

## TERMS OF REFERENCE FOR CONCEPTS AND TERMINOLOGIES

### 1. MAPPING OF RESEARCH INFRASTRUCTURE (FACILITIES & EQUIPMENT) IN NAMIBIA

The National Commission on Research, Science and Technology (NCRST) was established in terms of Section 4 of Research, Science and Technology Act, 2004 (Act No. 23 of 2004) (RST Act) with a primary role of promoting, coordinating, monitoring, and developing Research, Science and Technology in Namibia. The NCRST is a public enterprise established in term Public Enterprises Governance Act, 2019 (Act No. 1 of 2019). The institution is guided by the Revised National Science, Technology, and Innovation Policy (2020-2030) and other Science, Technology, and Innovation (STI) legal frameworks as well as the Integrated Strategic Business Plan FY2021/22 – FY2025/26.

In the context of the ongoing nation-wide survey to collect updated information on the status of the research infrastructure in Namibia, the concept of research Infrastructure means facilities, resources or related services that are used or needed by the scientific community to conduct research in their respective fields and covers major scientific equipment or sets of instruments; knowledge-based resources such as collections, archives, or structures for scientific information; enabling ICT based infrastructures, or any other entity of a unique nature essential to achieve excellence in research.

These research infrastructures can be single-sited or distributed or an e-infrastructure and can be part of a national or international network of facilities, or of interconnected scientific instrument networks.

Below are the definitions of what research infrastructures may mean:

- **e-Infrastructure** (electronic infrastructure) encompasses high-performance computing resources, grid technology, advanced solutions for data storage and management, and high-speed networks.
- **Scientific databases** are structured, systematized, digitized data such as private or public registries, time series, survey data, digital photographs, text files and audio files from which information can be retrieved through the use of search criteria in a data system.
- **Scientific collections** comprise compilations of physical objects of a certain type, systematized and digitized for scientific purposes. Examples include bio-banks and collections of fossils, species specimens and objects.
- **Scientific equipment** comprises everything from basic equipment to which access is essential for many research institutions, to advanced equipment for specialized research purposes.
- **Large-scale research facilities** comprise large-scale laboratories and research equipment installations.
- **Office Space / Premises** - refers to dedicated physical locations equipped with amenities tailored to research needs and resources to facilitate productive scientific endeavours. These spaces provide researchers with a conducive environment for collaboration, experimentation, data analysis, and knowledge exchange.

## 2. ALIGNMENT:

In a bid to provide clear and standardised definition of research infrastructure the NCRST aligns with recognized frameworks such as the [South African Research Infrastructure Roadmap](#) and [ESFRI Roadmap](#), providing a comprehensive guide for categorizing infrastructure and equipment based on types, categories, functional purpose, sizes, and cost considerations.

