



# NIGERIAN INSTITUTE OF MEDICAL RESEARCH

# RIND

## RESEARCH INNOVATION AND PRODUCT DEVELOPMENT UNIT

### POLICY 2022 DOCUMENT





# *RESEARCH INNOVATION AND PRODUCT DEVELOPMENT UNIT*

# *POLICY 2022*

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## Vision

To be an institution of excellence in basic, applied and operational research for the promotion of national health and development in Nigeria.

## Core Value

- Honesty
- Integrity
- Leadership
- Excellence
- Respect
- Fairness
- Dignity
- Teamwork
- Innovation
- Relevance
- Hard work
- Fair Reward and Recognition
- Accountability and Transparency
- Communication: Internal and External
- Equity

## Mission

The mandate of the Institute under the enabling Act of 1977, stipulates that NIMR shall conduct research into health problems in the country essentially in the following areas:

- Communicable diseases of public health importance in the country
- Non-Communicable diseases prevalent in the country
- Basic, applied and operational research for the prevention and control of diseases endemic in the country in cooperation with the federal and state ministries of health
- Develop human and infrastructural capacities for clinical and biomedical research in collaboration with Medical Schools, Universities and other health-related institutions, in and outside Nigeria
- Disseminate the results of health research in the country through training courses, scientific publications, conferences, workshops and other communication channels to the Federal and States Ministries of Health, and relevant stakeholders in the public and private sectors on national health and development in Nigeria.





## FOREWARD



NIMR as an institution is determined to achieve a proud record of innovative research and inventions of life-saving biomedical products and equipment. The strategy is to build on our research strength and knowledge base to shore up our commitments to national health development in Nigeria. We believe that forging collaborations with external organizations, and especially the private sector will yield more innovation funding to further maximize our research prowess to develop competitive and high-value medical products. A policy document will serve as a guide and Launchpad to set the NIMR-RIND initiative in the top motion and the right direction.

The Nigerian Institute of Medical Research -Research Innovation and Product Development (NIMR-RIND) policy document provides the framework for ensuring competitive and innovative research principles. It is a guide to qualitative and quantitative improvements in research performance and output that will continue to earn NIMR her rightful position as a leader in all health research and innovative technologies. NIMR is committed to maintaining a leadership role among health research institutes nationally and internationally. The Institute is also unswerving in engaging in research activities to create and advance knowledge and research discoveries that will improve the quality of life in line with the Institute's mandate, vision and mission.

Product development involves a complex and dynamic process, which requires a strategic focus to navigate the interplay between the human, capital and material resources needed to overcome innovation barriers. It is against this background that this policy outlines the guiding principles for developing, managing, and supporting research and innovations in NIMR. This Policy aligns with the NIMR Strategic Plan document and other relevant research and ethics policy of NIMR.



**Prof Babatunde Lawal Salako,**

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**Director-General/CEO**

## ACKNOWLEDGMENTS

This policy document summaries the guiding principles concerning managing, supporting and developing research for all those involved in research and innovation in NIMR. I hereby express my sincere gratitude to the Almighty God for His mercy, love, inspiration, grace and wisdom availed to us throughout the writing of this first NIMR-RIND policy. To Him alone be all glory for the successful completion of this work.

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I am extremely grateful to the editors of this policy document for their expertise and timely review. The graphic designer is not left out of the great work done in portraying our thoughts in design and beauty.

Finally, to NIMR management for believing in me and for the financial support all through the journey of this noble course to the realization of the overall goal.

Yours sincerely,



**Professor Nkiruka Nonyelum Odunukwe** *BM.ChB, FWACP, MNIM, MD,*  
Director of Research CSD & Head, RIND

## APPROVAL

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## LIST OF ABBREVIATIONS AND ACRONYMS

BCVL	Bio-repository Clinical Virology Laboratory
CHAZVY	Centre for Human and Zoonotic Virology
CL	Central Laboratory
CMUL	Community Medicine University of Lagos
DG	(Director-General)
GDP	Gross Domestic Products
M&E	Monitoring & Evaluation
MOU	Memorandum of Understanding
NCDC	Nigerian Centre for Disease Control
NGO	NIMR Grant Office
NIMR	Nigerian Institute of Medical Research
NOTAP	National Office for Technology Acquisition and Promotion
NRF	NIMR Research Foundation
NRIF	National Research & Innovation Fund
OAU	Obafemi Awolowo University
PMD	Project Manager - Diagnostics Programme
PME	Project Manager - Equipment production
RAC	RIND Advisory Committee
RD	RIND Director
RIND	Research Innovation and Product Development
SOP	Standard Operating Procedure
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TOR	Terms of Reference
TT&C	Technology Transfer / Commercialisation Unit
TWG	Technical Working Group
UCH	University College Hospital
URL	Uniform Resource Locators
WHA	World Health Assembly



