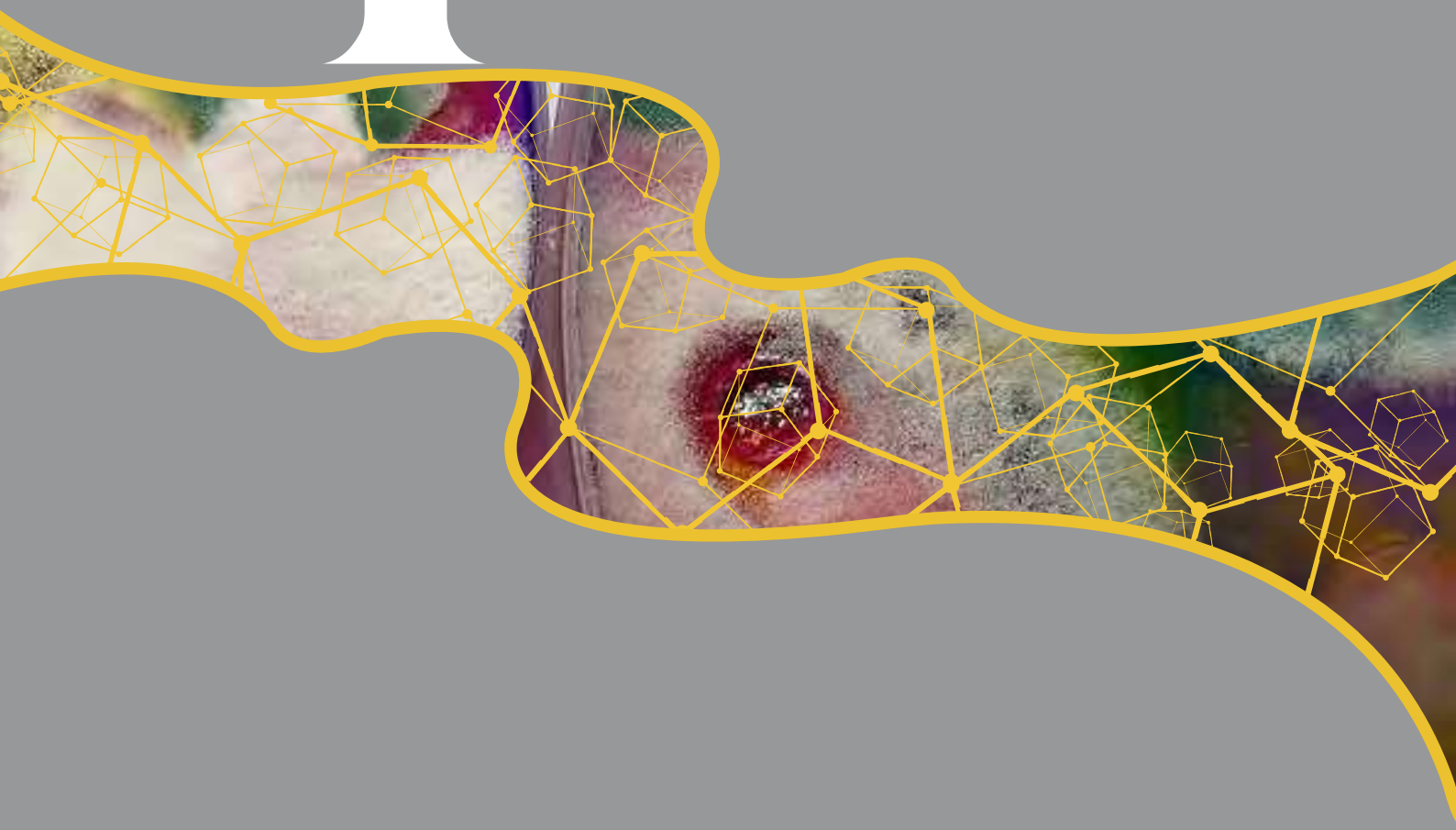


TABLE 3.1 below indicates that Business enterprises spent the largest R&D expenditure on agriculture with N$ 155.2 million or 53.9 percent and environment with N$99.0 million or 34.4 percent. Not-for-Profit spent the largest R&D expenditure on the exploration and exploitation of the earth with about N$ 20 million or 60.2 percent and agriculture (30.2%). Environment took up the largest share of R&D expenditures for the Government with N$13.9 million or 32.1 percent. Government also spent a significant amount of its R&D expenditures on health and on the exploration and exploitation of the earth. Higher Education R&D expenditure was spread across various socio-economic objectives ranging from health (12.2%), agriculture (10.1%), education (8.1%), environment (8%), energy (5.1%) and general advancement of knowledge (3.2%).

TABLE 3.1: GERD BY SOCIO ECONOMIC OBJECTIVE AND SECTOR (%)

SOCIO ECONOMIC OBJECTIVE	Business (%)	Government (%)	Not-for-profit (%)	Higher education (%)	TOTAL (%)
Agriculture	53.9	6.6	30.2	10.1	20.0
Culture, recreation, religion and mass media	0.2	0	0	1.5	1.1
Defence	0	0	0	0	0.0
Education	0	1.5	2.2	8.1	6.0
Energy	0.4	2.7	0	5.1	3.9
Environment	34.4	32.1	0	8	14.3
Exploration and Exploitation of Space	1.2	0	0	2.6	2.1
Exploration and Exploitation of the Earth	0.3	16.3	60.2	1.7	3.3
General advancement of knowledge	2.1	0.5	1.5	3.2	2.9
Health	2.6	16.9	2.1	12.2	10.0
Industrial Production and Technology	4.4	0.2	1.5	2.8	3.0
Political and social system, structures and processes	0	5.6	2.2	1.5	1.3
Transport, Telecommunication and other Infrastructures	0	10	0	1.5	1.4
Not Specified	0.6	7.5	0	41.6	30.6
TOTAL	100	100	100	100	100.0

4 PERSONNEL IN R&D

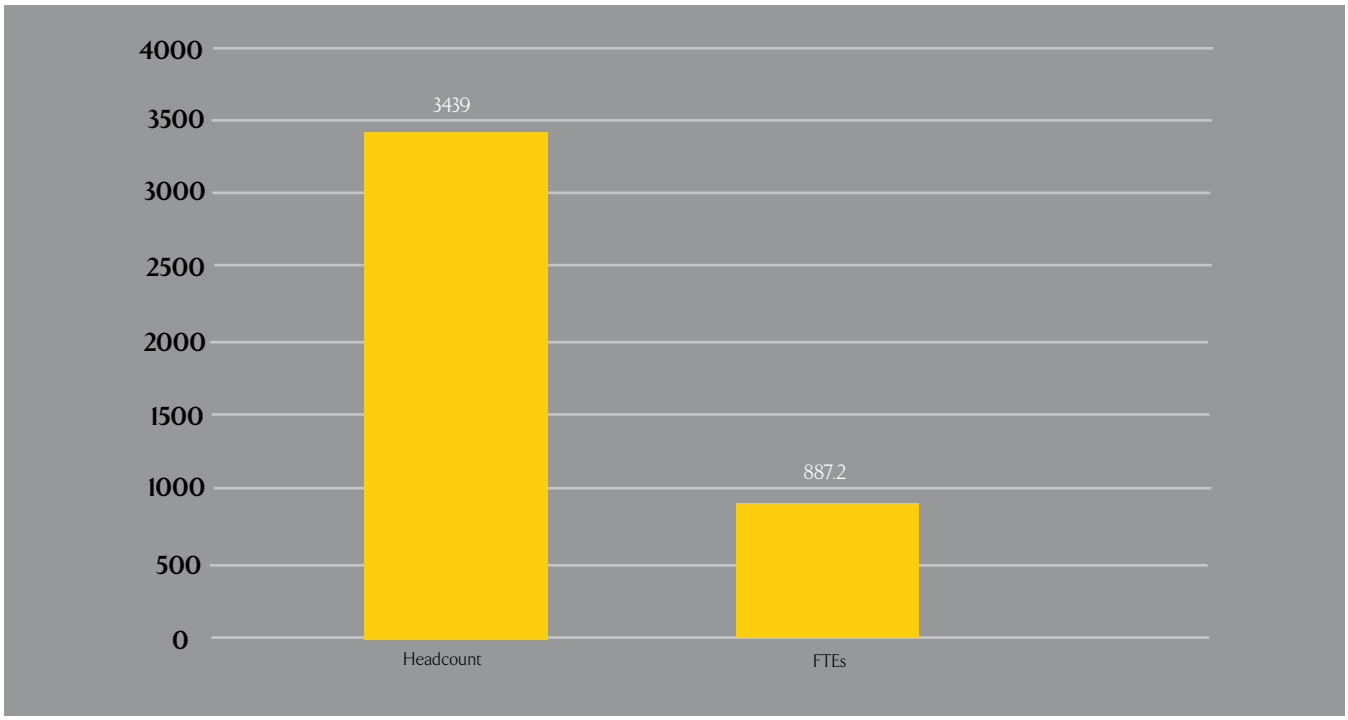


CHAPTER 4:
PERSONNEL IN R&D

4.1 R&D PERSONNEL

R&D personnel headcount totalled 3 439 in 2021/22 while R&D personnel (FTEs) totalled 887.2 in 2021/22. FIGURE 4.1 shows that out of 3 439 R&D personnel, only 887 were devoted to R&D on full time equivalent. R&D personnel increased by two-thirds (67%), from 2013/14 to 2021/22.

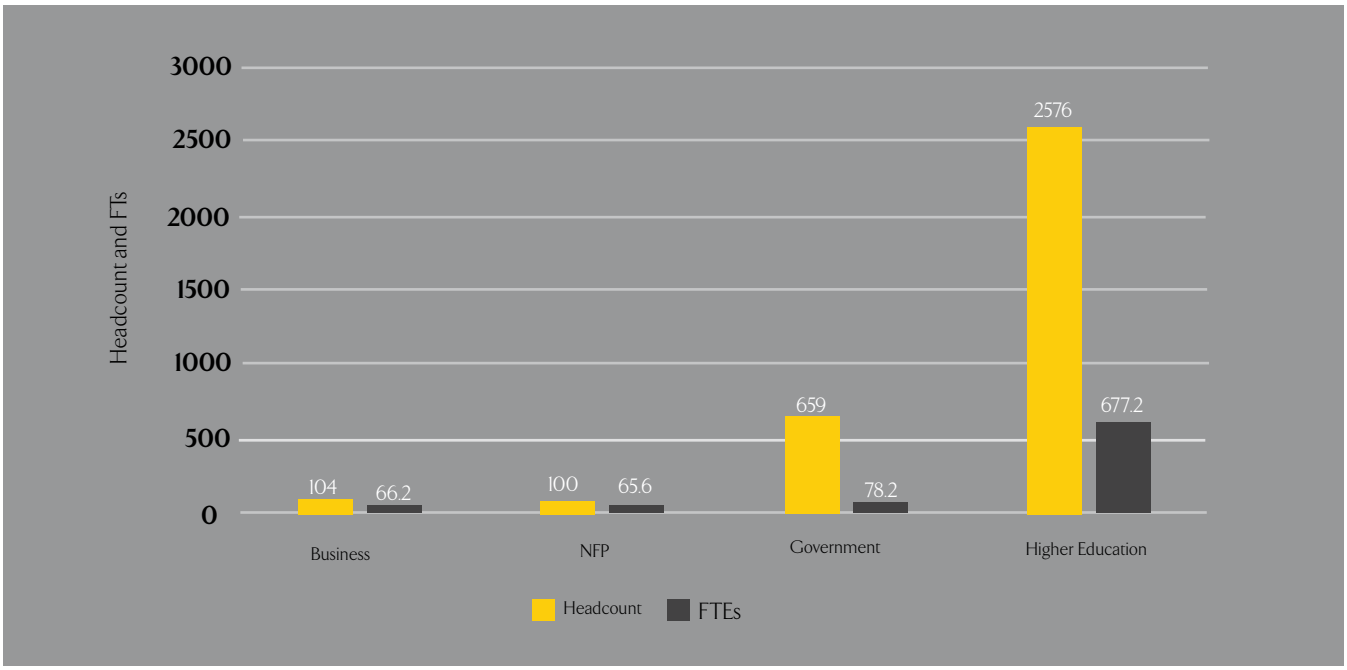
FIGURE 4.1: R&D PERSONNEL HEADCOUNT AND FTES



4.1.1 R&D PERSONNEL HEADCOUNT AND FULL-TIME EQUIVALENT BY SECTOR OF PERFORMANCE

In 2021/22, the Higher Education sector recorded the highest number of R&D personnel of 2 576, followed by Government at 659 as shown in Figure 4.2. The Not-for Profit and Business sectors accounted for the lowest R&D personnel of only 100 and 104, respectively. In the 2021/22 R&D Survey, the highest sector of performance with the highest number of FTEs was Higher Education. Although, the Government sector had a second highest number of R&D personnel it recorded a low number of personnel full-time equivalent.

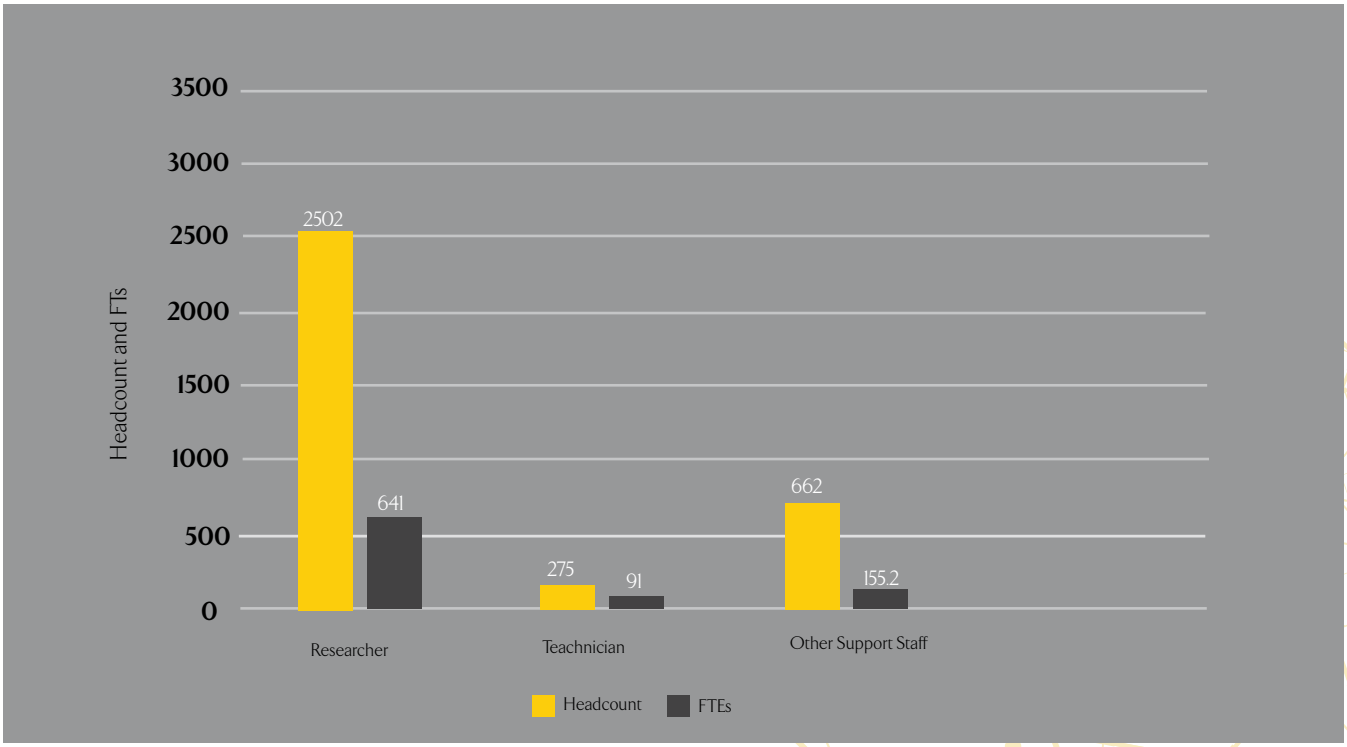
FIGURE 4.2: R&D PERSONNEL VY SECTOR (HEADCOUNT AND FTES), NAMIBIA, 2021/22



4.1.2 R&D PERSONNEL BY OCCUPATION

The majority of R&D personnel consisted of researchers, who accounted for 72.8 percent or 2502 of the totals, followed by supporting staff directly supporting R&D at 19.2 percent and technicians with 8 percent (Figure 4.3).

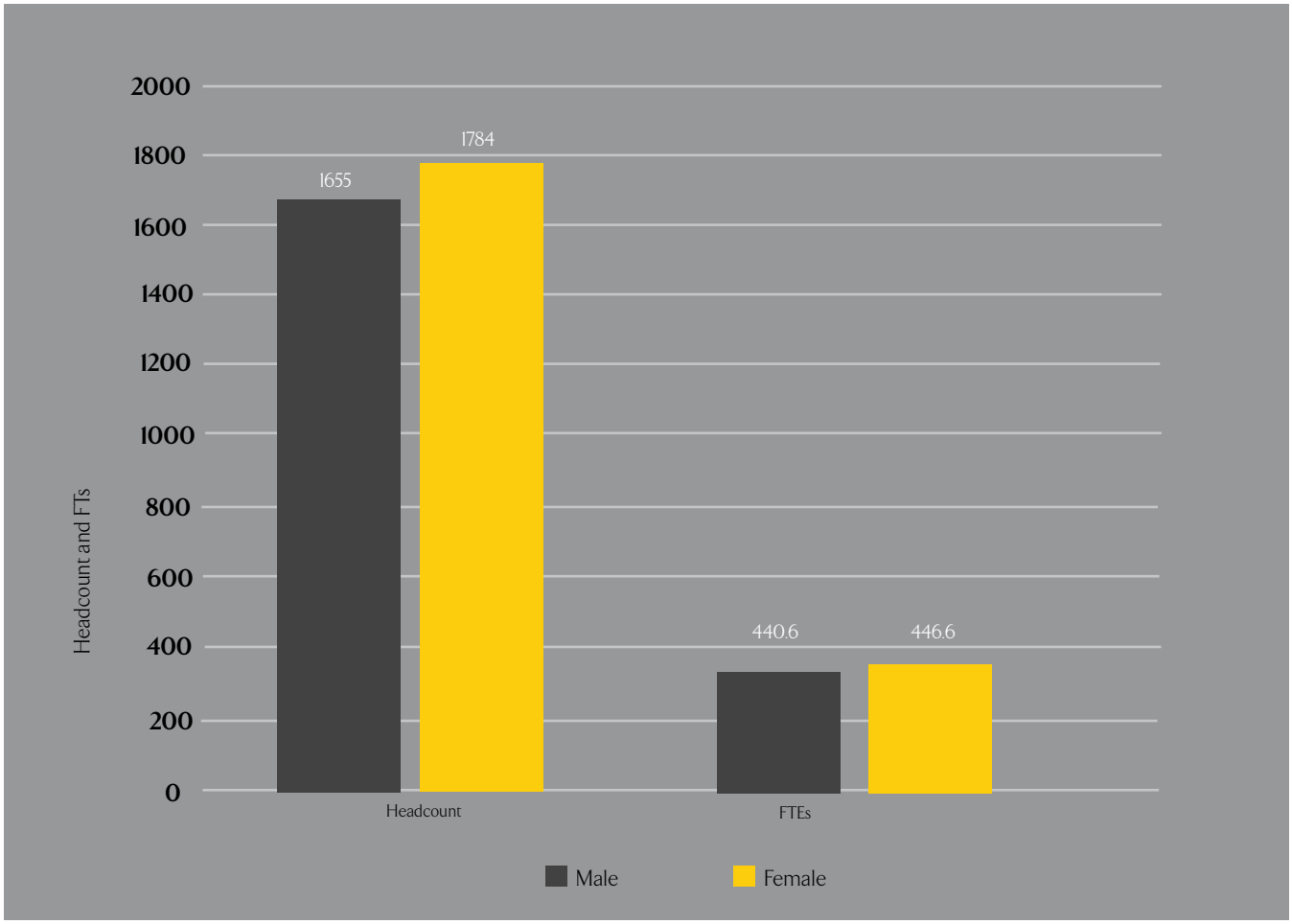
FIGURE 4.3: R&D PERSONNEL HEADCOUNT AND FTES BY OCCUPATION, 2021/22



4.1.3 R&D PERSONNEL BY SEX

The majority of R&D personnel in Namibia were females accounting for 51.9 percent of total R&D personnel in the country (see Figure 4.4).

FIGURE 4.4: R&D PERSONNEL HEADCOUNT AND FTES BY SEX, NAMIBIA 2021/22

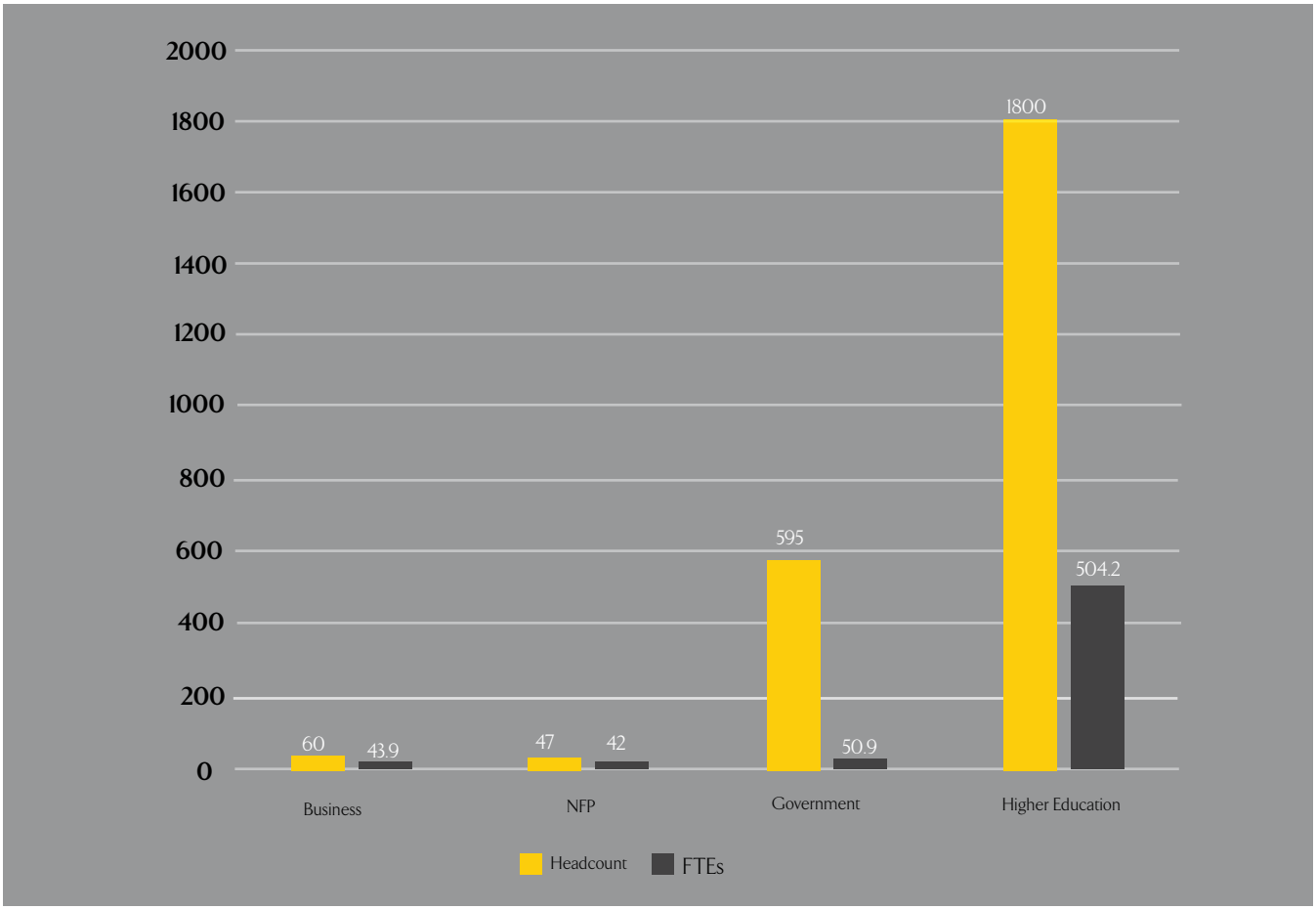


4.2 RESEARCHERS

4.1.4 Researchers headcount by sector of performance

The Higher Education sector accounted for the largest number of researchers, with a headcount of 1800 in 2021/22 and full-time equivalent of 504.2. This is a significant improvement compared to 500 researchers in 2013/14 and full-time equivalent of 167.4. The Government sector had the second highest number of researchers with 595 headcount and 50.9 fulltime equivalent. The Business sector and Not-for-Profit sector had the lowest number of researcher headcount and full-time equivalent as shown in Figure 4.5. About 79 percent of researcher full-time equivalent were from the Higher Education sector. This translates to Higher Education having researchers spending about 28 percent of their time doing research.

FIGURE 4.5: R&D RESEARCHERS HEADCOUNT AND FTES BY SECTOR OF PERFORMANCE, NAMIBIA 2021/22



4.1.5 Researchers headcount by sex

As shown in Figure 4.6, in 2021/22, Namibia had almost a similar number of male and female researchers (1238 males; 1264 females). The percentage of female share of total researchers was 49.5 percent while percentage of male share of total researcher was 50.5 percent.