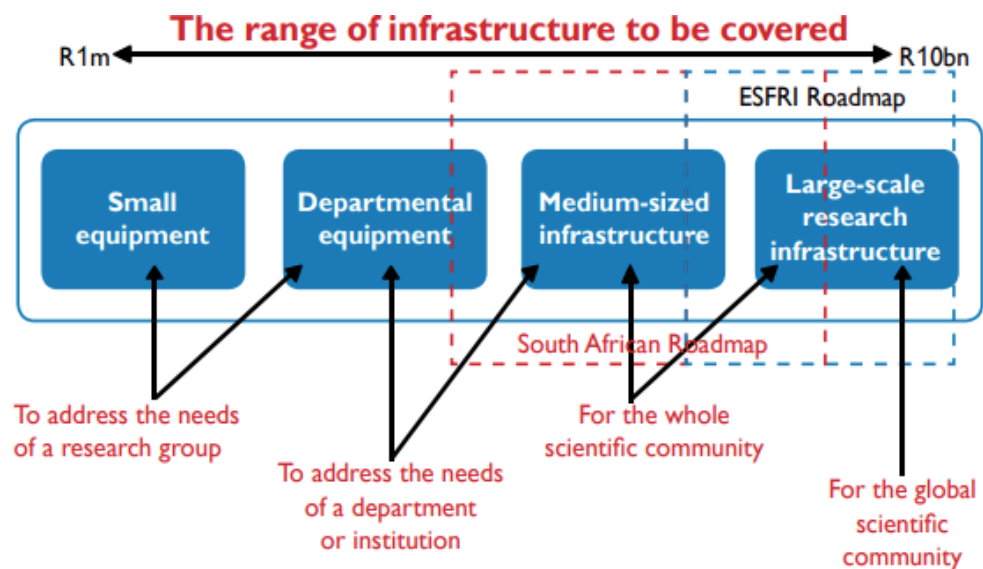


Figure 1: Range of research infrastructures for SARIR

## 3. KEY DEFINITIONS OF TERMINOLOGIES AND CONCEPTS:

**Major Scientific Equipment:** typically refers to the essential key instruments, tools, and devices, used by researchers to carry out scientific investigations and experiments. These pieces of equipment often require substantial investment, specialized knowledge, and are critical for gathering accurate and reliable data. Major research equipment can vary depending on the field of study.

**National Systems of Innovation (NSI):** may be defined as a dynamic and integrated network consisting of various institutions and actors across the public and private sectors within a country. These entities, including universities, research institutes, industries, government agencies, and other stakeholders, collaborate and interact to actively initiate, import, adapt, and disseminate new technologies and knowledge.

**Research Infrastructure:** refers to facilities, resources, and related services used by the scientific community for Conducting cutting-edge research; Knowledge transmission; Knowledge exchange; and Knowledge preservation. May include laboratories or its equipment, scientific equipment, specialised facilities, high-end infrastructure, global infrastructures, and cyber-infrastructure.

**Research, Science, Technology, and Innovation Infrastructure:** comprises of the major scientific equipment, facilities and services which support research across the Science, Technology, and Innovation system and which maintain the capacity of researchers to undertake excellent research and deliver innovation outcomes. They are key instruments in bringing together a wide diversity of stakeholders to unravel complex scientific questions and look for solutions to many of the challenges society is facing today.

**Research Facility:** is a specialized institution equipped with resources, infrastructure, and cutting-edge equipment, dedicated to conducting scientific or technological research in specific fields. These establishments, operated by universities, government agencies, private companies, or non-profit organizations, provide an environment conducive to advancing knowledge, fostering innovation, and facilitating multidisciplinary studies through laboratories, experimental areas, offices, and support services.

Type of Facilities	Definition / Description
<b>Ministerial / Departmental Facilities (OMAs)</b>	<i>The type of equipment which is used by one or several researchers and students within the department and funded by the institution and or the researcher from his/her research grant.</i>
<b>Institutional Facilities</b>	<i>Institutional research infrastructure utilized by researchers from several sectors, disciplines, and departments.</i>
<b>National Facilities</b>	<i>This includes expensive research equipment which is normally beyond the means of a single or cluster of institutions.</i>
<b>International Facilities</b>	<i>Mega-science facilities located in Namibia by virtue of e.g., geographical advantage in which Namibia has acquired a share on behalf of local users. An example of this facilities is the High Energy Stereoscopic System (HESS) in Namibia</i>
<b>Foundation Facilities</b>	<p><i>Foundation facilities are those which constitute the backbone of the research infrastructure and without which all or most of the other categories of the research equipment infrastructure cannot function optimally.</i></p> <p><i>Examples of foundation facilities in research infrastructure include centralized data repositories, core laboratories equipped with advanced instrumentation such as mass spectrometers or electron microscopes, specialized experimental hubs for controlled studies, computational research clusters for data analysis, and collaborative workspaces fostering interdisciplinary research. These facilities collectively support and enhance the functionality of diverse research equipment categories, ensuring a comprehensive and efficient research environment.</i></p>