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## **SECTION ONE      INTRODUCTION AND ESTABLISHMENT OF NIMR-RIND**

### **1.1      Introduction**

Technological innovation has continued to transform healthcare and increase the possibilities of improving diagnostic treatment options that impact the quality of life and life expectancy. Globally more focus is on research that transforms into tangible products like vaccines, drugs, technologies and machines that can be applied to improving the wellbeing of the people. NIMR as a leading national medical research institute is also positioning itself to be at the forefront of research innovation in Nigeria. The first in-country-Yellow Fever Vaccine was produced in NIMR many decades back. To improve translational research and the innovative capacity of the institute, the Research Innovation and Product Development Unit (RIND) of NIMR was conceived.

### **1.2      Establishment of NIMR RIND Unit**

The NIMR Research Innovation and Product Development Unit (RIND) was established in 2017 through a committee under the chairmanship of Dr N. N. Odunukwe, Director of Research, Clinical Sciences Department. Other committee members were drawn from heads of the following NIMR Committees and Units: Scientific Committee, Annual Conference Committee, Seminar Committee, Grant Sub-Unit/ Monitoring & Evaluation (M&E) Unit, and NIMR Consult Unit.

RIND started operations as a Unit to change the narrative of over-dependence on the importation of medical and diagnostic products into the country. The main purpose was to identify gaps in treatment and diagnostics needs that should be filled with innovative research products. And in addition, advance the course of translational medical research, and the production of NIMR biotechnical diagnostic products for improved health services. In its short time of existence, NIMR-RIND developed several medical products, and some have been patented.

RIND Unit officially took off in 2019 and is progressively growing to be a Centre to execute the following objectives: -

- To create the enabling environment to nurture innovative ideas.
- To liaise with NIMR Community towards securing viable translational research ideas and findings as patentable/ registrable products.
- To articulate processes that will engender commercialization of NIMR products.
- To implement frameworks for sharing of benefits of research commercialization.

To provide support for applications by innovators and inventors for the protection of the property rights of innovations/inventions.

To identify innovations and inventions that are of high potential for commercialization, and develop operational prototypes of such innovations and inventions in the national technology parks.

### **1.3 Terms of Reference (TOR) For the Committee**

1. To develop the research strategy of the institute within the framework approved by management and set out by the institute's strategic plan. The committee shall keep under review the research activities of the institute to encourage and facilitate research of the highest quality and also the quality, productivity, relevance and viability of the institute's research projects against international standards.
2. To review research activities, management and monitoring framework to ensure they are comprehensive and fit for purpose, and secure means for the development of research in the institute.
3. To advise the institute on major investment decisions in line with its strategic plan and policy, and to oversee and promote the development and integration of the institute's knowledge exchange and impact strategy with its commitment to research excellence.
4. To review the scope and purpose of the institute's research groups/ committees and ensure that they are comprehensive and complete and that accountability of different responsibilities is clear and concise.
5. To report as appropriate to management on routine grants and monitoring performance and alert management of anything posing major risks.
6. Review the assessment of all new proposals for research or for extensions of existing research projects which involves the commitments of the institute's funds and resources, other than what is personal to individual research staff.
7. Make recommendations to management on proposed funding applications by members of staff to outside bodies for research funds for which if granted, the institute would be held accountable.

## **2.2 Functions and Responsibilities of Each Office :**

### **A. The Director-General (DG):**

- i. DG shall present the activities of RIND to the most appropriate government authorities such as the Federal Ministry of Health and the Federal Ministry of Science and Technology for support and partnership.
- ii. DG shall promote increased research excellence and innovation potentials through greater access to external sources of knowledge.
- iii. DG shall direct heads of departments in NIMR to support the activities of RIND.
- iv. DG shall sign and seal the MOUs with intending partners, entrepreneurs and venture capitalists in events of product commercialisation.
- v. DG shall approve all fund disbursement and expenditure of RIND.