FIGURE 4.6: R&D RESEARCHERS HEADCOUNT BY SEX, NAMIBIA, 2021/22

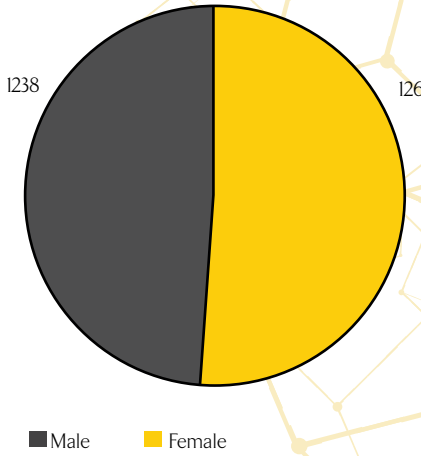
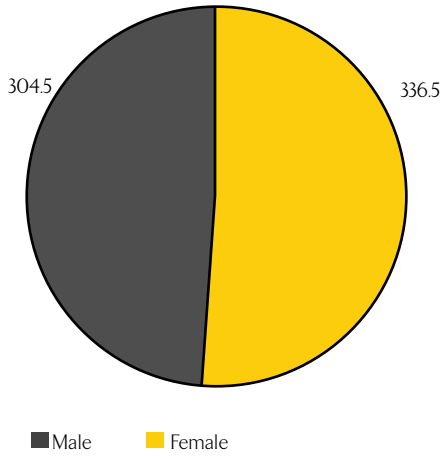


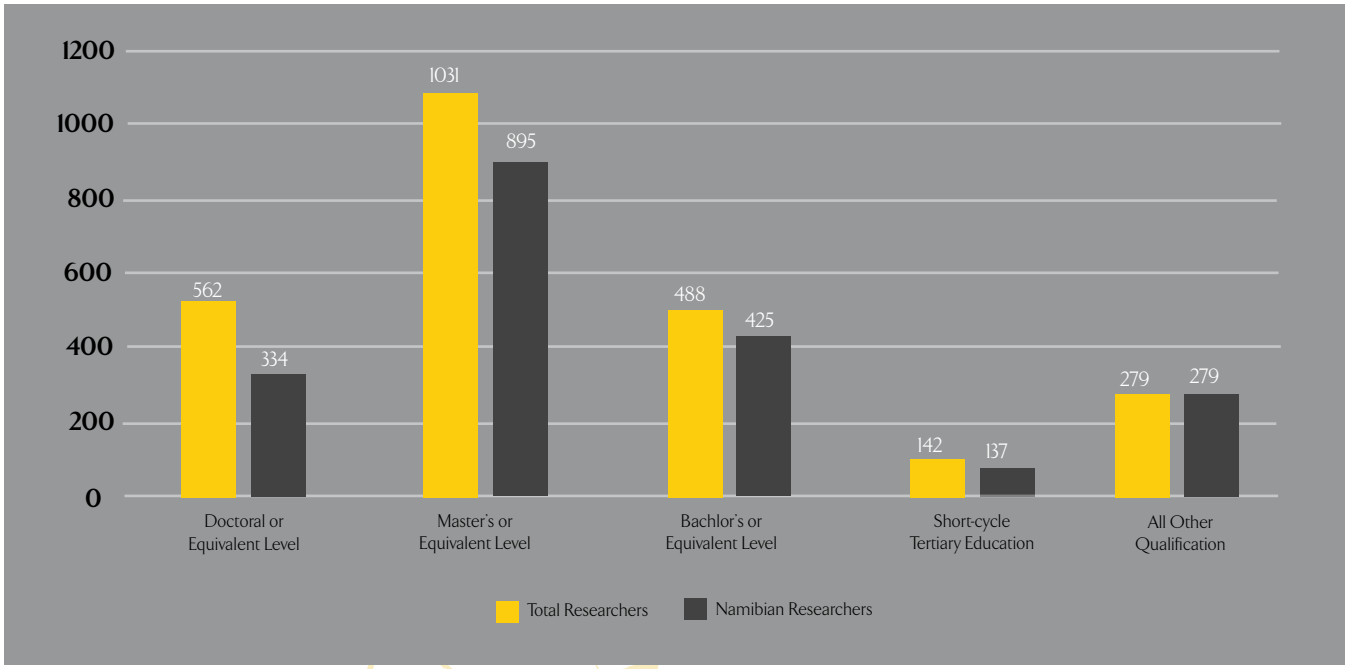
FIGURE 4.7: R&D RESEARCHERS FTES BY SEX, NAMIBIA, 2021/22



4.1.6 Researchers by qualification and nationality

In 2021/22, the researcher workforce by nationality consisted of 82.7 percent Namibian researchers (headcount) and 17.3 percent foreign researchers (headcount). In total, Namibia had a higher number of researchers with Master's degree or equivalent qualification at 41.2 percent followed by doctoral and bachelor's qualification at about 22.5 percent and 19.5 percent, respectively. The proportion of Namibian researchers with master's degree was 43.2 percent whilst with doctoral and bachelor's degrees were 16.1 percent and 20.5 percent. The 2021/22 R&D Survey revealed that the proportion of foreign researchers had decreased. The actual headcount of researchers by qualification and nationality is given in Figure 4.8.

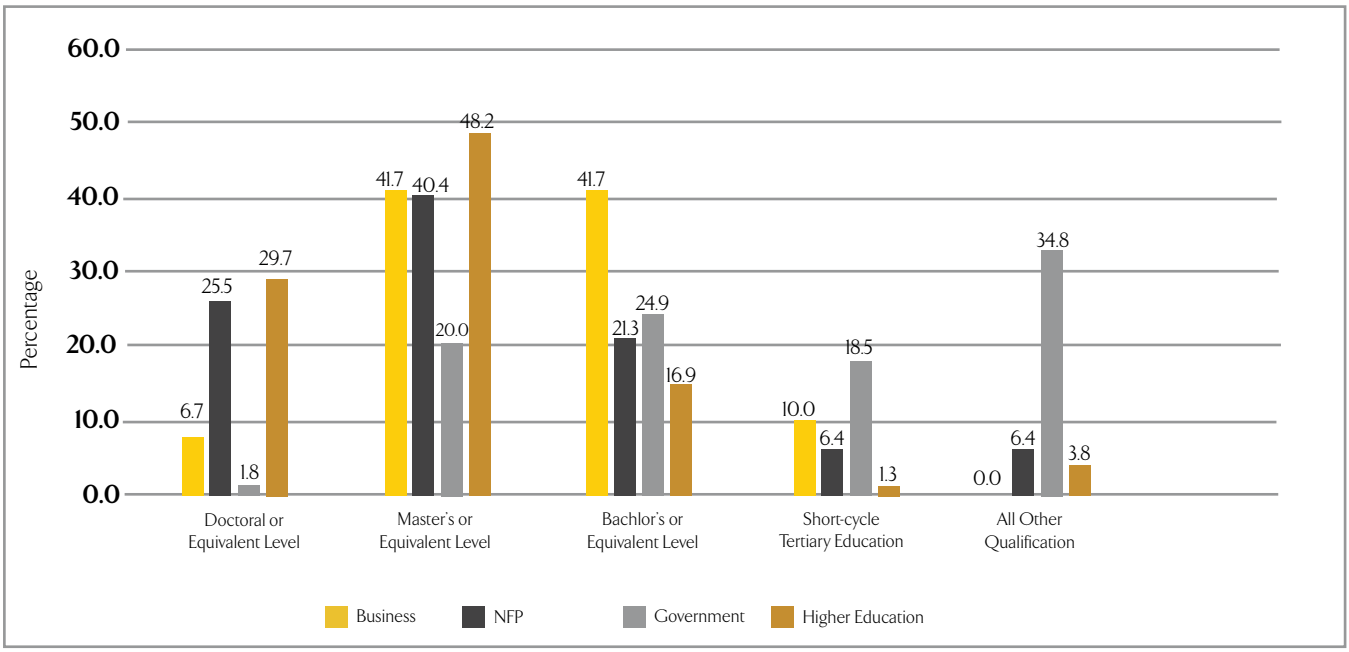
FIGURE 4.8: RESEARCHERS BY QUALIFICATION AND NATIONALITY HEADCOUNT



4.1.7 Researchers by sector and qualification

As depicted in Figure 4.9, in 2021/22, Higher Education and NFP sectors had a relative high number of researchers with doctoral qualifications (over 25%); while the Business sector had the second highest number of researchers with Master's degree following Higher Education. The Government sector had the highest number of researchers with other qualifications.

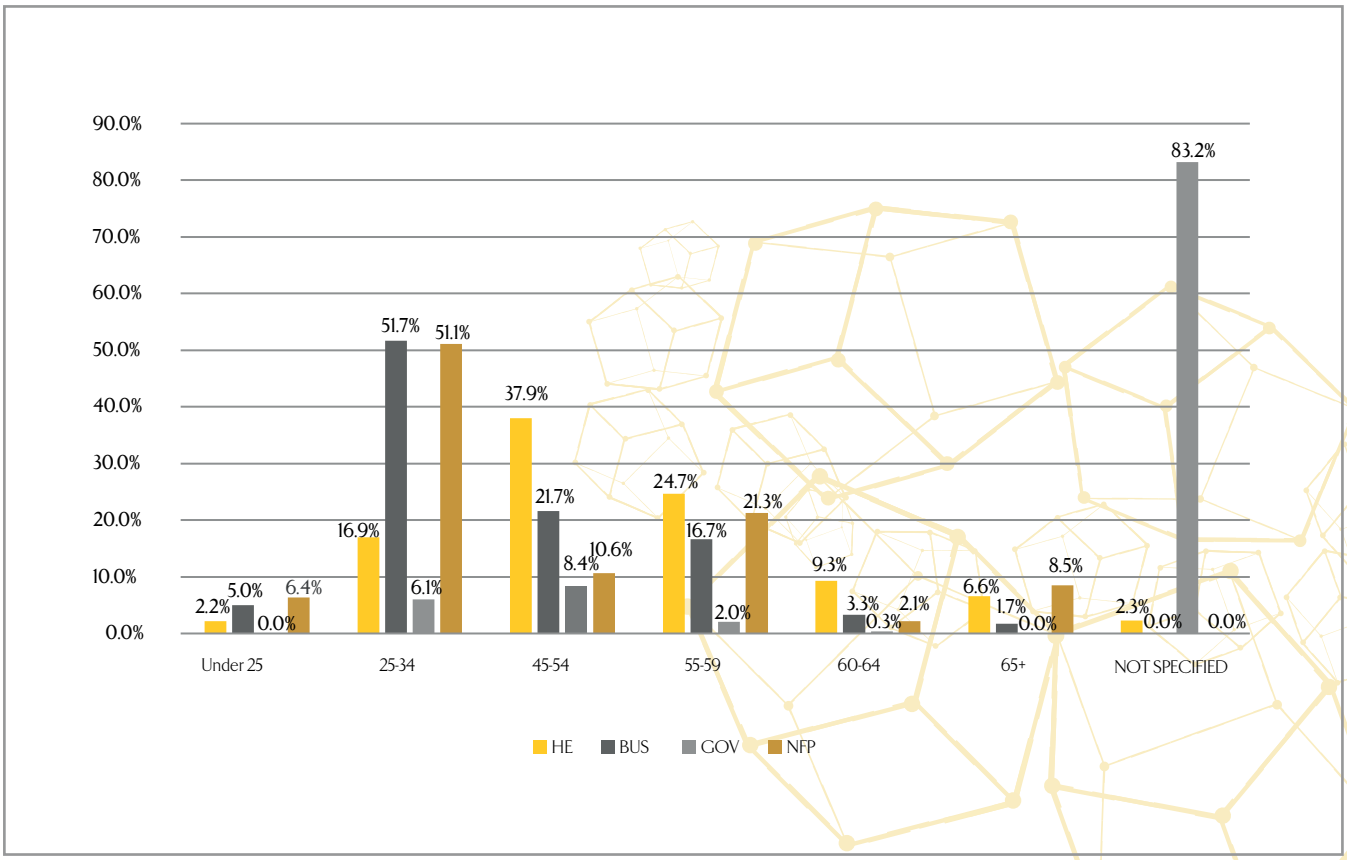
FIGURE 4.9: RESEARCHERS BY SECTOR AND QUALIFICATION (%)



4.1.8 Researchers by sector and age

The R&D Survey indicated higher number of researchers between the ages of 25 -54. Government had the highest number of researchers with no age specified (Figure 4.10).

FIGURE 4.10: RESEARCHERS BY SECTOR AND AGE (% OF HEADCOUNTS)

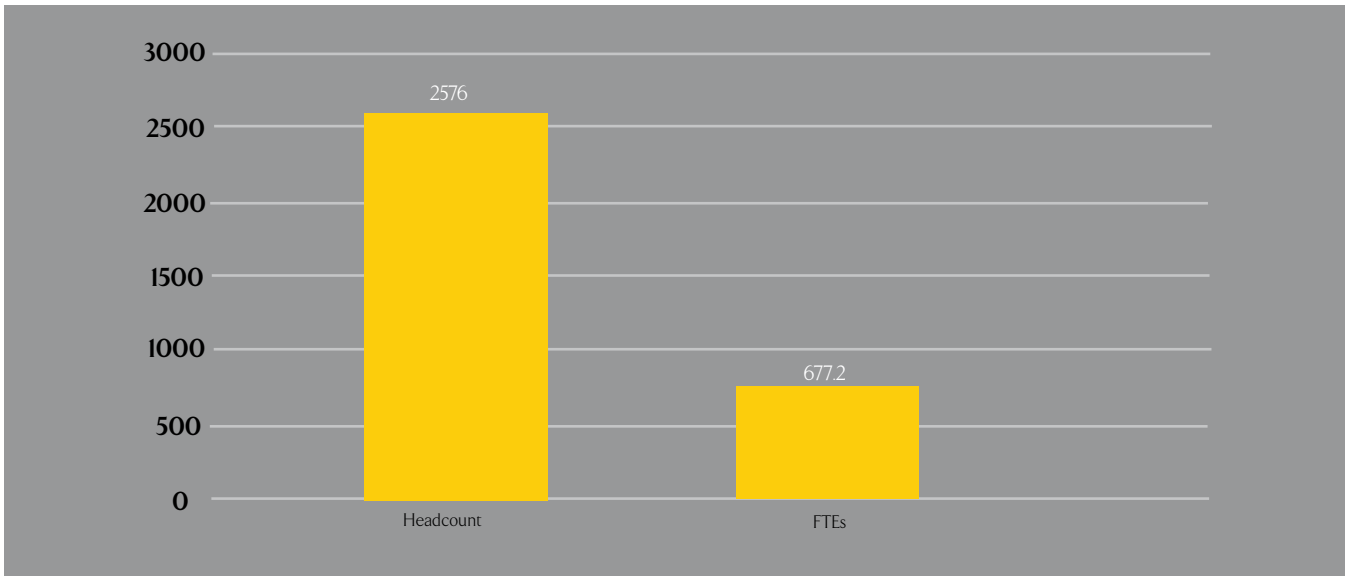


4.3 HIGHER EDUCATION R&D PERSONNEL

4.3.1 Higher Education R&D personnel: Headcount and FTEs

The Higher Education sector accounted for the highest R&D personnel at 2576 (headcount). Higher Education R&D personnel spent 26.3 percent of their time on research in 2021/22 as shown in Figure 4.11.

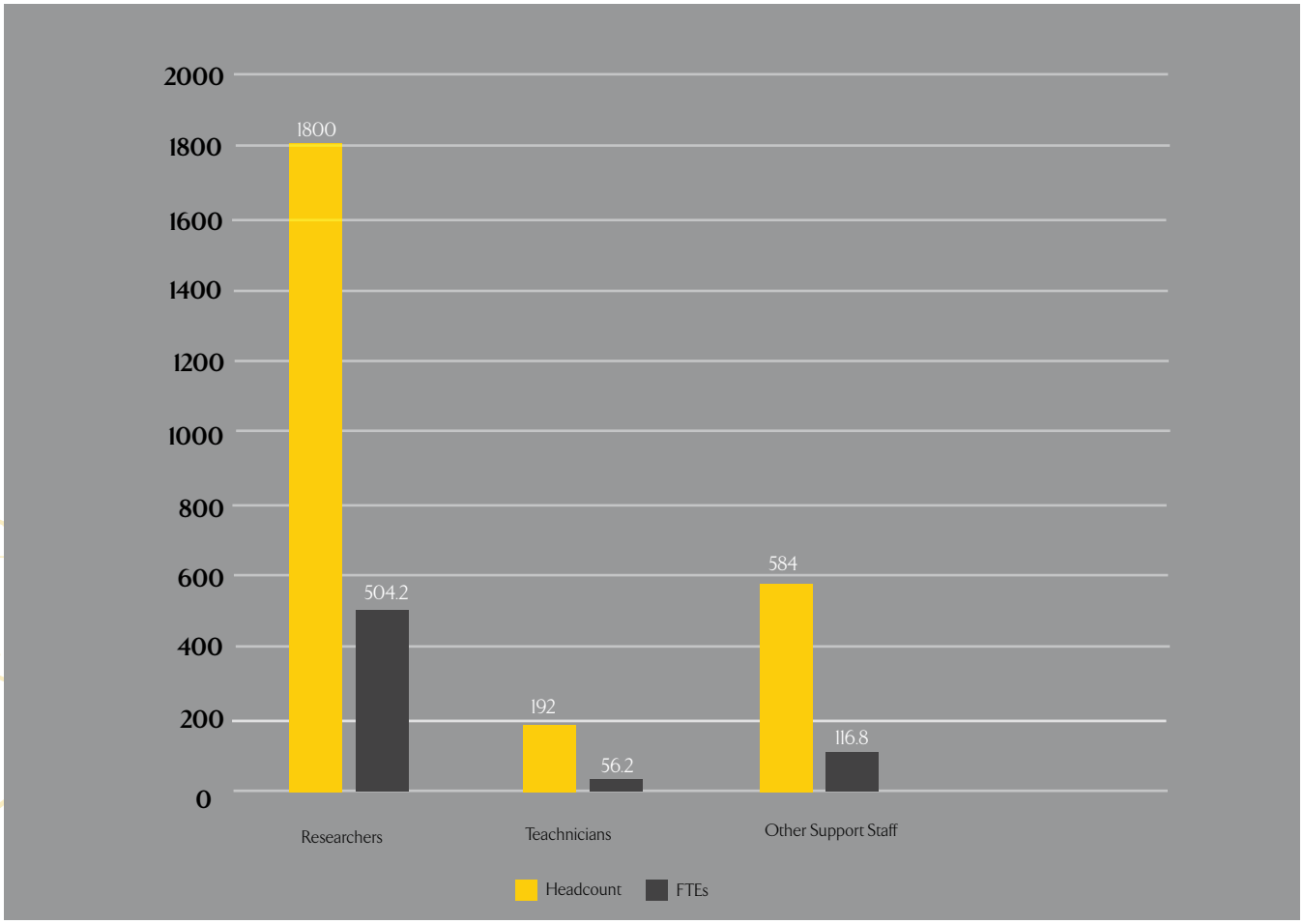
FIGURE 4.11: HIGHER EDUCATION PERSONNEL HEADCOUNT AND FTES



4.3.2 Higher Education Researchers

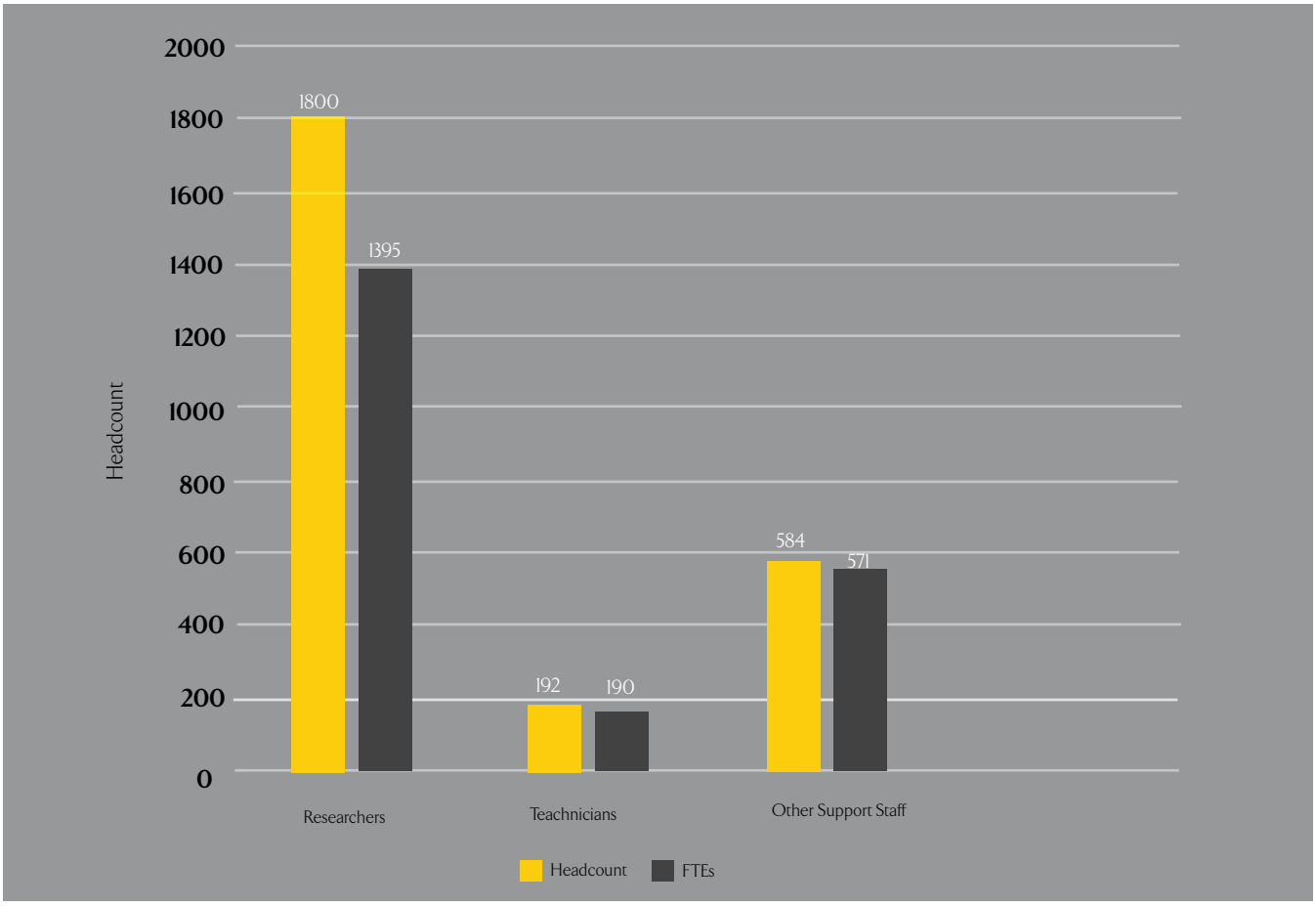
As shown in Figure 4.12, in 2021/22, Higher Education sector had the largest number of researchers at 1800 headcount who spend 28 percent of their time in research.

FIGURE 4.12: HIGHER EDUCATION RESEARCHERS (HEADCOUNT AND FTES) BY OCCUPATION, NAMIBIA, 2021/22



Out of the 2576 R&D personnel in Higher Education sector, 2 156 (83.7%) were Namibians. Almost all technicians and R&D supporting staff were Namibian, 99.0 percent and 97.8 percent, respectively, while only 22.5 percent of researchers were foreign nationals (Figure 4.13).

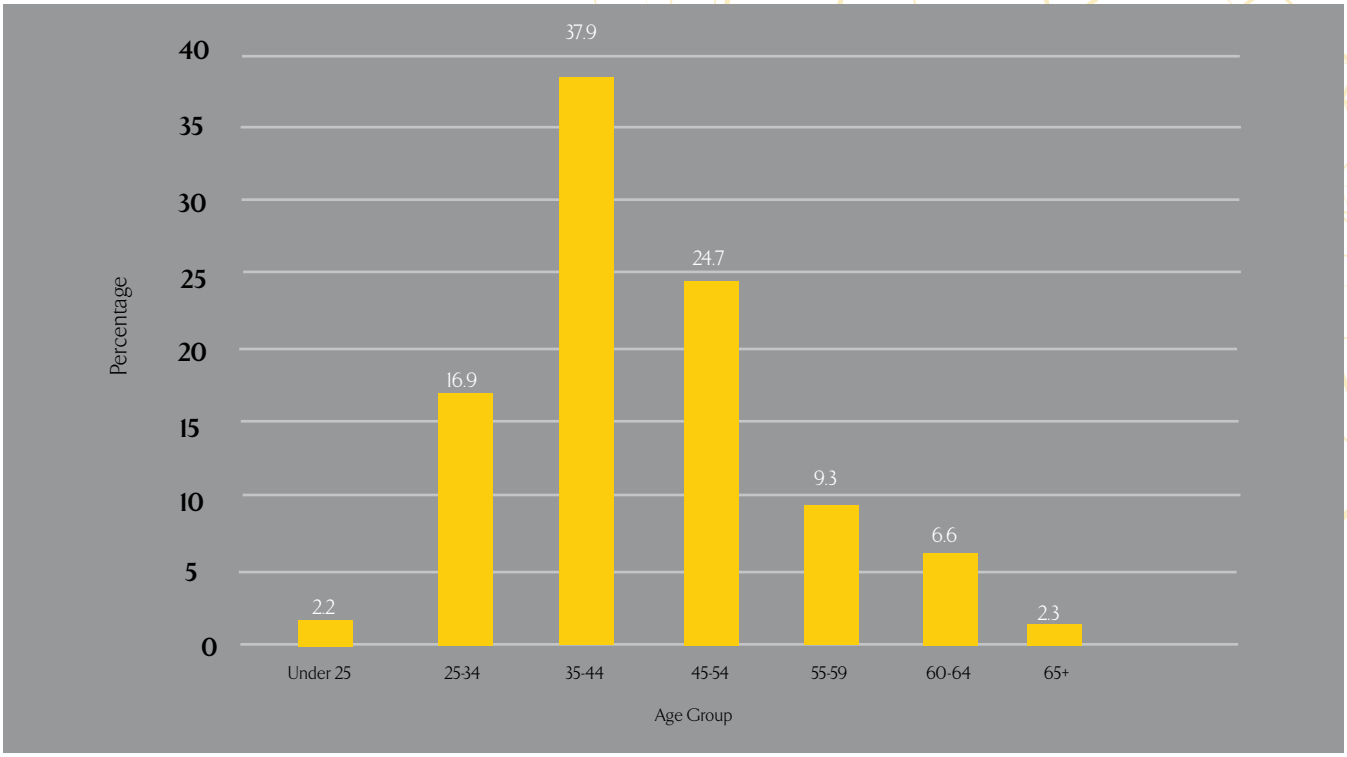
FIGURE 4.13: HIGHER EDUCATION RESEARCHERS (HEADCOUNT) BY OCCUPATION AND NATIONALITY, NAMIBIA, 2021/22



4.3.3 Higher Education Researchers by Age

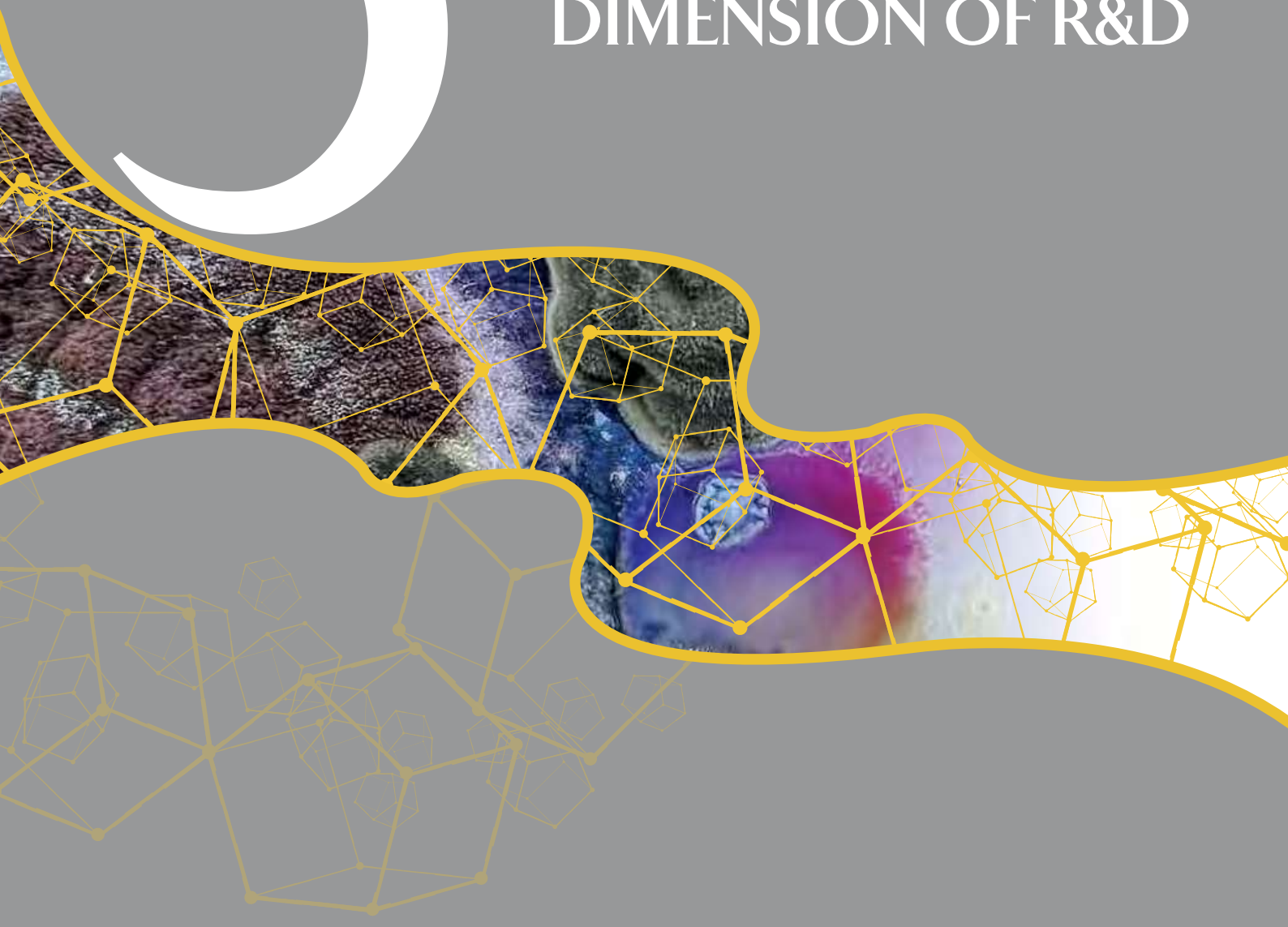
FIGURE 4.14 shows that the Higher Education sector has more researchers between the age of 35- 44 years. The Higher Education sector had younger researchers compared to 2013/14 when most researchers were recorded in the age group 45-54. The sector also recorded 2.3 percent of researchers aged 65 years and above.

FIGURE 4.14: HIGHER EDUCATION RESEARCHERS BY AGE (%)



5

GEOGRAPHICAL DIMENSION OF R&D

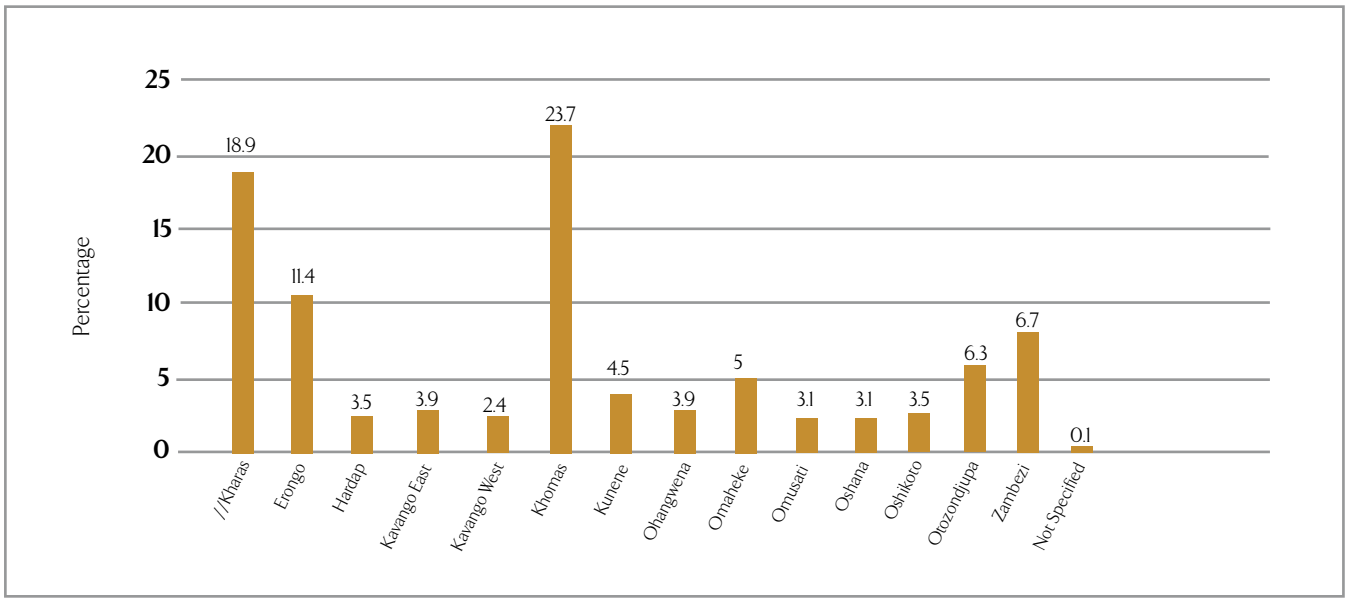


CHAPTER 5
GEOGRAPHICAL DIMENSION OF R&D

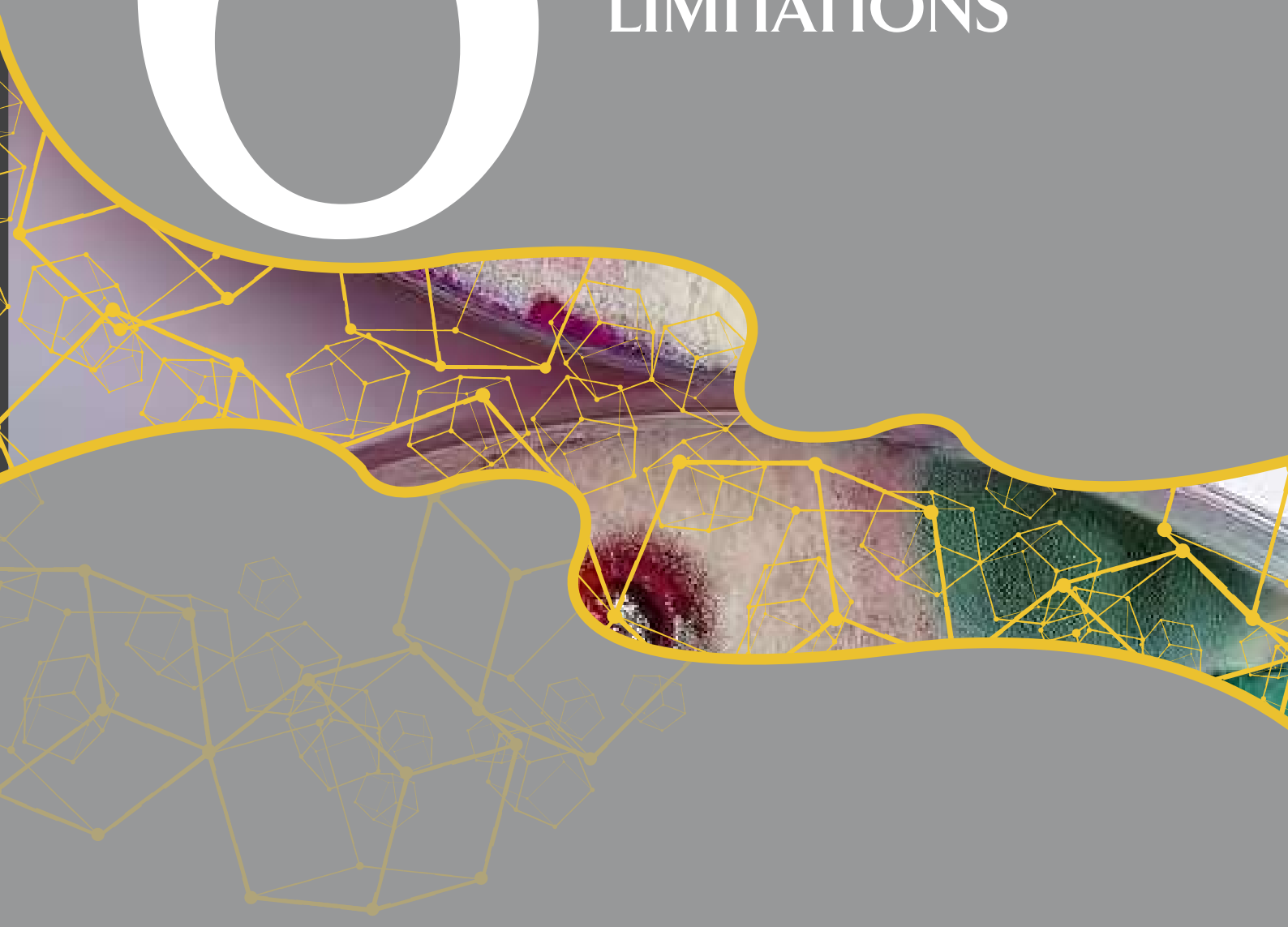
5.1 R&D EXPENDITURE BY REGION

R&D expenditure in Namibia is concentrated in Khomas. //Kharas and Erongo regions. Khomas was responsible for about N$316 million (23.7%) of total GERD followed by //Kharas region with N$250 million (18.9%) and Erongo region with N$151 million (11.4%). Together these three regions accounted for 54 percent of total GERD in 2021/22. Kavango West region accounted for the lowest GERD at merely 2.4 percent (see Figure 5.1).

FIGURE 5.1: R&D EXPENDITURE BY REGION (%)



6 LIMITATIONS



CHAPTER 6
LIMITATIONS

6.1 Methodology Adherence to Frascati Manual (2015) Guidelines

The methodology employed for the Research and Development (R&D) survey adheres to the guidelines provided by the Frascati Manual (2015), ensuring standardization for international comparability. A section of the questionnaire has been augmented to include R&D collaboration, including interactions with informal sectors and custodians of traditional knowledge to have a more detailed analysis of funding flows than the first R&D report. However, due to incomplete data and inadequate reporting on income distribution, this report omits the analysis of sources of funds for in-house/intramural R&D.

6.2 Basis of Findings on Self-Reported Data

The findings explained in this report are derived from data submitted by respondents, contingent upon their comprehension of the survey instrument, hence this report's conclusions are grounded on self-reported data. Although the requisite information could be attainable, the subjective understanding regarding some definitions outlined in the Frascati Manual introduces the prospect of subjective self-report data.

6.3 Challenges in Interpreting R&D Personnel FTE and Survey Responses

Certain institutions may assert that all staff members engage in research, thereby equating their R&D personnel Full-Time Equivalent (FTE) to or near 100% as per the caution in the Frascati Manual that this tends to happen.
Furthermore, "in-house" R&D was another area where misunderstanding and discrepancies may arise according to the Frascati Manual, such as an overstatement of R&D personnel FTE due to a question concerning the performance of "in-house" R&D during the preceding financial year. Instances were identified where institutions, typically involved in in-house or funded R&D, misinterpreted the question, responding negatively and consequently truncating the survey. The handling of this question aligns with the specifications in the Frascati Manual.

Data verification and triangulation challenges were also encountered in certain respondent institutions, where understanding and access to pertinent data sources were restricted. Consequently, the public general research funds, encompassing the R&D funding share received by public entities from their respective ministries to support comprehensive research activities (e.g., the General University Fund - GUF), were not consistently reported by all public entities in sections of the questionnaires and is acknowledged in the Frascati Manual as a challenge.

6.4 Focal Point Challenges in Data Collection

Focal Point challenges were identified, as the individuals responsible for supplying data encountered difficulties in collating financial, R&D and Human Resource information. Fragmented and decentralized data emerged, particularly in entities housing numerous satellite research centres (e.g., Universities and Ministries overseeing agriculture, fisheries, and environment). The limited availability of data adversely affected the analysis.

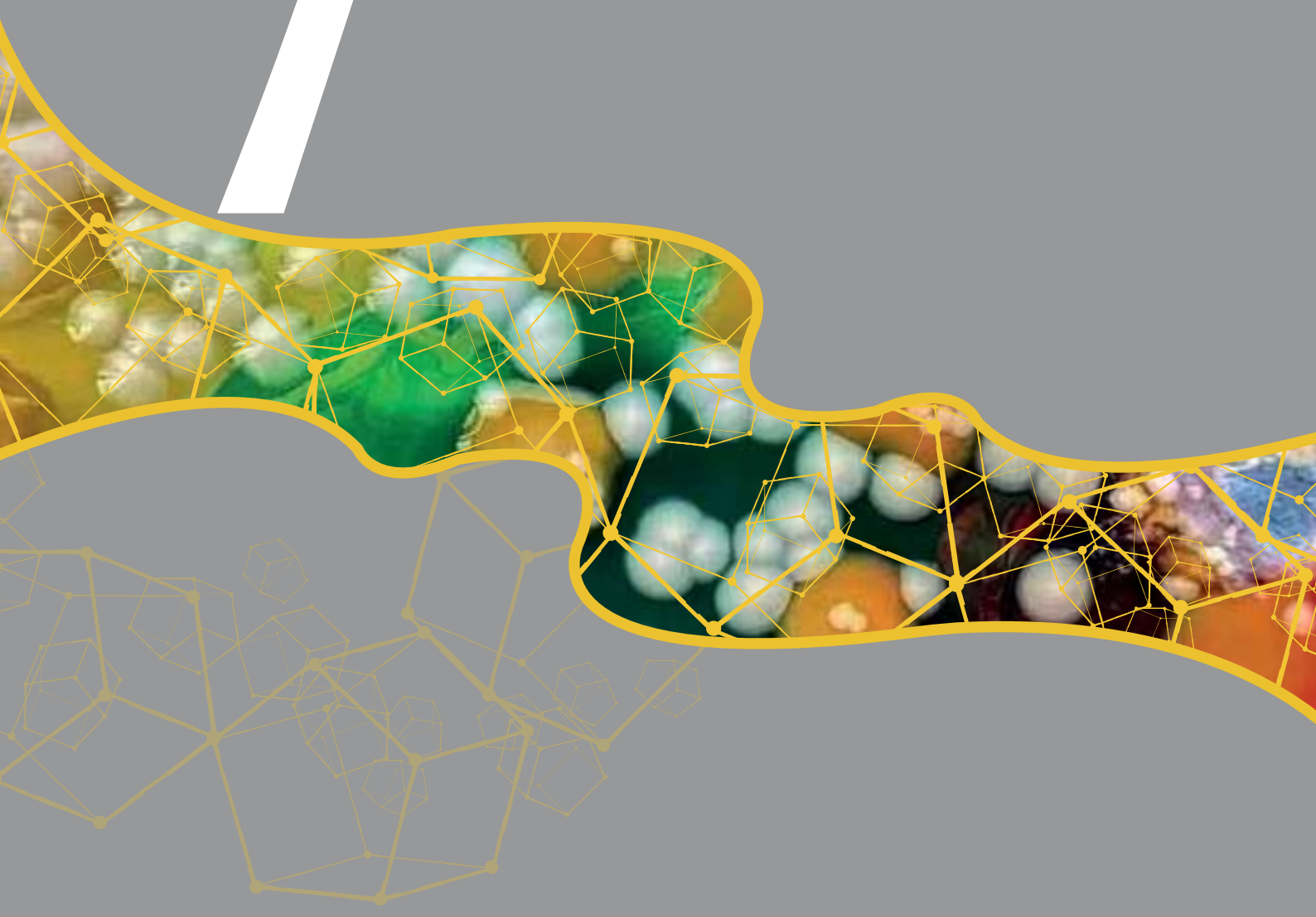
6.5 Challenges in Measuring Full-Time Equivalent (FTE)

Measuring of Full-Time Equivalent (FTE), particularly in Higher Education and Government research sectors, posed challenges due to institutional arrangements. The Frascati Manual acknowledges the difficulty in discerning the time allocated to R&D activities by individual workers or groups of contributors compared to other pursuits.

6.7 Exclusion of NCRST and its Impact on Data

The data collection on R&D expenditure employed the R&D performer-based approach as outlined in the Frascati Manual. The National Commission on Research, Science and Technology (NCRST) is identified as primarily an R&D funding agency and not a R&D performer according to the definition in the Frascati Manual and thus excluded. The R&D funding disbursed by NCRST are accounted for under the R&D performing units.

7 RECOMMENDATIONS



CHAPTER 7
RECOMMENDATIONS

The Report recommends strengthening coordination at the National Commission on Research, Science and Technology (NCRST) to facilitate and enhance informed contributions and presentations by the Ministry of Higher Education, Technology and Innovation (MHETI) during regional and continental forums, such as the SADC Ministerial meetings and AU STC-ESTI sessions. It is further recommended that these presentations encompass Gross Expenditure in Research and Development (GERD) sub-indicators, including personnel and expenditure details, along with essential Innovation indicators. This strategic approach aims to position Namibia prominently in regional and continental discussions on science, technology, and innovation.

7.1 Recommendations on IDENTIFICATION OF FOCAL POINTS

Designate specific sectoral units as focal points for data collection, proficient in providing detailed financial, Research and Development (R&D), and Human Resource information. Integrate collected data directly into a centralized database or an Information Management System for enhanced institutional efficiency in data collection. There is a need to increase awareness of the importance of self-reported data, ensuring it includes verifiable sources. Additionally, monitor extramural expenditure, ensuring that payments made to other institutions to perform R&D are accurately recorded as internal R&D expenditures in the recipient institutions.

7.2 Recommendations on DATA COLLECTION AND AWARENESS

Recommendations regarding data collection and awareness are reflected below:

- Implement targeted training programs and awareness campaigns to improve response rates, particularly regarding the source of funds.
- Refine the data collection instrument and localise the indicators to be relevant to Namibia's specific requirements.
- Regularly update the database of R&D performing institutions to ensure inclusivity and improve response rates.
- Besides self-reporting, explore additional sources to strengthen data acquisition.
- Engage the Namibia Statistics Agency (NSA) in the data collection process to enhance the reliability and comprehensiveness of national Science, Technology, and Innovation (STI) indicators.
- Extend this collaboration to include public universities for a more holistic representation of the R&D landscape.

8 CONCLUSION AND ACKNOWLEDGEMENT

CHAPTER 8
CONCLUSION AND ACKNOWLEDGEMENTS

The second R&D survey has been anticipated for a while. R&D serves not just to drive innovation but also to facilitate the adoption of existing technologies. The indicators derived from R&D are crucial for assessing a country's progress and reporting. Investing in R&D is a fundamental factor for economic growth, enhancing the competitiveness of nations and organizations globally. This investment supports the development of new industries, improves productivity, and generates high-quality jobs.

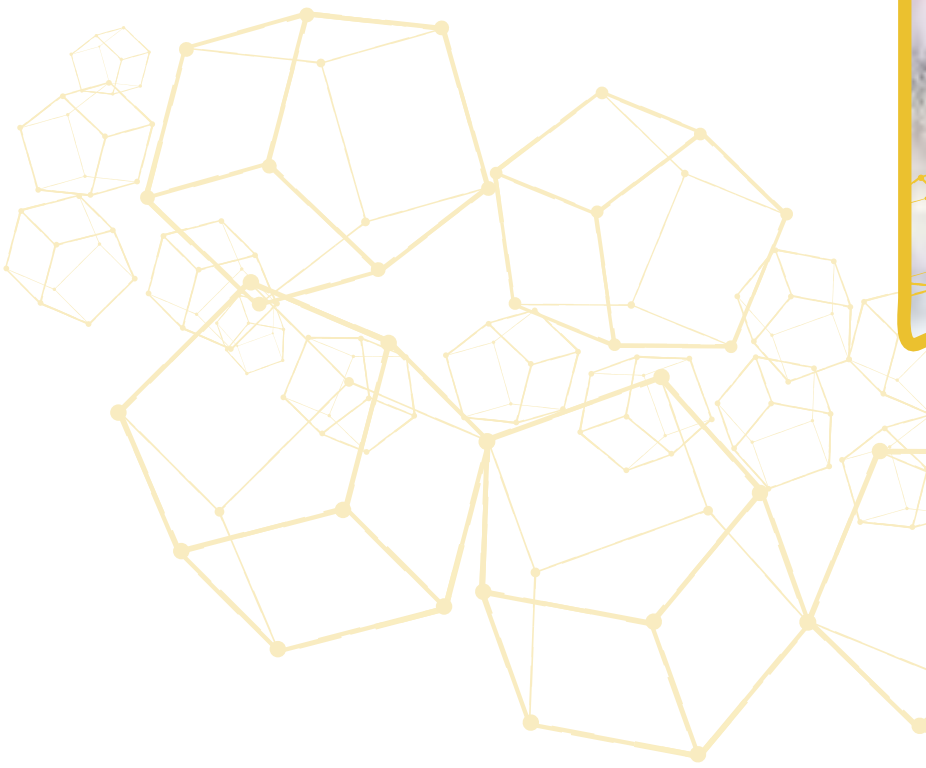
The second National R&D Survey was conducted with the support of the Swedish International Development Cooperation Agency (SIDA) and the UNESCO Country Team (UNCT) in Namibia. The project "Strengthening Science, Technology and Innovation Systems for Sustainable Development in Africa", funded by SIDA, focused on delivering the aspirations of the 2017 UNESCO Recommendation on Science and Scientific Researchers (RS||SR), in six African countries, including Namibia. The main objective of the project is to strengthen the STI systems and governance within UNESCO's global framework for monitoring, policy support and advocacy for (RS||SR). The survey was conducted in collaboration with the University of Namibia (UNAM), which was selected through a competitive bidding process to lead the project.

Special appreciation goes to the New Partnership for Africa's Development (NEPAD) Africa Science, Technology and Innovation Indicators Initiative (ASTII) team and the South African Department of Science and Technology (DST) through the interactions with the Centre for Science, Technology and Innovation Indicators (CeSTII), Human Science Research Council (HSRC), in particular Mrs. Natasha Saunders and Mrs. Natalie Vlotman, who assisted with the effective training of the enumerators.

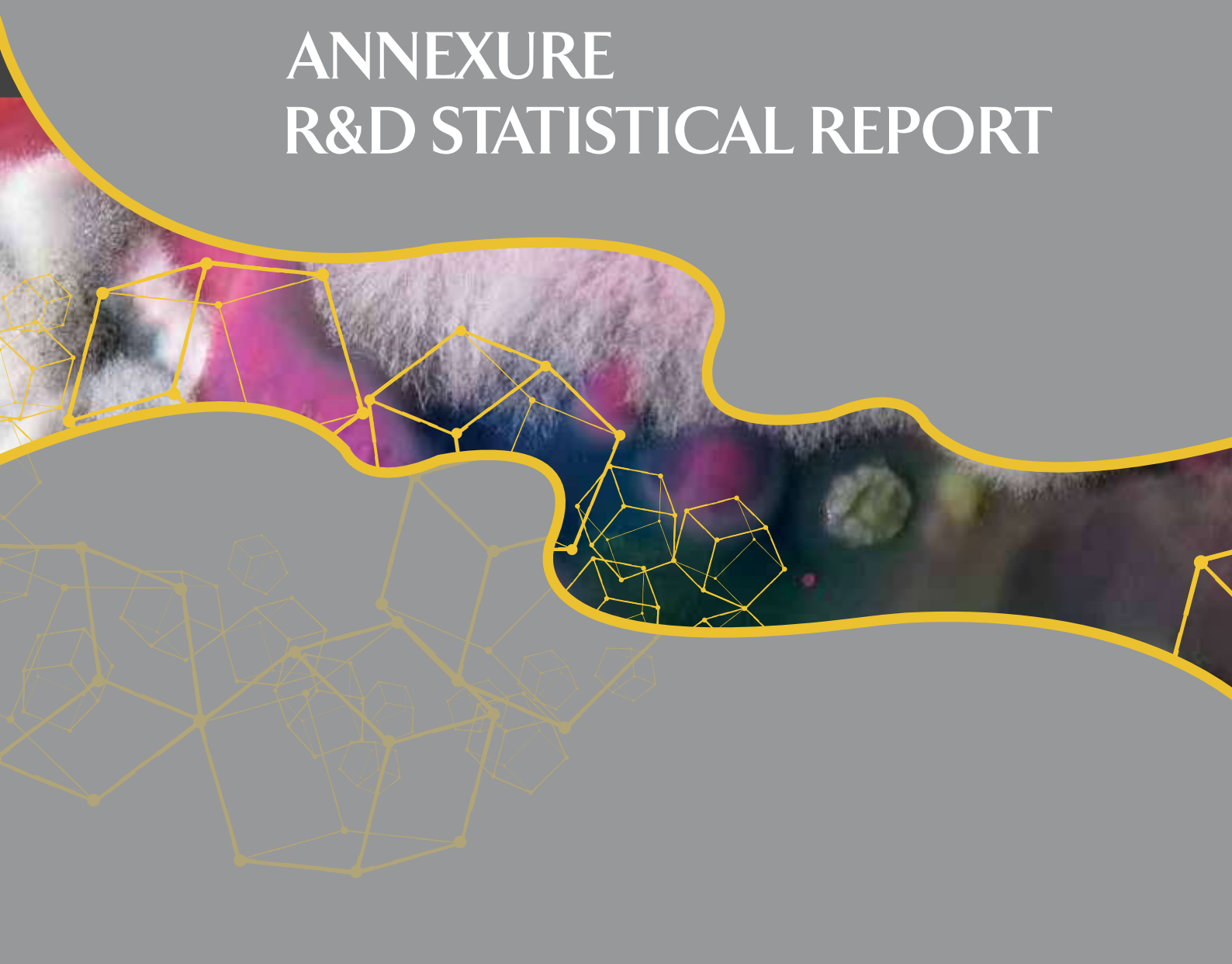
The NCRST also acknowledges and extends its gratitude to individuals and organisations in Namibia who participated in the 2021/22 national survey of R&D. In particular, the participation and contribution of various private organisations in the business, government ministries, offices and agencies, higher education institutions and not-for-profit sectors are highly appreciated.

Appreciation is also expressed to the enumerators drawn from the student population of the University of Namibia, who transversed the country to collect the primary data. Further appreciation is extended to NCRST and UNAM staff for their diligence and commitment to implement the survey and conduct the statistical analysis.

Finally, acknowledgement and appreciations are extended to the Namibia Statistics Agency who provided the quality assurance in the methodology used as well as accreditation of the data and the report.



ANNEXURE
R&D STATISTICAL REPORT



ANNEXURE:
R&D STATISTICAL REPORT

1. METHODOLOGY

On behalf of the National Commission on Research, Science and Technology, the University of Namibia conducted the National Survey of Research & Experimental Development 2021/22 according to the OECD guidelines presented in the Frascati manual. The Frascati Manual (OECD, 2002) defines research and development as the creation of new knowledge or the application of existing knowledge to improve products, processes and/or services to affect economic outcomes.

Users and uses

The survey provides baseline national indicators for R&D. The key end users of the R&D survey are the Government of the Republic of Namibia (GRN), policy makers, development partners, stakeholders from the sectors identified in this survey (Government, Higher Education, Business, Not-for-profit) as well as the Namibian public. The survey in particular meets the needs of the GRN, who require accurate, up to date and reliable data on indicators to benchmark and monitor national policies; national investment in research and development; and measure the research output in terms of publications and creation of new knowledge. Other users are stakeholders who need R&D data to answer questions such as do I need to invest in R&D or Higher Education; in which areas should I invest predominantly; in which areas am I already investing, which are important economic sectors, in mining, agriculture, industry, services, what are national and regional peculiarities (health, environment, utilities, defence); are there sufficient links of universities & research institutes to industry; and most importantly what are the factors hampering STI in the country?

Strengths and limitations

The R&D survey was targeted at the Higher Education sector, the private Non-profit sector, the Government sector and Business enterprises, as defined in the Frascati manual. The Namibian R&D survey was conducted using the census-based survey approach for the Not-for-profit sector, Government sector and Higher Education sector and Business sector as per the list of entities obtained from NCRST. The sectors were surveyed during the period of 26th September – 2nd December 2021/22. At the onset of the survey, a total of 125 entities were identified as potential R&D performers as per the NCRST database (73 Business, 21 Government, 18 Not-for-profit, 13 Higher Education). A total of 97 entities were successfully interviewed in the survey. The response rate of the R&D survey was 77.6%. The results of the R&D survey are relevant to direct the development agenda of Namibia. Governments in Africa have noted the importance of conducting R&D surveys to obtain basic /core indicators to formulate evidence-based policies and allow benchmark policies based on engines of economic growth.

Training workshop

The training workshop was well conducted, and the methodology of the workshop involved presentations and discussions. The survey was carried out under confines of the Namibia Statistics Act 2011, specifically following its code of practice requirements (Section 34, Statistics Act No 9 of 2011). Through this collaboration, all information collected that could be linked to identified individuals' organisation were kept strictly confidential as per the Statistical Act, 2011 (Act No 9 of 2011). The survey was conducted in close collaboration with key stakeholders:

- CESTII to ensure that the data generated from the survey meets standards to allow international comparability.
- The University of Namibia (UNAM) for data collection, data analysis and writing of the statistical report.

Organisation and preparation

Legal basis Recruitment and Training
Together with the researchers, enumerators received training from partners Centre for Science, Technology and Innovation Indicators (CeSTII, South Africa) on data collection using the Frascati manual.

Thirteen enumerators were recruited to participate in the surveys. Additionally, individual letters were written to various organizations/ institutions to sensitise them about the survey. The individual letters clearly explained the objectives of the survey, when it will be conducted, the survey methodology and organisation unit that was expected to provide information.

Field Survey supervisory structure

Field Organisation and Supervision
Field organization plays a crucial role in any survey. A research team consisting of three senior researchers worked together to ensure that field operations started and ended without bottlenecks. Some of the processes which were addressed during planning included:

- Establishing contacts with focal persons in institutions and enterprises
- Recruitment and remuneration of enumerators
- Logistical arrangements in terms of transport and communication
- Overall coordination of all other functions associated with fieldwork such as continuous monitoring of enumerators progress and challenges

Field supervisions and Consistency check

Enumerators were trained to probe until they were satisfied with the response given by respondents before they recorded them on the questionnaire. Questionnaires that required further clarification were identified and handed back to enumerators for follow-up.

Field data capture and transcription

The R&D survey used the mixed method of recording respondents' answers on the questionnaire as well as using tablets. The questionnaires included codes for specific items like Field of Science (FoS) and Socio-Economic Objectives (SoEs). Enumerators were also trained on reconciling collected information especially percentages and headcount. Data collection commenced in Windhoek. Each enumerator was assigned a specified number of enterprises to interview in Windhoek. This ensured oversight by supervisors and effective communication with respondents especially at the beginning of the survey.

The enumerators made appointments and developed a time schedule for interviews with participating enterprises. During the interviews, the purpose of the R&D survey was explained as well as the questionnaires with guidance on how to complete them. In instances where interviews were not completed, questionnaires were left with the focal persons in the organizations, to collect and verify information required. Focal persons requesting electronic questionnaires were sent the forms via email. Weekly follow up was conducted with focal persons, where necessary to further explain the questionnaire. Researchers intervened where enumerators were not able to contact the focal persons to facilitate the interviews or where responses were not forthcoming by further explaining the importance of the census data in national planning. In cases where a hard copy of questionnaire was completed, enumerators entered information on the tablet.

Data Processing and Quality assurance

Questionnaire receipt and handling
This is the process of receiving the questionnaires from enumerators. Each enumerator was assigned to a supervisor who manually checked for consistency and completeness of entries before the specific interview is recorded as complete where a hard copy was used. Additionally, the dataset of survey records was continuously checked, and incomplete entries were flagged for follow up. Supervisors also reconciled the number of questionnaires dispatched with records in the office. Incomplete interviews due to refusals were also returned to be accounted for. Questionnaires which were completed electronically were printed, checked for consistency and completeness.

Data security and Privacy

To maintain data security, all enumerators were given unique usernames and passwords for tablets which were issued to them for completion of in person interviews. Questionnaires completed in hardcopy were transcribed into electronic questionnaires. All questionnaires completed electronically were uploaded onto a secure cloud server via tablet.

Quality assurance

Data quality assurance is one of the cornerstones of a good statistical data system. In this survey, efforts were made during the conduct of the survey to minimize the non-responses, incompleteness and inaccuracy that may affect the quality of data.

R&D and technical support

Financial support was given by NCRST who made sure that training on data collection was provided for supervisors and enumerators. The training provided technical skills to enumerators, NCRST, and UNAM staff and covered the following aspects:

- Understanding of R&D definitions and concepts in relation to STI Indicators
- Methodology and procedures for data collection
- Methodologies and frameworks for the measurement of Research and Experimental Development (R&D)
- R&D Survey instruments: Standard questionnaires
- Processing R&D survey data and analysis and dissemination

2. TABLES OF STATISTICAL ANALYSIS OF THE R&D DATA

TABLE 8 (A1): TOTAL IN-HOUSE R&D EXPENDITURE PER SECTOR 2013/14 & 2021/22

SECTOR	2013/14		2021/22	
	N$	%	N$	%
Business	53 884 800	11.4	288 171 000	21.7
NFP	36 081 270	7.6	33 073 000	2.5
Government	216 614 457	45.9	43 567 000	3.3
Higher Education	165 153 307	35.0	964 005 000	72.5
TOTAL	471 733 834	100.0	1 328 816 000	100

TABLE 9 (A2): HEADCOUNT OF R&D PERSONNEL BY SECTOR (2021/22)

Sector	Researchers	Technicians	Other support staff	Total	%
Business	60	19	25	104	3.0
NFP	47	21	32	100	2.9
Government	595	43	21	659	19.2
Higher Education	1800	192	584	2576	74.9
TOTAL	2502	275	662	3439	100.0

TABLE 10 (A3): FTE OF R&D PERSONNEL BY SECTOR (2021/22)

Sector	Researchers	Technicians	Other support staff	Total	%
Business	43. 9	7.9	14.4	66.2	7.5
NFP	42.0	11.3	12.3	65.6	7.4
Government	50.9	15.6	11.7	78.2	8.8
Higher Education	504.2	56.2	116.8	677.2	76.3
TOTAL	641.0	91.0	155.2	887.2	100.0

TABLE 11 (A4): TOTAL GERD BY TYPE OF RESEARCH 2021/22 (N$ '000)

Type of Research	Business		Not-for-profit		Government		Higher Education		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Basic Research	9 014	3.1	21 039	63.6	14 154	32.5	160 757	16.7	204 964	15.4
Applied Research	26 985	9.4	12 034	36.4	18 250	41.9	638 212	66.2	695 481	52.3
Experimental Research	252 172	87.5	0	0	8 881	20.4	165 036	17.1	426 089	32.1
Not Specified	0	0	0	0	2 282	5.2	0	0	2 282.0	0.2
TOTAL	288 171	100.0	33 073	100.0	43 567	100.0	964 005	100.0	1 328 816	100.0

TABLE 12 (A5): REGIONS SPLIT OF R&D 2021/22 (N$ '000)

Region	Business		Government		Not-for-profit		Higher Education		TOTAL-	
	N$	%	N$	%	N$	%	N$	%	N$	%
//Kharas	194.052	67.3	7 165	16.4	921	2.8	48 418	5.0	250 555	18.9
Erongo	44 198	15.3	2 335	5.4	5 047	15.3	99 681	10.3	151 261	11.4
Hardap	489	0.2	1 824	4.2	330	1.0	44 296	4.6	46 939	3.5
Kavango East	489	0.2	2 277	5.2	0	0.0	49 293	5.1	52 059	3.9
Kavango West	489	0.2	2 293	5.3	0	0.0	28 682	3.0	31 464	2.4
Khomas	24 150	8.4	8 535	19.6	1 721	5.2	281 175	29.2	315 580	23.7
Kunene	144	0.1	3 759	8.6	2 864	8.7	53 087	5.5	59 854	4.5
Ohangwena	239	0.1	1 410	3.2	508	1.5	49 074	5.1	51 231	3.9
Omaheke	239	0.1	1 180	2.7	948	2.9	64 360	6.7	66 727	5.0
Omusati	424	0.1	2 316	5.3	352	1.1	37 592	3.9	40 683	3.1
Oshana	5 394	1.9	2 568	5.9	352	1.1	32 695	3.4	41 008	3.1
Oshikoto	10 694	3.7	2 816	6.5	352	1.1	32 585	3.4	46 447	3.5
Otjozondjupa	5 275	1.8	3 053	7.0	19 351	58.5	56 564	5.9	84 244	6.3
Zambezi	144	0.1	2 037	4.7	330	1.0	86 503	9.0	89 013	6.7
Not Specified	1 750	0.6	0	0.0	0	0.0	0	0.0	1 750	0.1
TOTAL	288 171	100	43 567	100	33 073	100	964 005	100	1 328 816	100

TABLE 13 (A6): R&D EXPENDITURE BY RESEARCH FIELD (RF) 2021/22 (N$ '000)

Research Field	Business		Not-for-profit		Government		Higher Education		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Natural Sciences	10 059	3.5	19 612	59.3	29 980	68.8	263 520	27.3	323 171	24.3
Engineering & Technology	16 889	5.9	447	1.4	8 673	19.9	149 106	15.5	175 115	13.2
Medical & Health Sciences	6 839	2.4	0	0.0	3 949	9.1	156 609	16.2	167 396	12.6
Agricultural Sciences	248 679	86.3	6 017	18.2	150	0.3	136 056	14.1	390 903	29.4
Social sciences	0	0.0	2 035	6.2	0	0.0	258 713	26.8	260 748	19.6
Humanities	3 955	1.4	0	0.0	0	0.0	0	0.0	3 955	0.3
Not Specified	1 750	0.6	4 961	15.0	815	1.9	0	0.0	7 526	0.6
TOTAL	288 171	100.00	33 073	100.0	43 567	100.0	964 005	100.0	1 328 816	100.0

TABLE 14 (A7): R&D EXPENDITURE BY SOCIO-ECONOMIC OBJECTIVE (SEO) 2021/22 (N$ '000)

	Business		Government		Not-for-profit		HEI		TOTAL	
	N$	%	N$	%	N$	%	N$	%	N$	%
Agriculture	155 201	53.9	2 869	6.6	9 987	30.2	97 110	10.1	265 166	20.0
Culture, recreation, religion and mass media	505	0.2	0	0	0	0.0	14 665	1.5	15 170	1.1
Defence	0	0.0	0	0	0	0.0	0	0	0	0
Education	0	0.0	6 75	1.5	728	2.2	77 983	8.1	79 386	6.0
Energy	1 244	0.4	1 184	2.7	0	0.0	49 411	5.1	51 839	3.9
Environment	99 004	34.4	13 987	32.1	0	0.0	77 088	8.0	190 079	14.3
Exploration and Exploitation of Space	3 450	1.2	0	0	0	0.0	24 734	2.6	28 184	2.1
Exploration and Exploitation of the Earth	739	0.3	7 104	16.3	19 922	60.2	16 489	1.7	44 254	3.3
General advancement of knowledge	6 150	2.1	228	0.5	508	1.5	31 154	3.2	38 040	2.9
Health	7 530	2.6	7 360	16.9	710	2.1	117 721	12.2	133 322	10.0
Industrial Production and Technology	12 598	4.4	75	0.2	508	1.5	27 032	2.8	40 213	3.0
Political and social system, structures and processes	0	0.0	2 461	5.6	710	2.2	14 665	1.5	17 836	1.3
Transport, Telecommunication and other Infrastructures	0	0.0	4 364	10.0	0	0.0	14 665	1.5	19 029	1.4
Not Specified	1 750	0.6	3 260	7.5	0	0.0	401 289	41.6	406 299	30.6
TOTAL	288 171	100.0	43 567	100.0	33 073	100.0	964 005	100.0	1 328 816	100.0

TABLE 15 (A8): BUSINESS R&D EXPENDITURE BY ISIC INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION 2021/22

Standard Industrial Classification	N$ in '000	%
Crop and animal production, hunting and related service activities	99 414	34.5
Forestry and logging	96 596.5	33.5
Fishing and aquaculture	53 608.8	18.6
Mining of coal and lignite	505	0.2
Other mining and quarrying	8 440	2.9
Manufacture of food products	1 764	0.6
Manufacture of textiles	768.7	0.3
Manufacture of wearing apparel	768.7	0.3
Manufacture of leather and related products	9 119	3.2
Manufacture of chemicals and chemical products	2 110	0.7
Manufacture of basic pharmaceutical products and pharmaceutical preparations	3 018	1.0
Waste collection, treatment and disposal activities; materials recovery	894	0.3
Warehousing and support activities for transportation	505	0.2
Accommodation	505	0.2
Scientific research and development	3 671.76	1.3
Other professional, scientific and technical activities	728.36	0.3
Rental and leasing activities	578.92	0.2
Office administrative, office support and other Business support activities	110.88	0.0
Education	110.88	0.0
Human health activities	2 876.48	1.0
Residential care activities	73.92	0.0
Gambling and betting activities	252.5	0.1
Not specified	1 750.6	0.6
TOTAL	288 171	100

TABLE 16 (A9): BUSINESS HEADCOUNT OF R&D PERSONNEL BY QUALIFICATION, SEX AND NATIONALITY (2021/22)

HIGHEST QUALIFICATION	M	NAMIBIAN	F	NAMIBIAN	TOTAL
RESEARCHERS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	3	2	1	1	4
Master's or Equivalent Level (ISCED LEVEL 7)	17	12	8	6	25
Bachelor's or Equivalent Level (ISCED LEVEL 6)	8	8	17	17	25
Short-cycle Tertiary Education (ISCED LEVEL 5)	5	2	1	1	6
All Other Qualifications (ISCED LEVEL 4 and below)	0	0	0	0	0
TOTAL	33	24	27	25	60
TECHNICIANS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	0	0	0	0	0
Bachelor's or Equivalent Level (ISCED LEVEL 6)	6	6	6	6	12
Short-cycle Tertiary Education (ISCED LEVEL 5)	3	0	0	0	3
All Other Qualifications (ISCED LEVEL 4 and below)	2	2	2	1	4
TOTAL	11	8	8	7	19
OTHER SUPPORT STAFF					
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	4	1	1	0	5
Bachelor's or Equivalent Level (ISCED LEVEL 6)	4	4	2	2	6
Short-cycle Tertiary Education (ISCED LEVEL 5)	1	1	0	0	1
All Other Qualifications (ISCED LEVEL 4 and below)	11	8	2	0	13
TOTAL	20	14	5	2	25
GRAND TOTAL	64	46	40	34	104

TABLE 17 (A10): NOT-FOR-PROFIT HEADCOUNT OF R&D PERSONNEL BY QUALIFICATION, SEX AND NATIONALITY, 2021/22

HIGHEST QUALIFICATION	M	NAMIBIAN	F	NAMIBIAN	TOTAL
RESEARCHERS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	4	2	8	3	12
Master's or Equivalent Level (ISCED LEVEL 7)	9	6	10	6	19
Bachelor's or Equivalent Level (ISCED LEVEL 6)	5	5	5	3	10
Short-cycle Tertiary Education (ISCED LEVEL 5)	1	1	2	2	3
All Other Qualifications (ISCED LEVEL 4 and below)	3	3	0	0	3
TOTAL	22	17	25	14	47
TECHNICIANS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	1	0	1
Master's or Equivalent Level (ISCED LEVEL 7)	3	2	1	0	4
Bachelor's or Equivalent Level (ISCED LEVEL 6)	7	4	5	2	12
Short-cycle Tertiary Education (ISCED LEVEL 5)	1	1	1	1	2
All Other Qualifications (ISCED LEVEL 4 and below)	2	2	0	0	2
TOTAL	13	9	8	3	21
OTHER SUPPORT STAFF					
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	0	0	1	0	1
Bachelor's or Equivalent Level (ISCED LEVEL 6)	2	2	5	5	7
Short-cycle Tertiary Education (ISCED LEVEL 5)	0	0	4	4	4
All Other Qualifications (ISCED LEVEL 4 and below)	18	18	2	2	20
TOTAL	20	20	12	11	32
GRAND TOTAL	55	46	45	28	100

TABLE 18 (A11): HIGHER EDUCATION HEADCOUNT OF R&D PERSONNEL BY QUALIFICATION, SEX AND NATIONALITY, 2021/22

HIGHEST QUALIFICATION	M	NAMIBIAN	F	NAMIBIAN	TOTAL
RESEARCHERS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	334	154	201	161	535
Master's or Equivalent Level (ISCED LEVEL 7)	426	335	442	411	868
Bachelor's or Equivalent Level (ISCED LEVEL 6)	156	112	149	132	305
Short-cycle Tertiary Education (ISCED LEVEL 5)	6	4	17	17	23
All Other Qualifications (ISCED LEVEL 4 and below)	32	32	37	37	69
TOTAL	954	637	846	758	1800
TECHNICIANS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	18	18	16	16	34
Bachelor's or Equivalent Level (ISCED LEVEL 6)	61	59	68	68	129
Short-cycle Tertiary Education (ISCED LEVEL 5)	11	11	5	5	16
All Other Qualifications (ISCED LEVEL 4 and below)	2	2	11	11	13
TOTAL	92	90	100	100	192
OTHER SUPPORT STAFF					
Doctoral or Equivalent Level (ISCED LEVEL 8)	14	14	7	7	21
Master's or Equivalent Level (ISCED LEVEL 7)	32	28	62	60	94
Bachelor's or Equivalent Level (ISCED LEVEL 6)	61	60	140	136	201
Short-cycle Tertiary Education (ISCED LEVEL 5)	49	49	84	83	133
All Other Qualifications (ISCED LEVEL 4 and below)	55	54	80	80	135
TOTAL	211	205	373	366	584
GRAND TOTAL	1 257	932	1 319	1 224	2 576

TABLE 19 (A12): GOVERNMENT HEADCOUNT OF R&D PERSONNEL BY QUALIFICATION, SEX AND NATIONALITY, 2021/22

HIGHEST QUALIFICATION	M	NAMIBIAN	F	NAMIBIAN	TOTAL
RESEARCHERS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	5	5	6	6	11
Master's or Equivalent Level (ISCED LEVEL 7)	50	50	69	69	119
Bachelor's or Equivalent Level (ISCED LEVEL 6)	70	70	78	78	148
Short-cycle Tertiary Education (ISCED LEVEL 5)	27	27	83	83	110
All Other Qualifications (ISCED LEVEL 4 and below)	103	103	104	104	207
TOTAL	255	255	340	340	595
TECHNICIANS					
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	2	2	3	3	5
Bachelor's or Equivalent Level (ISCED LEVEL 6)	5	5	14	14	19
Short-cycle Tertiary Education (ISCED LEVEL 5)	5	5	3	3	8
All Other Qualifications (ISCED LEVEL 4 and below)	5	5	6	6	11
TOTAL	17	17	26	26	43
OTHER SUPPORT STAFF					
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	0	0	3	3	3
Bachelor's or Equivalent Level (ISCED LEVEL 6)	2	2	4	3	6
Short-cycle Tertiary Education (ISCED LEVEL 5)	1	0	3	3	4
All Other Qualifications (ISCED LEVEL 4 and below)	4	4	4	4	8
TOTAL	7	6	14	13	21
GRAND TOTAL	279	278	380	379	659

TABLE 20 (A13): HIGHER EDUCATION HEADCOUNT OF R&D PERSONNEL BY AGE AND SEX, 2021/22

AGE	Male	Female	TOTAL
Researchers			
Under 25	20	19	39
25-34	120	185	305
35-44	374	309	683
45-54	254	190	444
55-59	98	70	168
60-64	66	53	119
65 and above	22	20	42
TOTAL	954	846	1800
Technicians			
Under 25	1	4	5
25-34	35	53	88
35-44	34	35	69
45-54	13	8	21
55-59	6	0	6
60-64	3	0	3
65 and above	0	0	0
TOTAL	92	100	192
Other Support staff			
Under 25	0	3	3
25-34	47	78	125
35-44	82	155	237
45-54	56	104	160
55-59	20	25	45
60-64	5	8	13
65 and above	1	0	1
TOTAL	211	373	584
GRAND TOTAL	1257	1319	2576

TABLE 21 (A14): GOVERNMENT HEADCOUNT OF R&D PERSONNEL BY AGE AND SEX, 2021/22

Researchers	Male	Female	Total
Under 25	0	0	0
25-34	17	19	36
35-44	25	25	50
45-54	6	6	12
55-59	1	1	2
60-64	0	0	0
Not specified	206	289	495
TOTAL	255	340	595
Technicians			
Under 25	0	0	0
25-34	3	14	17
35-44	6	5	11
45-54	3	3	6
55-59	0	0	0
60-64	0	0	0
Not specified	5	4	9
TOTAL	17	26	43
Other Support staff			
Under 25	0	2	2
25-34	0	5	5
35-44	3	3	6
45-54	3	2	5
55-59	1	2	3
60-64	0	0	0
TOTAL	7	14	21
GRAND TOTAL	279	380	659

TABLE 22 (A15): BUSINESS HEADCOUNT OF R&D PERSONNEL BY AGE AND SEX, 2021/22

AGE	Male	Female	Total
RESEARCHERS			
Under 25	0	3	3
25-34	15	16	31
35-44	9	4	13
45-54	7	3	10
55-59	1	1	2
60-64	1	0	1
TOTAL	33	27	60
TECHNICIANS			
Under 25	0	0	0
25-34	5	6	11
35-44	5	2	7
45-54	1	0	1
55-59	0	0	0
60-64	0	0	0
TOTAL	11	8	19
OTHER SUPPORT STAFF			
Under 25	0	0	0
25-34	9	5	14
35-44	6	0	6
45-54	5	0	5
55-59	0	0	0
60-64	0	0	0
TOTAL	20	5	25
GRAND TOTAL	64	40	104

TABLE 23 (A16): NOT-FOR-PROFIT HEADCOUNT OF R&D PERSONNEL BY AGE AND SEX, 2021/22

CATEGORY R&D PERSONNEL	Male	Female	TOTAL
Researchers			
Under 25	1	2	3
25-34	10	14	24
35-44	3	2	5
45-54	5	5	10
55-59	0	1	1
60 and above	3	1	4
TOTAL	22	25	47
Technicians			
Under 25	4	4	8
25-34	6	4	10
35-44	2	0	2
45-54	1	0	1
55-59	0	0	0
60 and above	0	0	0
TOTAL	13	8	21
Other Support staff			
Under 25	1	2	3
25-34	5	5	10
35-44	7	4	11
45-54	7	1	8
55-59	0	0	0
60 and above	0	0	0
TOTAL	20	12	32
GRAND TOTAL	55	45	100

TABLE 24 (A17): BUSSINESS HEADCOUNT OF R&D PERSONNEL BY RESEARCH FIELD AND SEX, 2021/22

FIELD OF SCIENCE	Male	Female	TOTAL
Researchers			
Natural sciences	5	2	7
Engineering and technology	12	7	19
Medical and health sciences	5	4	9
Agricultural sciences	3	4	7
Social sciences	4	6	10
Humanities	0	0	0
Not specified elsewhere (crosscutting or multidisciplinary)	4	4	8
TOTAL	33	27	60
Technicians			
Natural sciences	4	3	7
Engineering and technology	5	4	9
Medical and health sciences	0	0	0
Agricultural sciences	1	0	1
Social sciences	0	0	0
Humanities	1	0	1
Not specified elsewhere (crosscutting or multidisciplinary)	0	1	1
TOTAL	11	8	19
Other Support staff			
Natural sciences	6	0	6
Engineering and technology	8	3	11
Medical and health sciences	0	0	0
Agricultural sciences	5	1	6
Social sciences	0	0	0
Humanities	1	0	1
Not specified elsewhere (crosscutting or multidisciplinary)	0	1	1
TOTAL	20	5	25
GRANT TOTAL	64	40	104

TABLE 25 (A18): GOVERNMENT HEADCOUNT OF R&D PERSONNEL BY RESEARCH FIELD AND SEX, 2021/22

FIELD OF SCIENCE	Male	Female	TOTAL
RESEARCHERS			
Natural sciences	41	34	75
Engineering and technology	0	3	3
Medical and health sciences	1	5	6
Agricultural sciences	0	0	0
Social sciences	3	7	10
Humanities	2	1	3
Not specified elsewhere (crosscutting or multidisciplinary)	2	1	3
Not classified	206	289	495
TOTAL	255	340	595
TECHNICIANS			
Natural sciences	10	17	27
Engineering and technology	0	0	0
Medical and health sciences	2	1	3
Agricultural sciences	0	0	0
Social sciences	0	4	4
Humanities	0	0	0
Not specified elsewhere (crosscutting or multidisciplinary)	0	0	0
Not classified	5	4	9
TOTAL	17	26	43
OTHER SUPPORT STAFF			
Natural sciences	3	8	11
Engineering and technology	0	1	1
Medical and health sciences	0	1	1
Agricultural sciences	0	0	0
Social sciences	1	4	5
Humanities	0	0	0
Not specified elsewhere (crosscutting or multidisciplinary)	3	0	3
TOTAL	7	14	21
GRAND TOTAL	279	380	659

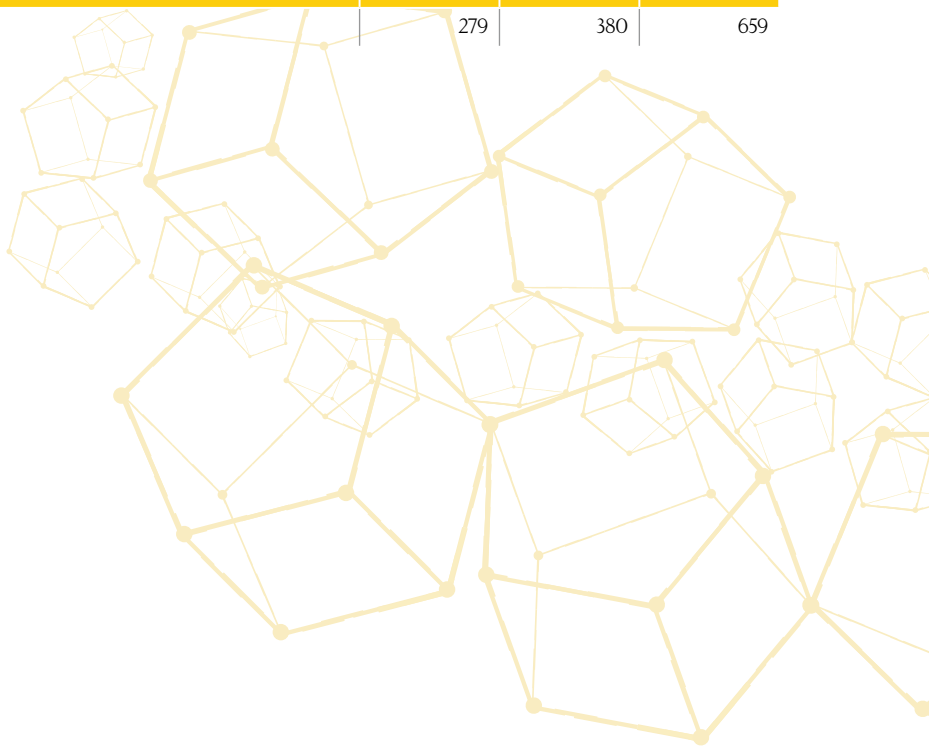


TABLE 26 (A19): HIGHER EDUCATION HEADCOUNT OF R&D PERSONNEL BY RESEARCH FIELD AND SEX, 2021/22

FIELD OF SCIENCE	Male	Female	TOTAL
RESEARCHERS			
Natural sciences	149	120	269
Engineering and technology	119	46	165
Medical and health sciences	129	170	299
Agricultural sciences	100	65	165
Social sciences	343	313	656
Humanities	29	29	58
Not specified elsewhere (crosscutting or multidisciplinary)	32	58	90
Not classified	53	45	98
TOTAL	954	846	1 800
TECHNICIANS			
Natural sciences	34	30	64
Engineering and technology	18	5	23
Medical and health sciences	21	28	49
Agricultural sciences	5	10	15
Social sciences	14	26	40
Humanities	0	0	0
Not specified elsewhere (crosscutting or multidisciplinary)	0	1	1
TOTAL	92	100	192
OTHER SUPPORT STAFF			
Natural sciences	3	14	17
Engineering and technology	3	12	15
Medical and health sciences	5	17	22
Agricultural sciences	13	11	24
Social sciences	23	56	79
Humanities	1	2	3
Not specified elsewhere (crosscutting or multidisciplinary)	163	261	424
TOTAL	211	373	584
GRAND TOTAL	1 257	1 319	2 576

TABLE 27 (A20): NOT-FOR-PROFIT HEADCOUNT OF R&D PERSONNEL BY RESEARCH FIELD AND SEX, 2021/22

FIELD OF SCIENCE	Male	Female	TOTAL
Researchers			
Natural sciences	13	15	28
Engineering and technology	0	0	0
Medical and health sciences	0	1	1
Agricultural sciences	3	3	6
Social sciences	1	3	4
Humanities	0	0	0
Not specified elsewhere (crosscutting or multidisciplinary)	5	3	8
TOTAL	22	25	47
Technicians			
Natural sciences	7	3	10
Engineering and technology	0	0	0
Medical and health sciences	0	0	0
Agricultural sciences	5	5	10
Social sciences	0	0	0
Humanities	0	0	0
Not specified elsewhere (crosscutting or multidisciplinary)	1	0	1
TOTAL	13	8	21
Other Support staff			
Natural sciences	1	4	5
Engineering and technology	0	0	0
Medical and health sciences	0	0	0
Agricultural sciences	0	0	0
Social sciences	0	1	1
Humanities	0	2	2
Not specified elsewhere (crosscutting or multidisciplinary)	19	5	24
TOTAL	20	12	32
GRAND TOTAL	55	45	100

TABLE 28 (A21): BUSINESS FTES OF R&D PERSONNEL BY QUALIFICATION AND SEX, 2021/22

HIGHEST QUALIFICATION	Male	Female	TOTAL
RESEARCHERS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	1.4	1.0	2.4
Master's or Equivalent Level (ISCED LEVEL 7)	10.9	8.0	18.9
Bachelor's or Equivalent Level (ISCED LEVEL 6)	5.1	12.7	17.8
Short-cycle Tertiary Education (ISCED LEVEL 5)	3.8	1.0	4.8
All Other Qualifications (ISCED LEVEL 4 and below)	0	0	0
TOTAL	21.2	22.7	43.9
TECHNICIANS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	0	0	0
Bachelor's or Equivalent Level (ISCED LEVEL 6)	2.4	2.4	4.8
Short-cycle Tertiary Education (ISCED LEVEL 5)	1.8	0	1.8
All Other Qualifications (ISCED LEVEL 4 and below)	0.2	1.1	1.3
TOTAL	4.4	3.5	7.9
OTHER SUPPORT STAFF			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	3.3	1.0	4.3
Bachelor's or Equivalent Level (ISCED LEVEL 6)	3.3	2.0	5.3
Short-cycle Tertiary Education (ISCED LEVEL 5)	0.3	0	0.3
All Other Qualifications (ISCED LEVEL 4 and below)	4.3	0.2	4.5
TOTAL	11.2	3.2	14.4
GRAND TOTAL	36.8	29.4	66.2

TABLE 29 (A22): HIGHER EDUCATION FTES OF R&D PERSONNEL BY QUALIFICATION AND SEX, 2021/22

HIGHEST QUALIFICATION	Male	Female	TOTAL
RESEARCHERS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	97.3	55.5	152.8
Master's or Equivalent Level (ISCED LEVEL 7)	113.8	115.1	228.9
Bachelor's or Equivalent Level (ISCED LEVEL 6)	49.6	44.4	94
Short-cycle Tertiary Education (ISCED LEVEL 5)	2.4	5.1	7.5
All Other Qualifications (ISCED LEVEL 4 and below)	9.6	11.4	21
TOTAL	272.7	231.5	504.2
TECHNICIANS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	5	4.8	9.8
Bachelor's or Equivalent Level (ISCED LEVEL 6)	17.9	19.8	37.7
Short-cycle Tertiary Education (ISCED LEVEL 5)	3.3	1.5	4.8
All Other Qualifications (ISCED LEVEL 4 and below)	0.6	3.3	3.9
TOTAL	26.8	29.4	56.2
OTHER SUPPORT STAFF			
Doctoral or Equivalent Level (ISCED LEVEL 8)	2.8	1.4	4.2
Master's or Equivalent Level (ISCED LEVEL 7)	6.4	12.4	18.8
Bachelor's or Equivalent Level (ISCED LEVEL 6)	12.2	28.0	40.2
Short-cycle Tertiary Education (ISCED LEVEL 5)	9.8	16.8	26.6
All Other Qualifications (ISCED LEVEL 4 and below)	11.0	16.0	27.0
TOTAL	42.2	74.6	116.8
GRAND TOTAL	341.7	335.5	677.2

Table 30 (A23): GOVERNMENT FTES OF R&D PERSONNEL BY QUALIFICATION AND SEX 2021/22

HIGHEST QUALIFICATION	Male	Female	TOTAL
RESEARCHERS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0.9	2.0	2.9
Master's or Equivalent Level (ISCED LEVEL 7)	10.4	18.2	28.6
Bachelor's or Equivalent Level (ISCED LEVEL 6)	10.3	8.7	19.0
Short-cycle Tertiary Education (ISCED LEVEL 5)	0	0	0
All Other Qualifications (ISCED LEVEL 4 and below)	0.4	0	0.4
TOTAL	22.0	28.9	50.9
TECHNICIANS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	0.1	1.9	2.0
Bachelor's or Equivalent Level (ISCED LEVEL 6)	1.7	3.8	5.5
Short-cycle Tertiary Education (ISCED LEVEL 5)	0.4	1.9	2.3
All Other Qualifications (ISCED LEVEL 4 and below)	2.0	3.8	5.8
TOTAL	4.2	11.4	15.6
OTHER SUPPORT STAFF			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	0	2.2	2.2
Bachelor's or Equivalent Level (ISCED LEVEL 6)	1.2	1.4	2.6
Short-cycle Tertiary Education (ISCED LEVEL 5)	0.3	0.9	1.2
All Other Qualifications (ISCED LEVEL 4 and below)	2.4	3.3	5.7
TOTAL	3.9	7.8	11.7
GRAND TOTAL	30.1	48.1	78.2

TABLE 31 (A24): NOT-FOR-PROFIT FTES OF R&D PERSONNEL BY QUALIFICATION AND SEX 2021/22

HIGHEST QUALIFICATION	Male	Female	TOTAL
RESEARCHERS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	4.0	7.3	11.3
Master's or Equivalent Level (ISCED LEVEL 7)	7.6	8.9	16.5
Bachelor's or Equivalent Level (ISCED LEVEL 6)	5.0	3.7	8.7
Short-cycle Tertiary Education (ISCED LEVEL 5)	1.0	1.5	2.5
All Other Qualifications (ISCED LEVEL 4 and below)	3.0	0	3.0
TOTAL	20.6	21.4	42.0
TECHNICIANS			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0.5	0.5
Master's or Equivalent Level (ISCED LEVEL 7)	2.0	0.5	2.5
Bachelor's or Equivalent Level (ISCED LEVEL 6)	3.5	2.5	6.0
Short-cycle Tertiary Education (ISCED LEVEL 5)	0.5	0.5	1.0
All Other Qualifications (ISCED LEVEL 4 and below)	1.3	0	1.3
TOTAL	7.3	4.0	11.3
OTHER SUPPORT STAFF			
Doctoral or Equivalent Level (ISCED LEVEL 8)	0	0	0
Master's or Equivalent Level (ISCED LEVEL 7)	0	1.0	1.0
Bachelor's or Equivalent Level (ISCED LEVEL 6)	1.0	4.0	5.0
Short-cycle Tertiary Education (ISCED LEVEL 5)	0	3.0	3.0
All Other Qualifications (ISCED LEVEL 4 and below)	3.1	0.2	3.3
TOTAL	4.1	8.2	12.3
TOTAL	32.0	33.6	65.6

R&D122-001
Enumerator Unique Number:

STRICTLY CONFIDENTIAL
THANK YOU FOR YOUR TIME AND EFFORT

BUSINESS R&D SURVEY

QUESTIONAIRRE 1

NATIONAL SURVEY OF RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D) INPUTS
BUSINESS ENTERPRISE - FINANCIAL YEAR 2021/2022 (or 2020/2021)

Organization	Please modify address label (only if there is one)

AUTHORITY

The National Commission on Research Science and Technology (NCRST) established in accordance with Section 4 of the Research, Science and Technology Act, 2004 (Act 23 of 2004 is mandated to conduct a survey of inputs into Research and experimental Development (R&D)

All data gathered for this survey are confidential. Only the survey team sees individual organization data. Raw data gathered for this survey is confidential except when an organization gives written permission for its data to be disclosed to other parties.

PURPOSE AND SCOPE OF SURVEY

The R&D survey collects data on the inputs into R&D activities performed IN-HOUSE by all organizations (including higher education, government, business and not-for profit). The data are used for planning and monitoring purposes and for measuring international competitiveness.

This survey covers the Financial Year: 01/04/2021 to 31/03/2022 (or your nearest complete financial or academic year).

DUE DATE

Kindly review the questionnaire and compile the information required. An interviewer will contact you within one week to arrange for a meeting to collect the information.

ASSISTANCE

To assist you with queries kindly contact one of the survey managers:

Name	Contact Number	Email
Gernot Piepmeyer	061 4317069	gpiepmeyer@ncrst.na
Prof Paulina Kadhila	0812400892	npkadhila@unam.na

PERSON COMPLETING THE QUESTIONNAIRE:

Organization		Tel	(+264)
CEO/ Manager		Business Address	
Name of person completing (with title)		Business Physical address	
Designation		Cell	(+264)
Date		Email	
Signature		Website	

THE FOLLOWING DEFINITIONS ARE IMPORTANT IN THE COMPLETION OF THE SURVEY QUESTIONNAIRE:

Definition of R&D:

This survey follows the Frascati Manual guidelines for conducting survey on the inputs to R&D (OECD, 2002).
It defines research and experimental development (R&D) as:

- **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 their scientific knowledge for the creation of new or significantly improved products, applications or processes.

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.

Scope of survey:

- The survey requests data **on R&D performed IN-HOUSE by your organization** in the national territory.
- Part five includes some questions on extramural R&D.

R&D in business:

Any activity classified as R&D is characterised by originality; it should have investigation as a primary objective and should have the potential to produce results that are sufficiently general for humanity's stock of knowledge (theoretical and/or practical) to be recognisably increased.

R&D includes – but is not limited to:

Activities of personnel who are obviously engaged in R&D.
In addition, research activity includes:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D.
- The management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support or assistance to those R&D activities of students undertaking postgraduate research courses.
- Software development where the aim of the project is the systematic resolution of a scientific uncertainty.
- Research work in the natural sciences, engineering, medical sciences, agricultural sciences, social sciences and the humanities.
- R&D carried out as a participant in any unincorporated joint venture.
- Prototypes and pilot plants, as long as long as the primary objective is to make further improvements.
- Industrial design and drawing but only if required for R&D.
- R&D projects performed on contract for other legal entities, such as businesses.
- "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 specific activities are excluded except where they are used primarily for the support of or as part of R&D activities performed in this reporting unit:

- 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.
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 service 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.

Borderline cases:

- The greatest source of error in measuring R&D is the difficulty of locating the cut-off point between experimental development and the related activities required to realise an innovation.
- Care must be taken to exclude activities that although undoubtedly a part of the innovation process, rarely involve any R&D, e.g. patent filing and licensing, market research, manufacturing start-up, tooling up and redesign for the manufacturing process.
- It is also difficult to define precisely the cut-off point between experimental development and pre-production development, such as producing user demonstration models and testing, and production that is applicable to all industrial situations. If the primary objective is to make further technical improvements on the product or process, then the work falls within the definition of R&D. If, on the other hand, the product, process or approach is substantially set and the primary objective is to develop markets, to do pre-production planning or to get a production or control system working smoothly, the work is no longer R&D.

PART 1: GENERAL INFORMATION

1a. Registered name of company	
1b. Trading as (if applicable)	

2a. If you are reporting R&D for subsidiary companies (e.g. as a head office with several subsidiary companies), please list the companies below (append a page if required).

2b. List the principal activities from which your company derives its main income.

Activities	Company income obtained (%)

3. Parent Company (if applicable) with % ownership

Parent company	% ownership
	%

4. Approximate foreign/local ownership split (By ultimate ownership if complex holding structures exist.)

RSA	
EU	%
USA	%
China	%
Other	%
Domestic	%
TOTAL	100%

5. Financial year (dd/mm/yyyy) for which you are reporting in this survey

From	**to**

6. Total number of employees	
7. Gross sales revenue or turnover (local currency '000 excl. VAT)	

8. Did the reporting unit perform any IN-HOUSE R&D during the financial year?

Yes	☐	**Continue with Question 9.**
No	☐	**Proceed to Part 5 if you paid for R&D to other parties (optional).**
	☐	**If the organization/unit does not do any In-House and/or any extramural R&D, tick this box and return the questionnaire as a NIL response.**

PART 2: IN-HOUSE R&D PERSONNEL

R&D PERSONNEL

- **Report against the categories listed below for all personnel employed directly in R&D or providing direct R&D services/support for at least 5% of their time. Do not count any staff NOT supporting research.**
- **Please report the average number of persons engaged in R&D during the reference year.**
- **Please include permanent, temporary, full-time, part-time and contract staff.**

Researchers

- Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the planning and management of the projects concerned.
- Researchers include managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work. Their rank is usually equal or superior to that of persons directly employed as researchers and they are often former or part-time researchers.
- Excluded are managers and directors concerned primarily with budgets and human resources rather than project management or content (include in other personnel directly supporting R&D).

Technicians directly supporting R&D

- Persons performing technical tasks in support of R&D, normally under the direction and supervision of a researcher.

Other personnel directly supporting R&D

- Other supporting staff includes skilled and unskilled crafts persons, secretarial and clerical staff participating in R&D projects or directly associated with such projects.
- Included are executives and directors concerned primarily with budgets and human resources in support of research rather than project management.
- Allowance for these should be made under "overheads in R&D expenditure" ("other current expenditure" in Question IIB) but such persons should not be included as R&D personnel.

Notes:

- Do not include personnel indirectly supporting R&D. Typical examples are transportation, storage, cleaning, repair, maintenance and security activities, as well as administration and clerical activities undertaken not exclusively for R&D (such as the activities of central finance and personnel departments).
- Allowance for these should be made under "overheads in R&D expenditure" ("other current expenditure" in Question IIB) but such persons should not be included as R&D personnel.

9. HEADCOUNT OF R&D PERSONNEL

CALCULATING HEADCOUNT (HC) DATA

HC data cover the total number of persons who are mainly or partially employed in R&D. This includes staff employed both full-time and part-time on R&D activities.

9.1(a) Headcount of all R&D personnel according to three categories, Namibian and non-Namibian and highest qualification

(1) RESEARCHERS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL RESEARCHERS (1)					

* Indicate please how many of the males are Namibian
** Indicated please how many of the females are Namibian

(2) TECHNICIANS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL TECHNICIANS (2)					

(3) OTHER SUPPORT STAFF

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL OTHER SUPPORT STAFF (3)					

	M	Namibian*	F	Namibian**	TOTAL
TOTAL R&D PERSONNEL (1+2+3)					

9.2 (a) Headcount of all R&D personnel according to three categories, Namibian and non-Namibian and fields of science

(1) RESEARCHERS

Field of science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Field of science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL TECHNICIANS					

(3) OTHER SUPPORT STAFF

Field of science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL OTHER SUPPORT STAFF					

9.3 (a) Headcount of all R&D personnel according to three categories, Namibian and non-Namibian and age

(1) RESEARCHERS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55- 59 years					
60 years and more					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55- 59 years					
60 years and more					
TOTAL TECHNICIANS					

(3) OTHER SUPPORT STAFF

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60 years and more					
TOTAL OTHER SUPPORT STAFF					

10. RESEARCH FULL-TIME EQUIVALENTS (FTEs) AND COST TO BUSINESS ENTERPRISES

Provide an estimate of person-years of effort on R&D (or full-time equivalents), according to the categories below.

Using the male and female headcounts of all R&D personnel reported for in Question 4, provide the research full-time equivalents (time devoted to R&D). Then, calculate the total labour costs of R&D using the average annual full cost-to-company for full-time staff (including annual wages and salaries and all associated costs or fringe benefits, such as bonus payments, contributions to pension and medical aid funds, payroll tax, unemployment insurance fund and all other statutory payments) per category below.

CALCULATING FULL-TIME EQUIVALENT (FTE) PERSONS

FTE data measure the volume of human resources in R&D. One FTE may be thought of as one person-year. That is 1 FTE is equal to 1 person working full-time on R&D for a period of 1 year or more persons working part-time or for a shorter period corresponding to one person-year.

For the purpose of this survey, an employee can work a maximum of 1 FTE in a year.

The following is a theoretical approach to calculating FTE:

FTE: (Dedication to the employment: Full-time/Part-time) x (Portion of the year active on R&D) x (Time or portion spent on R&D)

Examples are the following:

- A full-time employee spending 100% of time on R&D during a year: (1 x 1 x 1) = 1 FTE
- A full-time employee spending 30% of time on R&D during a year: (1 x 1 x 0.3) = 0.3 FTE
- A full-time R&D worker who is spending 100% of time on R&D, is employed at an R&D institution for only six months: (1 x 0.5 x 1) = 0.5 FTE
- A full-time employee spending 40% of time on R&D during half of the year (person is only active for 6 months per year): (1 x 0.5 x 0.4) = 0.2 FTE
- A part-time employee (working 40% of a full-time year) engaged only in R&D (spending 100% of time on R&D) during a year: (0.4 x 1 x 1) = 0.4 FTE
- A part-time employee (working 40% of a full-time year) spending 60% of time on R&D during half of the year (person is only active for 6 months per year): (0.4 x 0.5 x 0.6) = 0.12 FTE
- 20 full time employees spending 40% of time on R&D during a year: 20 x (1 x 1 x 0.4) = 8 FTE

NOTE: Please calculate FTEs for all R&D personnel.

10.1 FTE by personnel category

Personnel category	Headcounts (From Q 9.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
1) RESEARCHERS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL RESEARCHERS (1)						
(2) TECHNICIANS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL TECHNICIANS (2)						

(3) OTHER SUPPORT STAFF

Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL OTHER SUPPORT STAFF (3)						

Personnel category	Headcounts (From Q 9.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
TOTAL R&D PERSONNEL (1+2+3)						

10.2 FTE by field of science

Field of Science in R&D activity	Headcounts (From Q 9.2)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot

(1) RESEARCHERS

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL RESEARCHERS (same as 10.1)						

2) TECHNICIANS

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL TECHNICIANS (same as 10.1)						

3) OTHER SUPPORT STAFF

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL OTHER SUPPORT STAFF (same as 10.1)						

10.3 FTE by personnel category and labour cost

Personnel categories	Full Time Equivalent (FTE) (From Q 10.1) (A)	Average annual labour cost per person Local Currency '000 (Excl. VAT) (B)	Calculated labour cost of R&D Local Curr. '000 (Excl. VAT) (A x B)
Total researchers (1)			
Total technicians (2)			
Total other support staff (3)			
TOTAL LABOUR COST (1+2+3)			

Carry subtotal over to Q 11A

PART 3: IN-HOUSE R&D EXPENDITURE

THE DEFINITION AND CALCULATION OF IN-HOUSE R&D EXPENDITURE

OTHER CURRENT EXPENDITURE

Including – but not limited to:

- Direct project costs, project consumables and running costs linked to research, such as materials, fuels and other inputs, including telephone and printing.
- Subsistence and travel expenses.
- Repair and maintenance expenses.
- Payments to outside organizations for use of specialised testing facilities, analytical work, engineering or other specialised services in support of R&D projects carried out by this reporting unit.
- Commission/consultant expenses for research projects carried out by this reporting unit.
- The relevant % of indirect and institutional costs and utility costs, such as rent, space charge, leasing and hiring expenses, furniture, water, electricity and any other overhead costs.The relevant % of labour costs of persons providing indirect services such as the head office, human resources, finances, security and maintenance personnel as well as staff of central libraries and IT departments.

Excluding:

- Contract R&D expenses where the research project is carried out elsewhere by others on behalf of this reporting unit.
- Payments for purchases of technical know-how (goodwill).
- Licence fees.
- Depreciation provisions.

- Where current expenses such as direct project costs and consumables are used solely for R&D, allocate the full cost of the items.
- If these current expenses are used for more than one activity, include only an estimate of the portion used for R&D.
- Only where such an estimate of the portion used for R&D is not available, such as indirect and utility costs and labour costs of staff providing indirect services, it is advised that respondents apply the percentage time that researchers in the reporting unit spent on R&D to the total of these current expenditures.
- So if the income and expenditure statement shows that the current expenditure for indirect and utility costs and labour costs of staff providing indirect services for the year was say USD 1.700,000 and that researchers on average spent 80% of their time to R&D, then this component of R&D current expenditure may be estimated as 0.8 x USD 1.700,000 = USD 1.360,000.

CAPITAL EXPENDITURE

The full cost of capital expenses must be reported in the year of purchase (do not depreciate).	
Including – but not limited to: • Expenditure on fixed assets used in the R&D projects of this reporting unit. • Acquisition of software, including license fees, expected to be used for more than one year. • Purchase of databases expected to be used for more than one year. • Major repairs, improvements and modifications on land and buildings. • Where a capital item is used solely for R&D, allocate the full cost of the item.	**Excluding:** • Other repairs and maintenance expenses. • Depreciation provisions. • Proceeds from the sale of R&D assets.
• If the capital item is used for more than one activity, include only an estimate of the portion used for R&D. For example, a new piece of equipment that will be used for R&D (included), testing (excluded) and quality control (excluded). For instance, if the intended use of this new equipment for R&D purposes is 40% of the total usage (i.e. the other 60% for other activities), only 40% of the total equipment cost should be considered as relevant R&D expenditure. • Only where such an estimate of the portion used for R&D is not available, apply the percentage time that researchers in the reporting unit spent on R&D to the cost of the item.	

11. IN-HOUSE R&D EXPENDITURE

Compile expenditure on IN-HOUSE R&D during the fiscal year ...<YYYY>... Include expenditure funded from all sources: internal and external (contracts and grants) and undertaken by the reporting unit on its own behalf or for other parties.
PLEASE NOTE: Extramural R&D should be reported under Part 5.

Purchase of equipment can, in theory, be classified as either capital or current expenditure. A distinction can therefore be made between "major" and "minor" equipment (to be included in "capital" and "current" expenditures respectively) by establishing some kind of monetary limitation. Please provide us with this limitation as used by your institution.

Local currency:	

LABOUR COSTS OF R&D

		Local currency '000 excluding VAT
Total cost of R&D personnel (carried over from Question 10.3)	A	

OTHER CURRENT EXPENDITURE ON R&D
(See the definition of current expenditure and how to calculate current expenditure devoted to R&D on the previous page)

		Local currency '000 excluding VAT
Other current expenditure	B	

CAPITAL EXPENDITURE ON R&D
(See the definition of capital expenditure and how to calculate capital expenditure on R&D on the previous page)

		Local currency '000 excluding VAT
Vehicles, plant, machinery and equipment	C	
Land, buildings and other structures	D	
Software	E	

		Local currency '000 excluding VAT
TOTAL R&D EXPENDITURE (A + B + C + D + E)	F	

Carry total R&D expenditure (F) over to Question 12

12. SOURCES OF FUNDS FOR IN-HOUSE R&D

Provide a breakdown of the total R&D expenditure according to the sources of funds listed below (NOTE: Only the proportion of the money actually SPENT is required not the total income per source)

Company	Local currency '000 excluding VAT
Own funds	

Government (includes departments/ministries and grant-making Institutes)

Grants, especially general purpose, including studentships	
Contracts to perform directed R&D	
Government supported loans for R&D	
Total	

Other local businesses

Contracts to perform R&D	

Other national sources

Not-for-profit organizations (including foundations)	
Individual donations	
Higher education	
Total	

Foreign sources

Parent company	
Philanthropic organizations and foundations	
All other foreign sources	
Total	

Of above total foreign sources, indicate the % from:

RSA	Rest of Africa	EU	Rest of Europe	China	Rest of Asia	USA/ Canada	Other	Total %

	Local currency '000 excluding VAT
TOTAL R&D EXPENDITURE (to equal Question IIF)	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE

13. 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 (optional) b) total IN-HOUSE R&D CURRENT expenditure (labour costs and other current cost) by type of R&D.

Column b
Basic research — optional

	a). Based on total intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		
• 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.						

Applied research

	a). Based on total intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		
• 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.						

Experimental development

	a). Based on total intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		
• Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed.						
TOTAL	1	0	0	1	0	0

14. DETAILED INDUSTRIAL BREAKDOWN

Classify the actual industrial orientation of the R&D carried out by the business, according to the National Industrial Classification or ISIC with associated percentage expenditure (see Appendix C)

- ISICs indicate the classification that best describes company R&D according to the intended **use** of the product.

ISIC codes		Percentage		ISIC codes		Percentage	
ISIC				ISIC			
ISIC				ISIC			
ISIC				ISIC			
ISIC				ISIC			
ISIC				ISIC			
ISIC				ISIC			
				Total	1	0	0

15. DETAILED FIELDS OF SCIENCE (FOS)

Classify R&D according to two-digit field of science (FoS) with associated percentage expenditure (see Appendix A)

- The FoS Codes are based on recognised academic disciplines and emerging areas of study.

FoS codes			Percentage		FoS codes			Percentage	
FoS					FoS				
FoS					FoS				
FoS					FoS				
FoS					FoS				
FoS					FoS				
FoS					FoS				
					Total		1	0	0

16. SOCIO-ECONOMIC OBJECTIVES (SEO)

Classify R&D according to socio-economic objective with associated percentage expenditure (see Appendix B)

- The SEO classification provides an indication of the main beneficiary of your R&D activities.

SEO codes			Percentage		SEO codes			Percentage	
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
					Total		1	0	0

17. Kindly indicate geographic the location where the reporting unit carried out R&D activities and the percentage of the total R&D expenditure

Specify where R&D activities actually take place, rather than where they are managed /financed from.

Region	Percentage (%)	Ohangwena	
Erongo		Omaheke	
Hardap		Omusati	
Karas		Oshana	
Kavango East		Oshikoto	
Kavango West		Otjozondjupa	
Khomas		Zambezi	
Kunene		TOTAL	100%

18. COLLABORATIVE R&D

18a. Does your company collaborate on R&D with persons/organisations outside your own organisation?
Tick as appropriate

No	Go to Part 5
Yes	Continue with Question 18b

18b. With whom is R&D conducted in partnerships, alliances or collaboration?
Tick as appropriate

Instruction

Note: In the table below a single collaborative R&D project with several partners may be ticked in several places. Collaborative R&D may be intramural or extramural. R&D collaboration can occur without expenditure – please note zero expenditure in such cases.

	Namibia	RSA	Rest of Africa	EU	Rest of Europe	China	Rest of Asia	USA/ Canada	Other
Higher Education Institutions									
Science Councils									
Government Research Institutes									
Members of own organisation/ Affiliate organisations									
Households									
Informal Businesses									
Indigenous Knowledge									
Other Companies (including specialist consultants, business and trade associations)									
Not-for-Profit Organisations									

PART 5: EXTRAMURAL R&D

Extramural R&D refers to:

- Extramural expenditures are the sums a reporting unit 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 (FM § 408).

	Approximate value Local currency '000 (excl. VAT)
19. State details of extramural R&D paid locally	
20. State details of extramural R&D paid abroad	

21. If the amounts stated in Question 19 or 20 are in excess of 1 million units of national currency please indicate the name of the organization(s) that conducted the extramural R&D with the associated expenditure.

STATE DETAILS OF EXTRAMURAL R&D PAID **LOCALLY**.

Paid to:	Approximate value Local currency '000s (excl. VAT)

STATE DETAILS OF EXTRAMURAL R&D PAID ABROAD.

Paid to:	Approximate value Local currency '000s (excl. VAT)

R&D222 – 001
Eumerator Unique Number

STRICTLY CONFIDENTIAL
THANK YOU FOR YOUR TIME AND EFFORT

GOVERNMENT R&D SURVEY

QUESTIONAIRRE 2

NATIONAL SURVEY OF RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D) INPUTS

GOVERNMENT SECTOR: PUBLIC RESEARCH INSTITUTES, OTHER GOVERNMENT DEPARTMENTS/UNITS ENGAGED IN R&D AND GOVERNMENT S&T SERVICE INSTITUTIONS

FINANCIAL YEAR 2021/2022 (or 2020/2021)

Organization	Please modify address label (only if there is one)

AUTHORITY

The National Commission on Research Science and Technology (NCRST) established in accordance with Section 4 of the Research, Science and Technology Act, 2004 (Act 23 of 2004 is mandated to conduct a SURVEY of inputs into Research and experimental Development (R&D)

All data gathered for this survey are confidential. Only the survey team sees individual organization data. Raw data gathered for this survey is confidential except when an organization gives written permission for its data to be disclosed to other parties.

PURPOSE AND SCOPE OF SURVEY

The R&D survey collects data on the inputs into R&D activities performed IN-HOUSE by all organizations (including higher education, government, business and not-for profit). The data are used for planning and monitoring purposes and for measuring international competitiveness.

This survey covers the Financial Year: 01/04/2021 to 31/03/2022 (or your nearest complete financial or academic year).

DUE DATE

Kindly review the questionnaire and compile the information required. An interviewer will contact you within one week to arrange for a meeting to collect the information.

ASSISTANCE

To assist you with queries kindly contact one of the survey managers:

Name	Contact Number	Email
Gernot Piepmeyer	061 4317069	gpiepmeyer@ncrst.na
Prof Paulina Kadhila	0812400892	npkadhila@unam.na

PERSON COMPLETING THE QUESTIONNAIRE:

Organization		Tel	(+264)
CEO/ Manager		Address	
Name of person completing (with title)		Business Physical address	
Designation		Cell	(+264)
Date		Email	
Signature		Website	

THE FOLLOWING DEFINITIONS ARE IMPORTANT IN THE COMPLETION OF THE SURVEY QUESTIONNAIRE:

Definition of R&D:

This survey follows the **Frascati Manual** guidelines for conducting survey on the inputs to R&D (OECD, 2002).
It defines research and experimental development (R&D) as:

- **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 their scientific knowledge for the creation of new or significantly improved products, applications or processes.

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.

Scope of survey:

- The survey requests data on **R&D performed IN-HOUSE by your organization** on the national territory.
- Part five includes some questions on "extramural R&D."

R&D in government research Institutions:

Any activity classified as R&D is characterised by originality; it should have investigation as a primary objective and should have the potential to produce results that are sufficiently general for humanity's stock of knowledge (theoretical and/or practical) to be recognisably increased.

R&D includes – but is not limited to:

Activities of personnel who are obviously engaged in R&D.
In addition, research activity includes:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D.
- The management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support or assistance to those R&D activities of students undertaking postgraduate research courses.
- Software development where the aim of the project is the systematic resolution of a scientific uncertainty.
- Research work in the natural sciences, engineering, medical sciences, agricultural sciences, social sciences and the humanities.
- R&D carried out as a participant in any unincorporated joint venture.
- R&D projects performed on contract for other legal entities, such as businesses.
- "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 specific activities are excluded, except where they are used primarily for the support of or as part of R&D activities performed in this reporting unit:

- Preparation for teaching.
- Academic development activities.
- 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.

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 service 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.

Borderline cases:

- Institutions (public research institutions and other government departments engaged in R&D) whose principal activity is R&D often have secondary, non-R&D activities (e.g. scientific and technical information, testing, quality control, analysis, background papers and studies for policymakers). Insofar as a secondary activity is undertaken primarily in the interests of R&D, it should be included in R&D activities; if the secondary activity is designed essentially to meet needs other than R&D, it should be excluded.
- S&T service institutions whose main purpose is an R&D-related scientific service/activity often undertake some research in connection with this activity. Such research should be isolated and included when measuring R&D.

PART 1: GENERAL INFORMATION

1. Parent organization/Department							
2. Name of reporting organization/unit							
3. Total number of all employees							

4. Did the reporting unit perform any IN-HOUSE R&D during the financial year?

Yes	☐	**Continue with Question 5.**
No	☐	**Proceed to Part 5 if you paid for R&D to other parties (optional).**
	☐	**If the organization/unit does not do any In-House and/or any extramural R&D, tick this box and return the questionnaire as a NIL response.**

PART 2: IN-HOUSE R&D PERSONNEL

R&D PERSONNEL

- Report against the categories listed below for all personnel employed directly in R&D or providing direct R&D services/support for at least 5% of their time. Do not count any staff NOT supporting research.
- Please report the average number of persons engaged in R&D during the reference year.
- Please include permanent, temporary, full-time, part-time and contract staff.

Researchers

- Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the planning and management of the projects concerned.
- Researchers include managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work. Their rank is usually equal or superior to that of persons directly employed as researchers and they are often former or part-time researchers.
- Excluded are managers and directors concerned primarily with budgets and human resources rather than project management or content (include in "other personnel directly supporting R&D").

Technicians directly supporting R&D

- Persons doing technical tasks in support of R&D, normally under the direction and supervision of a researcher.

Other personnel directly supporting R&D

- Other supporting staff includes skilled and unskilled crafts persons, secretarial and clerical staff participating in R&D projects or directly associated with such projects.
- Included are executives and directors concerned primarily with budgets and human resources in support of research rather than project management.
- Allowance for these should be made under overheads in R&D expenditure ("other current expenditure" in Question 7B) but such persons should not be included as R&D Personnel.

Note:

- Do not include personnel indirectly supporting R&D. Typical examples are transportation, storage, cleaning, repair, maintenance and security activities as well as administration and clerical activities undertaken not exclusively for R&D, such as the activities of central finance and personnel departments.

5. HEADCOUNT OF R&D PERSONNEL

CALCULATING HEADCOUNT (HC) DATA

HC data cover the total number of persons who are mainly or partially employed in R&D. This includes staff employed both full-time and part-time on R&D activities.

5.1 (a) Headcount of all R&D personnel according to three categories, Namibian or non-Namibian and highest qualification

(1) RESEARCHERS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL RESEARCHERS (1)					

* Indicate please how many of the males are Namibian
** Indicated please how many of the females are Namibian

(2) TECHNICIANS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL TECHNICIANS (2)					

(3) OTHER SUPPORT STAFF

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL OTHER SUPPORT STAFF (3)					

	M	Namibian*	F	Namibian**	TOTAL
TOTAL R&D PERSONNEL (1+2+3)					

5.2 (a) Headcount of all R&D personnel according to three categories, Namibian or non-Namibian and fields of science

(1) RESEARCHERS

Field of science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Field of Science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL TECHNICIANS					

3) OTHER SUPPORT STAFF

Field of Science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL OTHER SUPPORT STAFF					

5.3 (a) Headcount of all R&D personnel according to three categories, Namibian or non-Namibian and age

(1) RESEARCHERS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60-64 years					
65 years and more					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60-64 years					
65 years and more					
TOTAL TECHNICIANS					

(3) OTHER SUPPORT STAFF

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60-64 years					
65 years and more					
TOTAL OTHER SUPPORT STAFF					

6.RESEARCH FULL-TIME EQUIVALENTS (FTEs) AND COST TO GOVERNMENT INSTITUTIONS

Provide an estimate of person-years of effort on R&D (or full-time equivalents), according to the categories below.

Using the male and female headcounts of all R&D personnel reported for in Question 4, provide the research full-time equivalents (time devoted to R&D). Then, calculate the total labour costs of R&D using the average annual full cost-to-institution for full-time staff (including annual wages and salaries and all associated costs or fringe benefits, such as bonus payments, contributions to pension and medical aid funds, payroll tax, unemployment insurance fund and all other statutory payments) per category below.

CALCULATING FULL-TIME EQUIVALENT (FTE) PERSONS

FTE data measure the volume of human resources in R&D. One FTE may be thought of as one person-year. That is 1 FTE is equal to 1 person working full-time on R&D for a period of 1 year or more persons working part-time or for a shorter period corresponding to one person-year.

For the purpose of this survey, an employee can work a maximum of 1 FTE in a year.

The following is a theoretical approach to calculating FTE:

FTE: (Dedication to the employment: Full-time/Part-time) x (Portion of the year active on R&D) x (Time or portion spent on R&D)

See the following examples:

- A full-time employee spending 100% of time on R&D during a year: (1 x 1 x 1) = 1 FTE
- A full-time employee spending 30% of time on R&D during a year: (1 x 1 x 0.3) = 0.3 FTE
- A full-time R&D worker who is spending 100% of time on R&D and is employed at an R&D institution for only six months: (1 x 0.5 x 1) = 0.5 FTE
- A full-time employee spending 40% of time on R&D during half of the year (person is only active for 6 months per year): (1 x 0.5 x 0.4) = 0.2 FTE
- A part-time employee (working 40% of a full-time year) engaged only in R&D (spending 100% of time on R&D) during a year: (0.4 x 1 x 1) = 0.4 FTE
- A part-time employee (working 40% of a full time year) spending 60% of time on R&D during half of the year (person is only active for 6 months per year): (0.4 x 0.5 x 0.6) = 0.12 FTE
- 20 full-time employees spending 40% of time on R&D during a year: 20 x (1 x 1 x 0.4) = 8 FTE

NOTE: Please calculate FTEs for all R&D personnel.

6.1 FTE by personnel category

Personnel category	Headcounts (From Q 5.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
(1) RESEARCHERS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL RESEARCHERS (1)						
(2) TECHNICIANS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL TECHNICIANS (2)						

(3) OTHER SUPPORT STAFF

Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL OTHER SUPPORT STAFF (3)						

Personnel category	Headcounts (From Q 5.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
TOTAL R&D PERSONNEL (1+2+3)						

6.2 FTE by field of science in R&D activity

Field of science in R&D activity	Headcounts (From Q 5.2)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot

(1) RESEARCHERS

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL RESEARCHERS (same as 6.1)						

(2) TECHNICIANS

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL TECHNICIANS (same as 6.1)						

(3) OTHER SUPPORT STAFF

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL OTHER SUPPORT STAFF (same as 6.1)						

6.3 FTE by personnel category and labour cost

Personnel categories	Full Time Equivalent (FTE) (From Q 6.1) (A)	Average annual labour cost per person Local Currency '000 (Excl. VAT) (B)	Calculated labour cost of R&D Local Curr. '000 (Excl. VAT) (A x B)
Total researchers (1)			
Total technicians (2)			
Total other support staff (3)			
TOTAL LABOUR COST (1+2+3)			

Carry subtotal over to Q 7A

PART 3: IN-HOUSE R&D EXPENDITURE

THE DEFINITION AND CALCULATION OF IN-HOUSE R&D EXPENDITURE
OTHER CURRENT EXPENDITURE

Including – but not limited to:

- Direct project costs, project consumables and running costs linked to research, such as materials, fuels and other inputs, including telephone and printing.
- Subsistence and travel expenses.
- Repair and maintenance expenses.
- Payments to outside organizations for use of specialised testing facilities, analytical work, engineering or other specialised services in support of R&D projects carried out by this reporting unit.
- Commission/consultant expenses for research projects carried out by this reporting unit.
- The relevant % of indirect and institutional costs and utility costs such as rent, space charge, leasing and hiring expenses, furniture, water, electricity and any other overhead costs.
- The relevant % of labour costs of persons providing indirect services such as the head office, human resources, finances, security and maintenance personnel as well as staff of central libraries and IT departments.
- Where current expenses such as direct project costs and consumables are used solely for R&D, allocate the full cost of the items.
- If these current expenses are used for more than one activity, include only an estimate of the portion used for R&D.
- Only where such an estimate of the portion used for R&D is not available, such as indirect and utility costs and labour costs of staff providing indirect services, it is advised that respondents apply the percentage time that researchers in the reporting unit spent on R&D to the total of these current expenditures.
- So, if the income and expenditure statement shows that the current expenditure for indirect and utility costs and labour costs of staff providing indirect services for the year was say USD 1.700.000 and that researchers on average spent 80% of their time on R&D, then this component of R&D current expenditure may be estimated as 0.8 x USD 1.700.000 = USD 1.360.000.

Excluding:

- Contract R&D expenses where the research project is carried out elsewhere by others on behalf of this reporting unit.
- Payments for purchases of technical know-how (goodwill).
- Licence fees.
- Depreciation provisions.

CAPITAL EXPENDITURE

The full cost of capital expenses must be reported in the year of purchase (do not depreciate).

Including – but not limited to:	**Excluding:**
• Expenditure on fixed assets used in the R&D projects of this reporting unit. • Acquisition of software, including license fees, expected to be used for more than one year. • Purchase of databases expected to be used for more than one year. • Major repairs, improvements and modifications on land and buildings. • Where a capital item is used solely for R&D, allocate the full cost of the item.	• Other repairs and maintenance expenses. • Depreciation provisions. • Proceeds from the sale of R&D assets.

- If the capital item is used for more than one activity, include only an estimate of the portion used for R&D. For example, a new piece of equipment that will be used for R&D (included), testing (excluded) and quality control (excluded). For instance, if the intended use of this new equipment for R&D purposes is 40% of the total usage (i.e. the other 60% for other activities), only 40% of the total equipment cost should be considered as relevant R&D expenditure.
- Only where such an estimate of the portion used for R&D is not available, apply the percentage time that researchers in the reporting unit spent on R&D to the cost of the item.

7. IN-HOUSE R&D EXPENDITURE

Compile expenditure on IN-HOUSE R&D during the fiscal year ...<YYYY>... Include expenditure funded from all sources: internal and external (contracts and grants) and undertaken by the reporting unit on its own behalf or for other parties.
PLEASE NOTE: Extramural R&D should be reported under Part 5.

Purchase of equipment can in theory be classified as either capital or current expenditure. A distinction can therefore be made between "major" and "minor" equipment (to be included in "capital" and "current" expenditures, respectively) by establishing some kind of monetary limitation. Please provide us with this limitation as used by your institution.	
Local currency:	

LABOUR COSTS OF R&D

		Local currency '000 excluding VAT
Total cost of R&D personnel (carried over from Question 6.3)	A	

OTHER CURRENT EXPENDITURE ON R&D
(See the definition of current expenditure and how to calculate current expenditure devoted to R&D on the previous page)

		Local currency '000 excluding VAT
Other current expenditure	B	

CAPITAL EXPENDITURE ON R&D
(See the definition of capital expenditure and how to calculate capital expenditure on R&D on the previous page)

		Local currency '000 excluding VAT
Vehicles, plant, machinery and equipment	C	
Land, buildings and other structures	D	
Software	E	

		Local currency '000 excluding VAT
TOTAL R&D EXPENDITURE (A + B + C + D + E)	F	

Carry total R&D expenditure (F) over to Question 8

8. SOURCES OF FUNDS FOR IN-HOUSE R&D

Provide a breakdown of the total R&D expenditure according to the sources of funds listed below (NOTE: Only the proportion of the money actually SPENT is required not the total income per source)

Organization	Local currency '000 excluding VAT
Own funds	

Other government (includes departments/ministries and grant-making institutes)

Grants, especially general purpose, including studentships	
Contracts to perform directed R&D	
Total	

Local businesses

Contracts to perform R&D	

Other national sources

Not-for-profit organizations (including foundations)	
Individual donations	
Higher education	
Total	

Foreign sources

Foreign funds	

Of above total foreign sources, indicate the % from:

RSA	Rest of Africa	EU	Rest of Europe	China	Rest of Asia	USA/ Canada	Other	Total %

	Local currency '000 excluding VAT
TOTAL R&D EXPENDITURE (to equal Question 7F)	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE

9. 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 (optional) b) total IN-HOUSE R&D CURRENT expenditure (labour costs and other current cost) by type of R&D.

Column b

BASIC RESEARCH — OPTIONAL

	a). Based on total Intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		
• 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 usually published in peer-reviewed scientific journals.						

APPLIED RESEARCH

	a). Based on total Intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		
• 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.						

EXPERIMENTAL DEVELOPMENT

	a). Based on total Intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		
• Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed.						
TOTAL	1	0	0	1	0	0

10. DETAILED FIELDS OF SCIENCE (FOS)

Classify R&D according to two-digit field of science (FoS) with associated percentage expenditure (see Appendix A)

- The FoS codes are based on recognised academic disciplines and emerging areas of study.

FoS codes		Percentage		FoS codes		Percentage	
FoS				FoS			
FoS				FoS			
FoS				FoS			
FoS				FoS			
FoS				FoS			
FoS				FoS			
				Total	1	0	0

11. SOCIO-ECONOMIC OBJECTIVES (SEO)

Classify R&D according to socio-economic objective with associated percentage expenditure (see Appendix B)

- The SEO classification provides an indication of the main beneficiary of your R&D activities.

SEO codes			Percentage		SEO codes			Percentage	
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
					Total			0	0

12. Kindly indicate geographic the location where the reporting unit carried out R&D activities and the percentage of the total R&D expenditure

Specify where R&D activities actually take place, rather than where they are managed /financed from.

Region	Percentage (%)	Ohangwena	
Erongo		Omaheke	
Hardap		Omusati	
Karas		Oshana	
Kavango East		Oshikoto	
Kavango West		Otjozondjupa	
Khomas		Zambezi	
Kunene		TOTAL	100%

13. COLLABORATIVE R&D

13a. Does your company collaborate on R&D with persons/organisations outside your own organisation? Tick as appropriate

No	Go to Part 5
Yes	Continue with Question 13b

13b. With whom is R&D conducted in partnerships, alliances or collaboration? Tick as appropriate

Instruction

Note: In the table below a single collaborative R&D project with several partners may be ticked in several places. Collaborative R&D may be intramural or extramural. R&D collaboration can occur without expenditure – please note zero expenditure in such cases.

	Namibia	RSA	Rest of Africa	EU	Rest of Europe	China	Rest of Asia	USA/ Canada	Other
Higher Education Institutions									
Science Councils									
Government Research Institutes									
Members of own organisation/ Affiliate organisations									
Households									
Informal Businesses									
Indigenous Knowledge									
Other Companies (including specialist consultants, business and trade associations)									
Not-for-Profit Organisations									

R&D322 – 001
Enumerator Unique Number
_____

STRICTLY CONFIDENTIAL
THANK YOU FOR YOUR TIME AND EFFORT

HIGHER EDUCATION R&D SURVEY

QUESTIONAIRRE 3

NATIONAL SURVEY OF RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D) INPUTS	
HIGHER EDUCATION - FINANCIAL YEAR 2021/2022 (or 2020/2021)	
Organization	Please modify address label (only if there is one)

AUTHORITY

The National Commission on Research Science and Technology (NCRST) established in accordance with Section 4 of the Research, Science and Technology Act, 2004 (Act 23 of 2004 is mandated to conduct a survey of inputs into Research and experimental Development (R&D).

All data gathered for this survey are confidential. Only the survey team sees individual organization data. Raw data gathered for this survey is confidential except when an organization gives written permission for its data to be disclosed to other parties.

PURPOSE AND SCOPE OF SURVEY

The R&D survey collects data on the inputs into R&D activities performed IN-HOUSE by all organizations (including higher education, government, business enterprise and not-for profit). The data are used for planning and monitoring purposes and for measuring international competitiveness.

This survey covers the Financial Year: 01/04/2021 to 31/03/2022 (or your nearest complete financial or academic year).

DUE DATE

Kindly review the questionnaire and compile the information required. An interviewer will contact you within one week to arrange for a meeting to collect the information.

ASSISTANCE

To assist you with queries kindly contact one of the survey managers:

Name	Contact Number	Email
Gernot Piepmeyer	061 4317069	gpiepmeyer@ncrst.na
Prof Paulina Kadhila	0812400892	npkadhila@unam.na

PERSON COMPLETING THE QUESTIONNAIRE:

Organization		Tel	(+264)
CEO/ Manager		Address	
Name of completing person (with title)		Business Physical address	
Designation		Cell	(+264)
Date		Email	
Signature		Website	

THE FOLLOWING DEFINITIONS ARE IMPORTANT IN THE COMPLETION OF THIS QUESTIONNAIRE:

Definition of R&D:

This survey follows the **Frascati Manual** guidelines for conducting survey on the inputs to R&D (OECD, 2002).
It defines research and experimental development (R&D) as:

- **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 their scientific knowledge for the creation of new or significantly improved products, applications or processes.

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.

Scope of survey:

- The survey requests data on **R&D performed IN-HOUSE by your organization** in the national territory.
- Part five includes some questions on "extramural R&D".

R&D in higher education institutions:

Any activity classified as R&D is characterised by originality; it should have investigation as a primary objective and should have the potential to produce results that are sufficiently general for humanity's stock of knowledge (theoretical and/or practical) to be recognisably increased.

R&D includes – but is not limited to:

Activities of personnel who are obviously engaged in R&D.
In addition, research activity includes:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D.
- The management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support or assistance to those R&D activities of students undertaking postgraduate research courses.
- Software development where the aim of the project is the systematic resolution of a scientific uncertainty.
- Research work in the natural sciences, engineering, medical sciences, agricultural sciences, social sciences and the humanities.
- R&D carried out as a participant in any unincorporated joint venture.

R&D excludes:

The following specific activities are excluded except where they are used primarily for the support of or as part of R&D activities performed in this reporting unit:

- Preparation for teaching.
- Academic development activities.
- 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.

The classification of borderline institutions:

Research institutes (such as specialised health care clinics or "attached" research institutions) that are not directly concerned with third-level teaching but host activities, R&D or otherwise, that are all the same closely associated with the higher education sector should be carefully considered:

- Entities initiated by a higher education institution (HEI) but subsequently became a not-for-profit or business entity should be classified as such and surveyed by not-for profit or business sectors even if there are close links with an HEI.
- Staff and R&D expenditure should be reported where it was incurred.
- Staff members on the payroll of the HEI (e.g. department heads) should be reported by the HEI concerned.
- Staff that appears on the payroll of the "borderline" institution should be reported by the institution concerned and not the HEI.
- The same applies to equipment and running costs.
- It would be appreciated if we were informed of all such institutions to ensure that they are surveyed by the appropriate sectors and to minimise double counting.

Government/academic hospitals:

Higher education institutions (HEIs) are requested to report on all academic and technical staff performing R&D with joint appointments between government/academic hospitals and the HEI. This includes headcount, FTEs, labour costs, equipment and running costs.

It is understood that some of these costs may not be reflected in the HEI's Management Information System data or financial statements but we request that a best estimate be included where necessary.

PART 1: GENERAL INFORMATION

1. Name of higher education institution	
2. Name of reporting unit (e.g. faculty)	

3. Did the reporting unit perform any IN-HOUSE R&D during the fiscal year?

Yes	☐	**Continue with Question 4.**
No	☐	**Proceed to Part 5 if you paid for R&D to other parties (optional).**
	☐	**If the organization/unit does not do any In-House and/or any extramural R&D, tick this box and return the questionnaire as a NIL response.**

PART 2: IN-HOUSE R&D PERSONNEL

R&D PERSONNEL

- Report against the categories listed below for all personnel employed directly in R&D or providing direct R&D services/support for at least 5% of their time. Do not count any staff NOT supporting research.
- Please report the average number of persons engaged in R&D during the reference year.
- Please include permanent, temporary, full-time, part-time and contract staff.

1. Researchers
INCLUDE:

- Academic staff engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the direct management of the projects concerned.
- Managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work. Their rank is usually equal or superior to that of persons directly employed as researchers and they are often former or part-time researchers.
- Academic staff involved in research and also studying towards a Master's or Doctoral degree should be included as research staff (not students).
- All post-doctoral fellows in whichever capacity they are appointed by the institution.
- Doctoral students working on R&D.

EXCLUDE:

- Managers and directors concerned primarily with budgets and human resources rather than project management or content (include in "other personnel directly supporting R&D").
- Master's students.

2. Technicians
INCLUDE:

- Persons performing technical tasks in support of R&D, normally under the direction & supervision of a researcher.

3. Other personnel directly supporting R&D
INCLUDE:

3.1 Executive and managerial level

- Executives and directors concerned primarily with budgets and human resources in support of research rather than project management.

3.2 Administrative and support staff

- Skilled and unskilled craft workers directly supporting research.
- Secretarial, administrative and clerical personnel supporting/working on or directly associated with R&D activity.

EXCLUDE:

- Persons providing indirect services, such as security and maintenance personnel, staff of central libraries, IT departments or head offices, should be excluded here but the relevant proportion of their labour costs should be included under "other current costs" in Question 6B.

4. HEADCOUNT OF R&D PERSONNEL

CALCULATING HEADCOUNT (HC) DATA
HC data cover the total number of persons who are mainly or partially employed in R&D. This includes staff employed both full-time and part-time on R&D activities.

4.1 (a) Headcount of all R&D personnel according to three categories and highest qualification

4.1 Headcount of all R&D personnel according to three categories, Namibian or non-Namibian and highest qualification

(1) RESEARCHERS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL RESEARCHERS (1)					

* Indicate please how many of the males are Namibian
** Indicated please how many of the females are Namibian

(2) TECHNICIANS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL TECHNICIANS (2)					

(3) OTHER SUPPORT STAFF

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL OTHER SUPPORT STAFF (3)					

	M	Namibian*	F	Namibian**	TOTAL
TOTAL R&D PERSONNEL (1+2+3)					

4.2 Headcount of all R&D personnel according to three categories, Namibian or non-Namibian and fields of science

(1) RESEARCHERS

Field of science	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Field of Science	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL TECHNICIANS					

(3) OTHER SUPPORT STAFF

Field of Science	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL OTHER SUPPORT STAFF					

4.3 Headcount of all R&D personnel according to three categories, Namibian or non-Namibian and age

(1) RESEARCHERS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60-64 years					
65 years and more					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60-64 years					
65 years and more					
TOTAL TECHNICIANS					

(3) OTHER SUPPORT STAFF

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60-64 years					
65 years and more					
TOTAL OTHER SUPPORT STAFF					

5. RESEARCH FULL-TIME EQUIVALENTS (FTEs) AND COST TO HIGHER EDUCATION INSTITUTIONS

Provide an estimate of person-years of effort on R&D (or Full-time equivalents), according to the categories below.

Using the male and female headcounts of all R&D personnel reported for in Question 4, provide the research full-time equivalents (time devoted to R&D). Then, calculate the total labour costs of R&D using the average annual full cost-to-company for full-time staff (including annual wages, salaries and all associated costs or fringe benefits, such as bonus payments, contributions to pension and medical aid funds, payroll tax, unemployment insurance fund and all other statutory payments) per category below.

CALCULATING FULL-TIME EQUIVALENT (FTE) PERSONS

FTE data measure the volume of human resources in R&D. One FTE may be thought of as one person-year. That is 1 FTE is equal to 1 person working full-time on R&D for a period of 1 year or more persons working part-time or for a shorter period corresponding to one person-year.

For the purpose of this survey, an employee can work a maximum of 1 FTE in a year.

The following is a theoretical approach to calculating FTE:

FTE: (Dedication to the employment: Full-time/Part-time) x (Portion of the year active on R&D) x (Time or portion spent on R&D)

See the following examples:

- A full-time employee spending 100% of time on R&D during a year: (1 x 1 x 1) = 1 FTE
- A full-time employee spending 30% of time on R&D during a year: (1 x 1 x 0.3) = 0.3 FTE
- A full-time R&D worker who is spending 100% of time on R&D and is employed at an R&D institution for only six months: (1 x 0.5 x 1) = 0.5 FTE
- A full-time employee spending 40% of time on R&D during half of the year (person is only active for 6 months per year): (1 x 0.5 x 0.4) = 0.2 FTE
- A part-time employee (working 40% of a full time year) engaged only in R&D (spending 100% of time on R&D) during a year: (0.4 x 1 x 1) = 0.4 FTE
- A part-time employee (working 40% of a full-time year) spending 60% of time on R&D during half of the year (person is only active for 6 months per year): (0.4 x 0.5 x 0.6) = 0.12 FTE
- 20 full-time employees spending 40% of time on R&D during a year: 20 x (1 x 1 x 0.4) = 8 FTE

NOTE: please calculate FTEs for all R&D personnel.

5.1 FTE by personnel category

Personnel category	Headcounts (From Q 4.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
(1) RESEARCHERS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL RESEARCHERS (1)						
(2) TECHNICIANS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL TECHNICIANS (2)						

(3) OTHER SUPPORT STAFF

Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL OTHER SUPPORT STAFF (3)						

Personnel category	Headcounts (from Q 4.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
TOTAL R&D PERSONNEL (1+2+3)						

5.2 FTE by field of science

Field of science	Headcounts (from Q 4.2)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot

(1) RESEARCHERS

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL RESEARCHERS						

(2) TECHNICIANS

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL TECHNICIANS						

(3) OTHER SUPPORT STAFF

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL OTHER SUPPORT STAFF						

5.3 FTE by personnel category and labour cost

Personnel categories	Full Time Equivalent (FTE) (From Q 5.1) (A)	Average annual labour cost per person Local Currency '000 (Excl. VAT) (B)	Calculated labour cost of R&D Local Curr. '000 (Excl. VAT) (A x B)
Total researchers (1)			
Total technicians (2)			
Total other support staff (3)			
TOTAL LABOUR COST (1+2+3)			

PART 3: IN-HOUSE/INTRAMURAL R&D EXPENDITURE

THE DEFINITION AND CALCULATION OF IN-HOUSE R&D EXPENDITURE
OTHER CURRENT EXPENDITURE

Including – but not limited to:

- Direct project costs, project consumables and running costs linked to research, such as materials, fuels and other inputs, including telephone and printing.
- Subsistence and travel expenses.
- Repair and maintenance expenses.
- Payments to outside organizations for use of specialised testing facilities, analytical work, engineering or other specialised services in support of R&D projects carried out by this reporting unit.
- Commission/consultant expenses for research projects carried out by this reporting unit.
- The relevant % of indirect and institutional costs and utility costs, such as rent, space charge, leasing and hiring expenses, furniture, water, electricity and any other overhead costs.
- The relevant % of labour costs of persons providing indirect services such as the head office, human resources, finances, security and maintenance personnel as well as staff of central libraries and IT departments.

- Where current expenses such as direct project costs and consumables are used solely for R&D, allocate the full cost of the items.
- If these current expenses are used for more than one activity, include only an estimate of the portion used for R&D.
- Only where such an estimate of the portion used for R&D is not available, such as indirect and utility costs and labour costs of staff providing indirect services, it is advised that respondents apply the percentage time that researchers in the reporting unit spent on R&D to the total of these current expenditures.
- So if a faculty's income and expenditure statement shows that the current expenditure for indirect and utility costs and labour costs of staff providing indirect services for the year was say USD 1.700.000 and that researchers on average spent 22% of their time to R&D, then this component of R&D current expenditure may be estimated as 0.22 x USD 1.700.000 = USD 374.000.

Excluding:

- Contract R&D expenses where the research project is carried out elsewhere by others on behalf of this reporting unit.
- Payments for purchases of technical know-how (goodwill).
- Licence fees.
- Depreciation provisions.

CAPITAL EXPENDITURE

The full cost of capital expenses must be reported in the year of purchase (do not depreciate).

Including – but not limited to:

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

Excluding:

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

- Where a capital item is used solely for R&D, allocate the full cost of the item.
- If the capital item is used for more than one activity, include only an estimate of the portion used for R&D. For example, a new piece of equipment that will be used for R&D (included), testing (excluded) and quality control (excluded). For instance, if the intended use of this new equipment for R&D purposes is 40% of the total usage (i.e. the other 60% for other activities), only 40% of the total equipment cost should be considered as relevant R&D expenditure.
- Only where such an estimate of the portion used for R&D is not available, apply the percentage time that researchers in the reporting unit spent on R&D to the cost of the item.

Excluding:

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

6. IN-HOUSE/INTRAMURAL R&D EXPENDITURE

Compile expenditure on IN-HOUSE R&D during the fiscal year ...<YYYY>... Include expenditure funded from all sources: internal and external (contracts and grants) and undertaken by the reporting unit on its own behalf or for other parties.

PLEASE NOTE: Extramural R&D should be reported under Part 5.

Purchase of equipment can in theory be classified as either capital or current expenditure. A distinction can therefore be made between "major" and "minor" equipment (to be included in "capital" and "current" expenditures respectively) by establishing some kind of monetary limitation. Please provide us with this limitation as used by your institution.

Local currency:

LABOUR COSTS OF R&D

		Local currency '000 excluding VAT
Total cost of R&D personnel (carried over from Question 5.3)	A	

OTHER CURRENT EXPENDITURE ON R&D
(See the definition of current expenditure and how to calculate current expenditure devoted to R&D on the previous page)

		Local currency '000 excluding VAT
Other current expenditure	B	

CAPITAL EXPENDITURE ON R&D
(See the definition of capital expenditure and how to calculate capital expenditure on R&D on the previous page)

		Local currency '000 excluding VAT
Vehicles, plant, machinery and equipment	C	
Land, buildings and other structures	D	
Software	E	

		Local currency '000 excluding VAT
TOTAL R&D EXPENDITURE (A + B + C + D + E)	F	

Carry total R&D expenditure (F) over to Question

7. SOURCES OF FUNDS FOR IN-HOUSE/INTRAMURAL R&D

Provide a breakdown of the total R&D expenditure according to the sources of funds listed below (NOTE: Only the proportion of the money actually SPENT is required, not the total income per source)
To adapt to national context

OWN AND EXTERNAL SOURCES SPENT ON R&D		Local currency '000 excluding VAT
University's own sources*		
Direct grants from national, federal state, provincial and local government		
Government research institutes		
Agency funding		
Domestic business including industry funds		
Other NATIONAL sources		
• Other higher education institutions		
• Not-for-profit organizations		
• Donations and bequests from individuals		
Foreign sources		
SUBTOTAL OWN AND EXTERNAL SOURCES	G	

* University's own sources include income from endowments, shareholdings, property, student fees and subscriptions to journals.

THE CALCULATION OF GENERAL UNIVERSITY FUNDS

To calculate general university funds please subtract the subtotal of all own and external sources listed above (G) from the total in-house R&D expenditure reported in Question 8 (F). The result can be considered general university funds, which is the R&D part of the government block grant to universities.

To adapt to national context

Total R&D EXPENDITURE (carried over from Q 6)	F	
SUB TOTAL (EXTERNAL SOURCES) (carried over from Q 7G above)	G	
GENERAL UNIVERSITY FUNDS	F - G	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE

8. IN-HOUSE R&D EXPENDITURE BY TYPE OF R&D

Specify the percentage of IN-HOUSE TOTAL R&D expenditure (both current costs and capital expenditure) by type of R&D e.g. Basic Research 30 %

Type of R&D Activity	
Basic Research is experimental or theoretical work undertaken primarily to acquire new knowledge without a specific application in view. It is carried out without looking for any long-term economic or social benefits other than for the advancement of knowledge.	
Applied Research involves original work to acquire new knowledge with a specific application in view. It also involves research to determine possible uses from the findings of the basic research or to determine new methods or ways of achieving some specific or pre-determined objectives.	
Experimental Development are research involving systematic work using existing knowledge gained from other research and/or practical experience for the purpose of creating new or improved materials, equipment, products, system and processes or services.	
TOTAL	**100%**

9. DETAILED FIELDS OF SCIENCE (FOS)

Classify R&D according to two-digit field of science (FoS) with associated percentage expenditure (see Appendix A)

- The FoS codes are based on recognised academic disciplines and emerging areas of study.

FoS codes			Percentage		FoS codes			Percentage	
FoS					FoS				
FoS					FoS				
FoS					FoS				
FoS					FoS				
FoS					FoS				
FoS					FoS				
					Total			0	0

10. SOCIO-ECONOMIC OBJECTIVES (SEO)

Classify R&D according to socio-economic objective (SEO) with associated percentage expenditure (see Appendix B)

- The SEO classification provides an indication of the main beneficiary of your R&D activities.

SEO codes			Percentage		SEO codes			Percentage	
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
SEO					SEO				
					Total		1	0	0

11. REGIONAL EXPENDITURE ON R&D

Kindly indicate geographic the location where the reporting unit carried out R&D activities and the percentage of the total R&D expenditure

Specify where R&D activities actually take place, rather than where they are managed /financed from.

Region	Percentage (%)	Ohangwena	
Erongo		Omaheke	
Hardap		Omusati	
Karas		Oshana	
Kavango East		Oshikoto	
Kavango West		Otjozondjupa	
Khomas		Zambezi	
Kunene		TOTAL	100%

12. COLLABORATIVE R&D

12a. Does your company collaborate on R&D with persons/organisations outside your own organisation? Tick as appropriate

No	Go to Part 5
Yes	Continue with Question 12b

12b. With whom is R&D conducted in partnerships, alliances or collaboration? Tick as appropriate
Instruction

Note: In the table below a single collaborative R&D project with several partners may be ticked in several places. Collaborative R&D may be intramural or extramural. R&D collaboration can occur without expenditure – please note zero expenditure in such cases.

	Namibia	RSA	Rest of Africa	EU	Rest of Europe	China	Rest of Asia	USA/ Canada	Other
Higher Education Institutions									
Science Councils									
Government Research Institutes									
Members of own organisation/ Affiliate organisations									
Households									
Informal Businesses									
Indigenous Knowledge									
Other Companies (including specialist consultants, business and trade associations)									
Not-for-Profit Organisations									

PART 5: EXTRAMURAL R&D

Extramural R&D refers to:

- Extramural expenditures are the sums a reporting unit 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 (FM § 408).

	Approximate value Local currency '000 (excl. VAT)
13. State details of extramural R&D paid locally	
14. State details of extramural R&D paid abroad	

15. If the amounts stated in Question 13 or 14 are in excess of 1 million units of national currency please indicate the name of the organization(s) that conducted the extramural R&D with the associated expenditure.

State details of extramural R&D paid locally.

Paid to:	Approximate value Local currency '000s (excl. VAT)

State details of extramural R&D paid abroad.

Paid to:	Approximate value Local currency '000s (excl. VAT)

R&D422 – 001
Enumerator Unique Number

STRICTLY CONFIDENTIAL
THANK YOU FOR YOUR TIME AND EFFORT

NOT FOR PROFIT R&D SURVEY

QUESTIONAIRRE 4

NATIONAL SURVEY OF RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D) INPUTS	
PRIVATE NON-PROFIT - FINANCIAL YEAR 2021/2022 (or 2020/2021)	
Organization	Please modify address label (only if there is one)

AUTHORITY

The National Commission on Research Science and Technology (NCRST) established in accordance with Section 4 of the Research, Science and Technology Act, 2004 (Act 23 of 2004 is mandated to conduct a survey of inputs into Research and experimental Development (R&D)

All data gathered for this survey are confidential. Only the survey team sees individual organization data. Raw data gathered for this survey is confidential except when an organization gives written permission for its data to be disclosed to other parties.

PURPOSE AND SCOPE OF SURVEY

The R&D survey collects data on the inputs into R&D activities performed IN-HOUSE by all organizations (including higher education, government, business and not-for profit). The data are used for planning and monitoring purposes and for measuring international competitiveness.

This survey covers the Financial Year: 01/04/2021 to 31/03/2022 (or your nearest complete financial or academic year).

DUE DATE

Kindly review the questionnaire and compile the information required. An interviewer will contact you within one week to arrange for a meeting to collect the information.

ASSISTANCE

To assist you with queries kindly contact one of the survey managers:

Name	Contact Number	Email
Gernot Piepmeyer	061 4317069	gpiepmeyer@ncrst.na
Prof Paulina Kadhila	0812400892	npkadhila@unam.na

PERSON COMPLETING THE QUESTIONNAIRE:

Organization		Tel	(+264)
CEO/ Manager		Address	
Name of person completing (with title)		Business Physical address	
Designation		Cell	(+264)
Date		Email	
Signature		Website	

THE FOLLOWING DEFINITIONS ARE IMPORTANT IN THE COMPLETION OF THE SURVEY QUESTIONNAIRE:

Definition of R&D:

This survey follows the **Frascati Manual** guidelines for conducting survey on the inputs to R&D (OECD, 2002).
It defines research and experimental development (R&D) as:

- **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 their scientific knowledge for the creation of new or significantly improved products, applications or processes.

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.

Scope of survey:

- The survey requests data on **R&D performed IN-HOUSE by your organization** in the national territory.
- Part five includes some questions on extramural R&D.

R&D in private non-profit institutions:

Any activity classified as R&D is characterised by originality; it should have investigation as a primary objective and should have the potential to produce results that are sufficiently general for humanity's stock of knowledge (theoretical and/or practical) to be recognisably increased.

R&D includes – but is not limited to:

Activities of personnel who are obviously engaged in R&D.
In addition, research activity includes:

- The provision of professional, technical, administrative or clerical support and/or assistance to personnel directly engaged in R&D.
- The management of personnel who are either directly engaged in R&D or are providing professional, technical or clerical support or assistance to those R&D activities of students undertaking postgraduate research courses.
- Supervision and monitoring of postgraduate research courses, including students.
- Software development where the aim of the project is the systematic resolution of a scientific uncertainty.
- Research work in the natural sciences, engineering, medical sciences, agricultural sciences, social sciences and the humanities.
- R&D carried out as a participant in any unincorporated joint venture.
- R&D projects performed on contract for other legal entities, such as businesses.
- "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 specific activities are excluded except where they are used primarily for the support of or as part of R&D activities performed in this reporting unit:

- 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.

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 service 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.

PART 1: GENERAL INFORMATION

1. Organization/Institution	
2. Sub-unit (if applicable)	

3. Approximate foreign/local ownership split

(By ultimate ownership if complex holding structures exist.)

Foreign	%
National	%
TOTAL	100%

4.Financial year (dd/mm/yyyy) for which you are reporting in this survey

From	**to**

5. Total number of employees (include staff on contract for six months or longer)							
6. Gross revenue (Local currency '000 excl. VAT)							

7. Did the reporting unit perform any IN-HOUSE R&D during the financial year?

Yes ☐ Continue with Question 8.

No ☐ Proceed to Part 5 if you paid for R&D to other parties (optional).

☐ If the organization/unit does not do any In-House and/or any extramural R&D, tick this box and return the questionnaire as a NIL response.

PART 2: IN-HOUSE R&D PERSONNEL

R&D PERSONNEL

- Report against the categories listed below for all personnel employed directly in R&D or providing direct R&D services/support for at least 5% of their time. Do not count any staff NOT supporting research.
- Please report the average number of persons engaged in R&D during the reference year.
- Please include permanent, temporary, full-time, part-time and contract staff.

Researchers

- Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, and also in the planning and management of the projects concerned.
- Researchers include managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work. Their rank is usually equal or superior to that of persons directly employed as researchers and they are often former or part-time researchers.
- Excluded are managers and directors concerned primarily with budgets and human resources, rather than project management or content (include in "other personnel directly supporting R&D").

Technicians directly supporting R&D

- Persons doing technical tasks in support of R&D, normally under the direction and supervision of a researcher.

Other personnel directly supporting R&D

- Other supporting staff includes skilled and unskilled crafts persons, secretarial and clerical staff participating in R&D projects or directly associated with such projects.
-
- Included are executives and directors concerned primarily with budgets and human resources in support of research rather than project management.
-
- Allowance for these should be made under "overheads in R&D expenditure" ("other current expenditure" in Question 10B) but such persons should not be included as R&D personnel.

Note:

- Do not include personnel indirectly supporting R&D. Typical examples are transportation, storage, cleaning, repair, maintenance and security activities, as well as administration and clerical activities undertaken not exclusively for R&D (such as the activities of central finance and personnel departments).

8. HEADCOUNT OF R&D PERSONNEL

CALCULATING HEADCOUNT (HC) DATA
HC data cover the total number of persons who are mainly or partially employed in R&D. This includes staff employed both full-time and part-time on R&D activities.

8.1 Headcount of all R&D personnel according to three categories, Namibian and non-Namibian and highest qualification

(1) RESEARCHERS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL RESEARCHERS (1)					

* Indicate please how many of the males are Namibian
** Indicated please how many of the females are Namibian

(2) TECHNICIANS

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL TECHNICIANS (2)					

(3) OTHER SUPPORT STAFF

Highest qualification	M	Namibian*	F	Namibian**	TOTAL
Doctoral or equivalent level (ISCED level 8)					
Master's or equivalent level (ISCED level 7)					
Bachelor's or equivalent level (ISCED level 6)					
Short-cycle tertiary education (ISCED level 5)					
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)					
TOTAL OTHER SUPPORT STAFF (3)					

	M	Namibian*	F	Namibian**	TOTAL
TOTAL R&D PERSONNEL (1+2+3)					

8.2 Headcount of all R&D personnel according to three categories, Namibian and non-Namibian and fields of science

(1) RESEARCHERS

Field of science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Field of science in R & D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL TECHNICIANS					

(3) OTHER SUPPORT STAFF

Field of science in R&D activity	M	Namibian*	F	Namibian**	TOTAL
Natural sciences					
Engineering and technology					
Medical and health sciences					
Agricultural sciences					
Social sciences					
Humanities					
Not specified elsewhere (crosscutting or multidisciplinary)					
TOTAL OTHER SUPPORT STAFF					

8.3 Headcount of all R&D personnel according to three categories, Namibian and non-Namibian and age

(1) RESEARCHERS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55- 59 years					
60 years and more					
TOTAL RESEARCHERS					

(2) TECHNICIANS

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55- 59 years					
60 years and more					
TOTAL TECHNICIANS					

(3) OTHER SUPPORT STAFF

Age	M	Namibian*	F	Namibian**	TOTAL
Under 25 years					
25-34 years					
35-44 years					
45-54 years					
55-59 years					
60 years and more					
TOTAL OTHER SUPPORT STAFF					

9. RESEARCH FULL-TIME EQUIVALENTS (FTEs) AND COST TO PRIVATE NON-PROFIT INSTITUTIONS

Provide an estimate of person-years of effort on R&D (or full-time equivalents), according to the categories below.

Using the male and female headcounts of all R&D personnel reported for in Question 4, provide the research full-time equivalents (time devoted to R&D). Then, calculate the total labour costs of R&D using the average annual full cost-to-institution for full-time staff (including annual wages and salaries and all associated costs or fringe benefits, such as bonus payments, contributions to pension and medical aid funds, payroll tax, unemployment insurance fund and all other statutory payments) per category below.

CALCULATING FULL-TIME EQUIVALENT (FTE) PERSONS

FTE data measure the volume of human resources in R&D. One FTE may be thought of as one person-year. That is 1 FTE is equal to 1 person working full-time on R&D for a period of 1 year or more persons working part-time or for a shorter period corresponding to one person-year.

For the purpose of this survey, an employee can work a maximum of 1 FTE in a year.

The following is a theoretical approach to calculating FTE:

FTE: (Dedication to the employment: Full-time/Part-time) x (Portion of the year active on R&D) x (Time or portion spent on R&D)

See the following examples:

- A full-time employee spending 100% of time on R&D during a year: (1 x 1 x 1) = 1 FTE
- A full-time employee spending 30% of time on R&D during a year: (1 x 1 x 0.3) = 0.3 FTE
- A full-time R&D worker who is spending 100% of time on R&D, is employed at an R&D institution for only six months: (1 x 0.5 x 1) = 0.5 FTE
- A full-time employee spending 40% of time on R&D during half of the year (person is only active for 6 months per year): (1 x 0.5 x 0.4) = 0.2 FTE
- A part-time employee (working 40% of a full-time year) engaged only in R&D (spending 100% of time on R&D) during a year: (0.4 x 1 x 1) = 0.4 FTE
- A part-time employee (working 40% of a full-time year) spending 60% of time on R&D during half of the year (person is only active for 6 months per year): (0.4 x 0.5 x 0.6) = 0.12 FTE
- 20 full-time employees spending 40% of time on R&D during a year: 20 x (1 x 1 x 0.4) = 8 FTE

NOTE: Please calculate FTEs for all R&D personnel.

9.1 FTE by personnel category

Personnel category	Headcounts (From Q 8.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
(1) RESEARCHERS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL RESEARCHERS (1)						
(2) TECHNICIANS						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL TECHNICIANS (2)						
(3) OTHER SUPPORT STAFF						
Doctoral or equivalent level (ISCED level 8)						
Master's or equivalent level (ISCED level 7)						
Bachelor's or equivalent level (ISCED level 6)						
Short-cycle tertiary education (ISCED level 5)						
All other qualifications, including post-secondary non-tertiary programmes (ISCED 4) and upper secondary programmes (ISCED 3)						
TOTAL OTHER SUPPORT STAFF (3)						

Personnel category	Headcounts (From Q 9.1)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
TOTAL R&D PERSONNEL (1+2+3)						

9.2 FTE by field of science in R&D activity

Field of science	Headcounts (From Q 8.2)			Full-time equivalent (FTE)		
	M	F	Tot	M	F	Tot
(1) RESEARCHERS						
Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL RESEARCHERS						

(2) TECHNICIANS

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL TECHNICIANS						

(3) OTHER SUPPORT STAFF

Natural sciences						
Engineering and technology						
Medical and health sciences						
Agricultural sciences						
Social sciences						
Humanities						
Not specified elsewhere (crosscutting or multidisciplinary)						
TOTAL OTHER SUPPORT STAFF						

9.3 FTE by personnel category and labour cost

Personnel categories	Full Time Equivalent (FTE) (From Q 9.1) (A)	Average annual labour cost per person Local Currency '000 (Excl. VAT) (B)	Calculated labour cost of R&D Local Curr. '000 (Excl. VAT) (A x B)
Total researchers (1)			
Total technicians (2)			
Total other support staff (3)			
TOTAL LABOUR COST (1+2+3)			

Carry subtotal over to Q 10A

PART 3: IN-HOUSE R&D EXPENDITURE

THE DEFINITION AND CALCULATION OF IN-HOUSE R&D EXPENDITURE
OTHER CURRENT EXPENDITURE

Including – but not limited to:

- Direct project costs, project consumables and running costs linked to research, such as materials, fuels and other inputs, including telephone and printing.
- Subsistence and travel expenses.
- Repair and maintenance expenses.
- Payments to outside organizations for use of specialised testing facilities, analytical work, engineering or other specialised services in support of R&D projects carried out by this reporting unit.
- Commission/consultant expenses for research projects carried out by this reporting unit.
- The relevant % of indirect and institutional costs and utility costs, such as rent, space charge, leasing and hiring expenses, furniture, water, electricity and any other overhead costs.
- The relevant % of labour costs of persons providing indirect services such as the head office, human resources, finances, security and maintenance personnel as well as staff of central libraries and IT departments.

Excluding:

- Contract R&D expenses where the research project is carried out elsewhere by others on behalf of this reporting unit.
- Payments for purchases of technical know-how (goodwill).
- Licence fees.
- Depreciation provisions.

- Where current expenses, such as direct project costs and consumables, are used solely for R&D, allocate the full cost of the items.
- If these current expenses are used for more than one activity, include only an estimate of the portion used for R&D.
- Only where such an estimate of the portion used for R&D is not available, such as indirect and utility costs and labour costs of staff providing indirect services, it is advised that respondents apply the percentage time that researchers in the reporting unit spent on R&D to the total of these current expenditures.
- So if the income and expenditure statement shows that the current expenditure for indirect and utility costs and labour costs of staff providing indirect services for the year was say USD 1,700,000 and that researchers on average spent 80% of their time to R&D, then this component of R&D current expenditure may be estimated as 0.8 x USD 1,700,000 = USD 1,360,000.

CAPITAL EXPENDITURE

The full cost of capital expenses must be reported in the year of purchase (do not depreciate).

Including – but not limited to:

- Expenditure on fixed assets used in the R&D projects of this reporting unit
- Acquisition of software, including license fees, expected to be used for more than one year
- Purchase of databases expected to be used for more than one year
- Major repairs, improvements and modifications on land and buildings
- Where a capital item is used solely for R&D, allocate the full cost of the item

- If the capital item is used for more than one activity, include only an estimate of the portion used for R&D. For example, a new piece of equipment that will be used for R&D (included), testing (excluded) and quality control (excluded). For instance, if the intended use of this new equipment for R&D purposes is 40% of the total usage (i.e. the other 60% for other activities), only 40% of the total equipment cost should be considered as relevant R&D expenditure.
- Only where such an estimate of the portion used for R&D is not available, apply the percentage time that researchers in the reporting unit spent on R&D to the cost of the item.

Excluding:

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

10. IN-HOUSE R&D EXPENDITURE

Compile expenditure on IN-HOUSE R&D during the fiscal year ...<YYYY>... Include expenditure funded from all sources: internal and external (contracts and grants) and undertaken by the reporting unit on its own behalf or for other parties.
PLEASE NOTE: Extramural R&D should be reported under Part 5.

Purchase of equipment can, in theory, be classified as either capital or current expenditure. A distinction can therefore be made between "major" and "minor" equipment (to be included in "capital" and "current" expenditures respectively) by establishing some kind of monetary limitation. Please provide us with this limitation as used by your institution.	
Local currency:	

LABOUR COSTS OF R&D

		Local currency '000 excluding VAT
Total cost of R&D personnel (carried over from Question 9.3)	A	

OTHER CURRENT EXPENDITURE ON R&D
(See the definition of current expenditure and how to calculate current expenditure devoted to R&D on the previous page)

		Local currency '000 excluding VAT
Other current expenditure	B	

CAPITAL EXPENDITURE ON R&D
(See the definition of capital expenditure and how to calculate capital expenditure on R&D on the previous page)

		Local currency '000 excluding VAT
Vehicles, plant, machinery and equipment	C	
Land, buildings and other structures	D	
Software	E	

		Local currency '000 excluding VAT
TOTAL R&D EXPENDITURE (A + B + C + D + E)	F	

Carry total R&D expenditure (F) over to Question 11

11. SOURCES OF FUNDS FOR IN-HOUSE R&D

Provide a breakdown of the total R&D expenditure according to the sources of funds listed below (NOTE: Only the proportion of the money actually SPENT is required not the total income per source)
To adapt to national context

Organization	Local currency '000 excluding VAT
Own funds	
Government (includes departments/ministries and grant-making institutes)	
Grants, especially general purpose, including studentships	
Contracts to perform directed R&D	
Businesses	
Contracts to perform R&D (domestic business only)	
Other national sources	
Other not-for-profit organizations (including foundations)	
Individual donations	
Higher education	
Foreign sources	
All foreign funds	

Of above total foreign sources, indicate the % from:

RSA	Rest of Africa	EU	Rest of Europe	China	Rest of Asia	USA/ Canada	Other	Total %

	Local currency '000 excluding VAT
TOTAL R&D EXPENDITURE (to equal Question 10F)	

PART 4: CATEGORIES OF IN-HOUSE R&D EXPENDITURE

12. 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 (optional) b) total IN-HOUSE R&D CURRENT expenditure (labour costs and other current cost) by type of R&D.

Basic research				Column b optional		
• 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 intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		

Applied research						
• 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.	a). Based on total intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		

Experimental development						
• Systematic work using existing knowledge for creating new or improved materials, products, processes or services, or improving substantially those already produced or installed.	a). Based on total intramural expenditure (Percentage)			b). Based on only current expenditure (Percentage)		
TOTAL	1	0	0	1	0	0

13. DETAILED FIELDS OF SCIENCE (FOS)

Classify R&D according to two-digit field of science (FoS) with associated percentage expenditure (see Appendix A)

- The FoS codes are based on recognised academic disciplines and emerging areas of study.

FoS codes				Percentage		FoS codes				Percentage	
FoS						FoS					
FoS						FoS					
FoS						FoS					
FoS						FoS					
FoS						FoS					
FoS						FoS					
						Total				0	0

14. SOCIO-ECONOMIC OBJECTIVES (SEO)

Classify R&D according to socio-economic objective with associated percentage expenditure (see Appendix B)

- The SEO classification provides an indication of the main beneficiary of your R&D activities.

SEO codes				Percentage		SEO codes				Percentage	
SEO						SEO					
SEO						SEO					
SEO						SEO					
SEO						SEO					
SEO						SEO					
SEO						SEO					
						Total				0	0

15. Kindly indicate geographic the location where the reporting unit carried out R&D activities and the percentage of the total R&D expenditure

Specify where R&D activities actually take place, rather than where they are managed /financed from.

Region	Percentage (%)	Ohangwena	
Erongo		Omaheke	
Hardap		Omusati	
Karas		Oshana	
Kavango East		Oshikoto	
Kavango West		Otjozondjupa	
Khomas		Zambezi	
Kunene		TOTAL	100%

.

16. COLLABORATIVE R&D

17a. Does your company collaborate on R&D with persons/organisations outside your own organisation? Tick as appropriate

No	Go to Part 5
Yes	Continue with Question 17b

17b. With whom is R&D conducted in partnerships, alliances or collaboration? Tick as appropriate

Instruction

Note: In the table below a single collaborative R&D project with several partners may be ticked in several places. Collaborative R&D may be intramural or extramural. R&D collaboration can occur without expenditure – please note zero expenditure in such cases.

	Namibia	RSA	Rest of Africa	EU	Rest of Europe	China	Rest of Asia	USA/ Canada	Other
Higher Education Institutions									
Science Councils									
Government Research Institutes									
Members of own organisation/ Affiliate organisations									
Households									
Informal Businesses									
Indigenous Knowledge									
Other Companies (including specialist consultants, business and trade associations)									
Not-for-Profit Organisations									

PART 5: EXTRAMURAL R&D

Extramural R&D refers to:

- Extramural expenditures are the sums a reporting unit 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 (FM § 408).

	Approximate value Local currency '000 (excl. VAT)
18. State details of extramural R&D paid locally	
19. State details of extramural R&D paid abroad	

20. If the amounts stated in Question 18 or 19 are in excess of 1 million units of national currency please indicate the name of the organization(s) that conducted the extramural R&D with the associated expenditure.

State details of extramural R&D paid for **locally.**

Paid to:	Approximate value Local currency '000s (excl. VAT)

State details of extramural R&D paid **abroad.**

Paid to:	Approximate value Local currency '000s (excl. VAT)

THANK YOU FOR YOUR TIME AND EFFORT

APPENDICES
TO THE QUESTIONAIRRES

Appendix A: Two Digit Field of Science Classification (FOS)

1. Natural sciences

1.1 Mathematics

- Pure mathematics, Applied mathematics; Statistics and probability (Includes research on statistical methodologies, but excludes research on applied statistics which should be classified under the relevant field of application (e.g. Economics, Sociology, etc.)

1.2 Computer and information sciences

- Computer sciences, information science and bioinformatics (hardware development to 2.2, social aspect to 5.8);

1.3 Physical sciences

- Atomic, molecular and chemical physics (physics of atoms and molecules including collisions, interaction with radiation; magnetic resonances; Moessbauer effect); Condensed matter physics (including formerly solid state physics, superconductivity); Particles and fields physics; Nuclear physics; Fluids and plasma physics (including surface physics); Optics (including laser optics and quantum optics), Acoustics; Astronomy (including astrophysics, space science);

1.4 Chemical sciences

- Organic chemistry; Inorganic and nuclear chemistry; Physical chemistry, Polymer science, Electrochemistry (dry cells, batteries, fuel cells, corrosion metals, electrolysis); Colloid chemistry; Analytical chemistry;

1.5 Earth and related Environmental sciences

- Geosciences, multidisciplinary; Mineralogy; Palaeontology; Geochemistry and geophysics; Physical geography; Geology; Volcanology; Environmental sciences (social aspects to 5.7);
- Meteorology and atmospheric sciences; climatic research;
- Oceanography, Hydrology, Water resources;

1.6 Biological sciences (Medical to be 3, and Agricultural to be 4)

- Cell biology, Microbiology; Virology; Biochemistry and molecular biology; Biochemical research methods; Mycology; Biophysics;
- Genetics and heredity (medical genetics to be 3); reproductive biology (medical aspects to be 3); developmental biology;
- Plant sciences, botany;
- Zoology, Ornithology, Entomology, Behavioural sciences biology;
- Marine biology, freshwater biology, limnology; Ecology; Biodiversity conservation;
- Biology (theoretical, mathematical, thermal, cryobiology, biological rhythm), Evolutionary biology; other biological topics;

1.7 Other natural sciences

2. Engineering and technology

2.1 Civil engineering

- Civil engineering; Architecture engineering; Construction engineering, Municipal and structural engineering; Transport engineering;

2.2 Electrical engineering, Electronic engineering, Information engineering

- Electrical and electronic engineering; Robotics and automatic control; Automation and control systems; Communication engineering and systems; telecommunications; Computer hardware and architecture;

2.3 Mechanical engineering

- Mechanical engineering; Applied mechanics; Thermodynamics;
- Aerospace engineering;
- Nuclear related engineering; (nuclear physics to be 1.3);
- Audio engineering, reliability analysis;

2.4 Chemical engineering

- Chemical engineering (plants, products); Chemical process engineering;

2.5 Materials engineering

- Materials engineering; Ceramics; Coating and films; Composites (including laminates, reinforced plastics, cermets, combined natural and synthetic fibre fabrics; filled composites); Paper and wood; textiles; including synthetic dyes, colours, fibres; (nanoscale materials to 2.10; biomaterials to be 2.9);

2.6 Medical engineering

- Medical engineering; Medical laboratory technology (including laboratory samples analysis; diagnostic technologies); (Biomaterials to be 2.9 [physical characteristics of living material as related to medical implants, devices, sensors]);

2.7 Environmental engineering

- Environmental and geological engineering, geotechnics; Petroleum engineering, (fuel, oils),Energy and fuels; Remote sensing; Mining and mineral processing; Marine engineering, sea vessels; Ocean engineering;

2.8 Environmental biotechnology

- Environmental biotechnology; Bioremediation, diagnostic biotechnologies (DNA chips and biosensing devices) in environmental management; environmental biotechnology related ethics;

2.9 Industrial biotechnology

- Industrial biotechnology; Bioprocessing technologies (industrial processes relying on biological agents to drive the process) biocatalysis, fermentation; bioproducts (products that are manufactured using biological material as feedstock) biomaterials, bioplastics, biofuels, bioderived bulk and fine chemicals, bio-derived novel materials;

2.10 Nano-technology

- Nano-materials [production and properties];
- Nano-processes [applications on nano-scale]; (biomaterials to be 2.9);

2.11 Other engineering and technologies

- Food and beverages;
- Other engineering and technologies;

3. Medical and Health sciences

3.1 Basic medicine

- Anatomy and morphology (plant science to be 1.6); Human genetics; Immunology; Neurosciences (including psychophysiology); Pharmacology and pharmacy; Medicinal chemistry; Toxicology; Physiology (including cytology); Pathology;

3.2 Clinical medicine

- Andrology; Obstetrics and gynaecology; Paediatrics; Cardiac and Cardiovascular systems; Peripheral vascular disease; Hematology; Respiratory systems; Critical care medicine and Emergency medicine; Anaesthesiology; Orthopaedics; Surgery; Radiology, nuclear medicine and medical imaging; Transplantation; Dentistry, oral surgery and medicine; Dermatology and venereal diseases; Allergy; Rheumatology; Endocrinology and metabolism (including diabetes, hormones); Gastroenterology and hepatology; Urology and nephrology; Oncology; Ophthalmology; Otorhinolaryngology; Psychiatry; Clinical neurology; Geriatrics and gerontology; General and internal medicine; other clinical medicine subjects; Integrative and complementary medicine (alternative practice systems);

3.3 Health sciences

- Health care sciences and services (including hospital administration, health care financing); Health policy and services;
- Nursing; Nutrition, Dietetics;
- Public and environmental health; Tropical medicine; Parasitology; Infectious diseases; epidemiology;
- Occupational health; Sport and fitness sciences;
- Social biomedical sciences (includes family planning, sexual health, psycho-oncology, political and social effects of biomedical research); Medical ethics; Substance abuse;

3.4 Medical biotechnology

- Health-related biotechnology; Technologies involving the manipulation of cells, tissues, organs or the whole organism (assisted reproduction); Technologies involving identifying the functioning of DNA, proteins and enzymes and how they influence the onset of disease and maintenance of well-being (gene-based diagnostics and therapeutic interventions (pharmacogenomics, gene-based therapeutics); Biomaterials (as related to medical implants, devices, sensors); Medical biotechnology related ethics;

3.5 Other medical sciences

- Forensic science
- Other medical sciences

4. Agricultural sciences

4.1 Agriculture, Forestry, and Fisheries

- Agriculture; Forestry; Fishery; Soil science; Horticulture, viticulture; Agronomy, plant breeding and plant protection; (Agricultural biotechnology to be 4.4)

4.2 Animal and Dairy science

- Animal and dairy science; (Animal biotechnology to be 4.4)
- Husbandry; Pets;

4.3 Veterinary science

4.4 Agricultural biotechnology

- Agricultural biotechnology and food biotechnology; GM technology (crops and livestock), livestock cloning, marker assisted selection, diagnostics (DNA chips and biosensing devices for the early/accurate detection of diseases) biomass feedstock production technologies, biopharming; agricultural biotechnology related ethics;

4.5 Other agricultural sciences

5. Social sciences

5.1 Psychology

- Psychology (including human - machine relations);
- Psychology, special (including therapy for learning, speech, hearing, visual and other physical and mental disabilities);

5.2 Economics and Business

- Economics, Econometrics; Industrial relations;
- Business and Management;

5.3 Educational sciences

- Education, general; including training, pedagogy, didactics;
- Education, special (to gifted persons, those with learning disabilities);

5.4 Sociology

- Sociology; Demography; Anthropology, ethnology;
- Social topics (Women's and gender studies; Social issues; Family studies, Social work);

5.5 Law

- Law, criminology, penology;

5.6 Political science

- Political science; public administration; organisation theory;

5.7 Social and economic geography

- Environmental sciences (social aspects); Cultural and economic geography; Urban studies (Planning and development); Transport planning and social aspects of transport (transport engineering to 2.1);

5.8 Media and communications

- Journalism; Information science (social aspects); Library science; Media and socio-cultural communication;

5.9 Other social sciences

- Social sciences, interdisciplinary;
- Other social sciences;

6. Humanities

6.1 History and Archaeology

- History (history of science and technology to be 6.3, history of specific sciences to be under the respective headings); Archaeology;

6.2 Languages and Literature

- General language studies; Specific languages; General literature studies; Literary theory; Specific literatures; Linguistics;

6.3 Philosophy, Ethics and Religion

- Philosophy, History and philosophy of science and technology;
- Ethics (except ethics related to specific subfields); Theology; Religious studies;

6.4 Arts (arts, history of arts, performing arts, music)

- Arts, Art history; Architectural design; Performing arts studies (Musicology, Theater science, Dramaturgy); Folklore studies;
- Studies on Film, Radio and Television;

6.5 Other humanities

Source: OECD (2007)

Appendix B: One Digit Socio-Economic Objective Classification

1. Exploration and Exploitation of the Earth.
2. Environment.
3. Exploration and Exploitation of Space.
4. Transport, telecommunication and other infrastructures.
5. Energy.
6. Industrial production and technology.
7. Health.
8. Agriculture.
9. Education.
10. Culture, recreation, religion and mass media.
11. Political and social systems, structures and processes.
12. General advancement of knowledge.
13. Defence.

Source: Eurostat (2008)

Appendix C: International Standard Industrial Classification of All Economic Activities (ISIC)

ISIC Rev. 4

A - Agriculture, forestry and fishing
01 - Crop and animal production, hunting and related service activities
02 - Forestry and logging
03 - Fishing and aquaculture

B - Mining and quarrying
05 - Mining of coal and lignite
06 - Extraction of crude petroleum and natural gas
07 - Mining of metal ores
08 - Other mining and quarrying
09 - Mining support service activities

C - Manufacturing
10 - Manufacture of food products
11 - Manufacture of beverages
12 - Manufacture of tobacco products
13 - Manufacture of textiles
14 - Manufacture of wearing apparel
15 - Manufacture of leather and related products
16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17 - Manufacture of paper and paper products
18 - Printing and reproduction of recorded media
19 - Manufacture of coke and refined petroleum products
20 - Manufacture of chemicals and chemical products
21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations
22 - Manufacture of rubber and plastics products
23 - Manufacture of other non-metallic mineral products
24 - Manufacture of basic metals
25 - Manufacture of fabricated metal products, except machinery and equipment
26 - Manufacture of computer, electronic and optical products
27 - Manufacture of electrical equipment
28 - Manufacture of machinery and equipment n.e.c.
29 - Manufacture of motor vehicles, trailers and semi-trailers
30 - Manufacture of other transport equipment
31 - Manufacture of furniture
32 - Other manufacturing
33 - Repair and installation of machinery and equipment

D - Electricity, gas, steam and air conditioning supply
35 - Electricity, gas, steam and air conditioning supply
E - Water supply; sewerage, waste management and remediation activities
36 - Water collection, treatment and supply
37 - Sewerage
38 - Waste collection, treatment and disposal activities; materials recovery
39 - Remediation activities and other waste management services

F - Construction
41 - Construction of buildings
42 - Civil engineering
43 - Specialized construction activities

G - Wholesale and retail trade; repair of motor vehicles and motorcycles
45 - Wholesale and retail trade and repair of motor vehicles and motorcycles
46 - Wholesale trade, except of motor vehicles and motorcycles
47 - Retail trade, except of motor vehicles and motorcycles

H - Transportation and storage
49 - Land transport and transport via pipelines
50 - Water transport
51 - Air transport
52 - Warehousing and support activities for transportation
53 - Postal and courier activities

I - Accommodation and food service activities
55 - Accommodation
56 - Food and beverage service activities

J - Information and communication
58 - Publishing activities
59 - Motion picture, video and television programme production, sound recording and music publishing activities
60 - Programming and broadcasting activities
61 - Telecommunications
62 - Computer programming, consultancy and related activities
63 - Information service activities

K - Financial and insurance activities
64 - Financial service activities, except insurance and pension funding
65 - Insurance, reinsurance and pension funding, except compulsory social security
66 - Activities auxiliary to financial service and insurance activities

L - Real estate activities
68 - Real estate activities

M - Professional, scientific and technical activities
69 - Legal and accounting activities
70 - Activities of head offices; management consultancy activities
71 - Architectural and engineering activities; technical testing and analysis
72 - Scientific research and development
73 - Advertising and market research
74 - Other professional, scientific and technical activities
75 - Veterinary activities

N - Administrative and support service activities
77 - Rental and leasing activities
78 - Employment activities
79 - Travel agency, tour operator, reservation service and related activities
80 - Security and investigation activities
81 - Services to buildings and landscape activities
82 - Office administrative, office support and other business support activities

O - Public administration and defence; compulsory social security
84 - Public administration and defence; compulsory social security

P - Education
85 - Education

Q - Human health and social work activities
86 - Human health activities
87 - Residential care activities
88 - Social work activities without accommodation

R - Arts, entertainment and recreation

90 - Creative, arts and entertainment activities
91 - Libraries, archives, museums and other cultural activities
92 - Gambling and betting activities
93 - Sports activities and amusement and recreation activities

S - Other service activities

94 - Activities of membership organizations
95 - Repair of computers and personal and household goods
96 - Other personal service activities

T - Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

97 - Activities of households as employers of domestic personnel
98 - Undifferentiated goods- and services-producing activities of private households for own use

U - Activities of extraterritorial organizations and bodies

99 - Activities of extraterritorial organizations and bodies

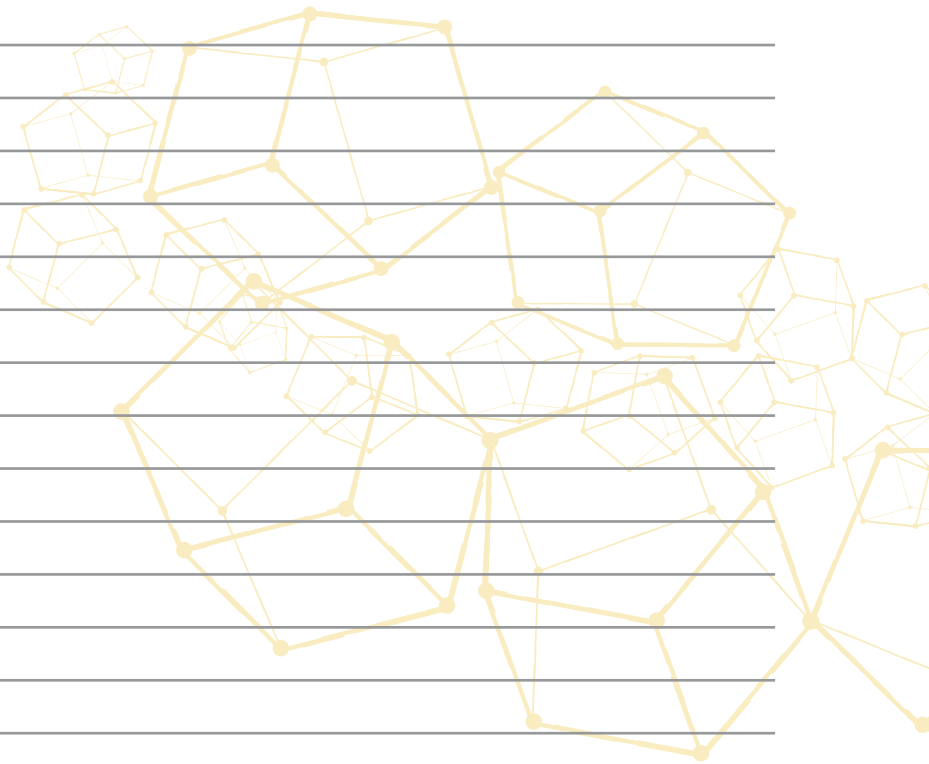
Source: http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27.

1. the 4 questionnaires as attached as separate documents

2. The appendices as attached as separate documents

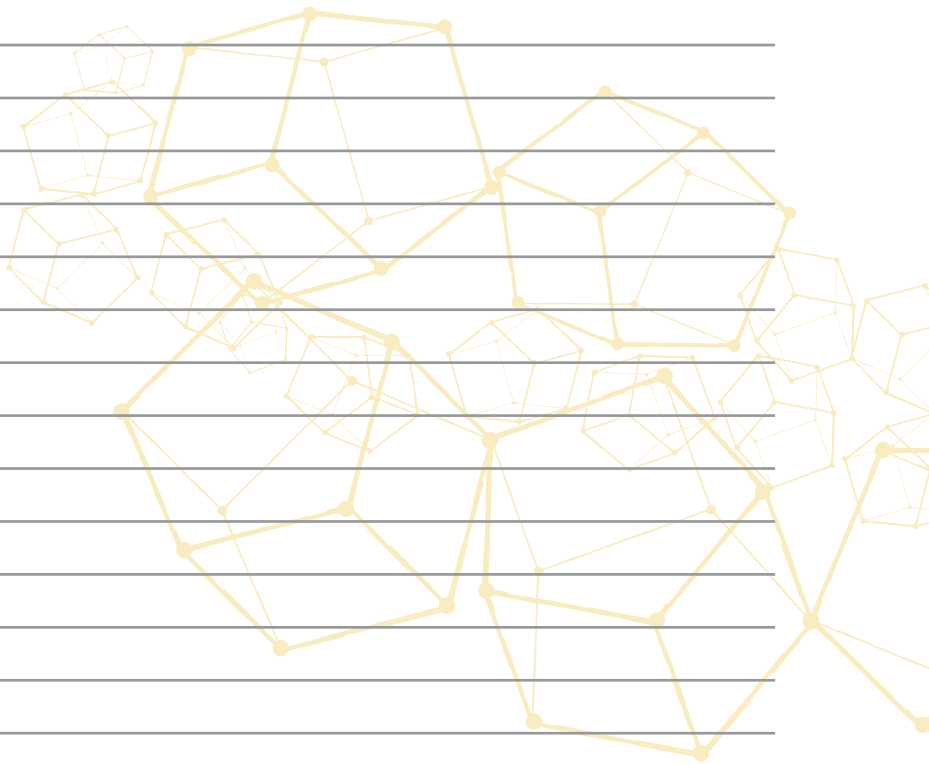
Update the table of contents to reflect the 4 questionnaires and the appendices

Notes



Notes

Notes



Notes

National Commission on Research, Science and Technology (NCRST)

Head Office

Cnr Louis Raymond and Grant
Webster Street | Olympia | Windhoek |
Namibia
Tel: +264 61 431 7000
Private Bag 13253 | Windhoek | Namibia

Cyber Space

Email: info@ncrst.na
Website: https://ncrst.na
Facebook: facebook.com/ncrst.na
Twitter: @NCRST_Namibia
LinkedIn: National commission on research, Science and Technology (NCRST)