### **B. RIND Director (RD)**

- i. RIND Director is directly responsible to the DG for defining the RIND Policy, coordinating its implementation across the relevant RIND entities and ensuring compliance with the related regulatory and institutional requirements. As research and innovation are powerful drivers of improving national economic growth, RD must be a Director of Research and will take direct responsibility to ensure that the Centre succeeds by connecting RIND both locally and internationally with relevant collaborators.
- ii. RD shall develop the RIND vision and mission statements, and ensure that such statements are communicated to and understood by all RIND staff.
- iii. The RIND Director shall take full responsibility for the affairs of the Centre and report directly to the Director-General on the running and administration of the Centre.
- iv. The RD shall ensure the RIND policy document is revised and updated regularly with the emergence of issues that were not expected in the previous versions.
- v. The RD shall ensure that such a policy provides good governance with the legal framework for the conduct and management of RIND activities.
- vi. The RD in addition shall be a Professor/Staff/Research Fellow of the institute with an obvious interest in innovative research activities.

### **C. Technology Transfer / Commercialisation Unit (TT&C):**

- i. This unit shall move results stemming from scientific and technological research to the marketplace and wider society along with associated skills and procedures.

- ii. Shall commercialize research discoveries and technology developed at NIMR. This unit shall be headed by a Senior Researcher/Biomedical Engineer who has an interest in innovative research and has adequate knowledge of TT&C.

**D. Technical Working Group (TWG):**

- i. Shall work in collaboration with the project managers to validate the new product, and produce and publish articles from the validation results.
- ii. Shall organize workshops/seminars/conferences that aim to expose the researcher to aspects linked to negotiations, commercialization, intellectual property, and technology transfer.

**E. Project Manager -Diagnostics (PMD):**

- i. Shall ensure the day-to-day running of the diagnostic innovative projects.
- ii. Shall bring to the fore the activities of the innovators through the process of finalisation and validation with publications.
- iii. Shall submit innovative diagnostic research products of the Centre to the TWG of RIND for validation. The PMD must be a research fellow with a keen interest in innovative research, with some knowledge of diagnostic production.

**F. Project Manager - Equipment production (PME)**

- i. Shall ensure the day-to-day running of the equipment production and innovative projects.
- ii. Shall ensure the activities of the program in conjunction with the innovator through the process of finalisation and validation with publications.
- iii. Shall submit innovative equipment research products of the Centre to the TWG of RIND for validation. The PME must be a Research Fellow/ Biomedical Engineer with a keen interest in innovative research and some knowledge of equipment production. He/she must work in harmony with all RIND staff and have close supervision of the fabrication workshop.

**G. RIND Advisory Committee (RAC):**

- i. Shall ensure adherence to the terms of reference establishing the Committee.
- ii. Shall sit to approve products and services of the Centre.
- iii. Shall ensure that RIND activities are in line with the strategic plan of the Institute.
- iv. Shall work together with RD to ensure that the Centre succeeds by connecting RIND both locally and internationally to relevant collaborators/investors.
- v. The committee would ensure a constant review of the RIND policy document.



#### **H. NIMR Research Foundation (NRF)**

- i. Shall partner with RIND to fund innovative ideas identified by RIND.
- ii. Shall facilitate fundraising activities to support innovative research in areas of national needs and priorities.

#### **I. National Research & Innovation Fund (NRIF)**

- i. NIMR -RIND shall collaborate with NRIF on strategies for funding innovative research projects and work closely with the NIMR Grant Unit.

#### **J. NIMR Grant Office (NGO)**

- i. NIMR Grant Unit shall give support to RIND for fund mobilization and accountability
- ii. Shall also connect with NRIF to fund RIND

#### **K. Research Departments**

- i. Research Departments will collaborate with RIND, to bring about a better economic turnaround for NIMR.

#### **L. NIMR Legal Unit /Administrative & other Support Units**

- i. NIMR legal Unit shall advise and render legal support in preparing of MOUs and any contractual agreement with partners, private or governmental.
- ii. The administrative and other support d shall provide staff to perform support services to RIND. (Library & ICT, Secretary, Accountant, Clerks, Drivers, etc.). They shall give secretarial and allied services to the Centre.

#### **M. Consultancy, Marketing and Sales**

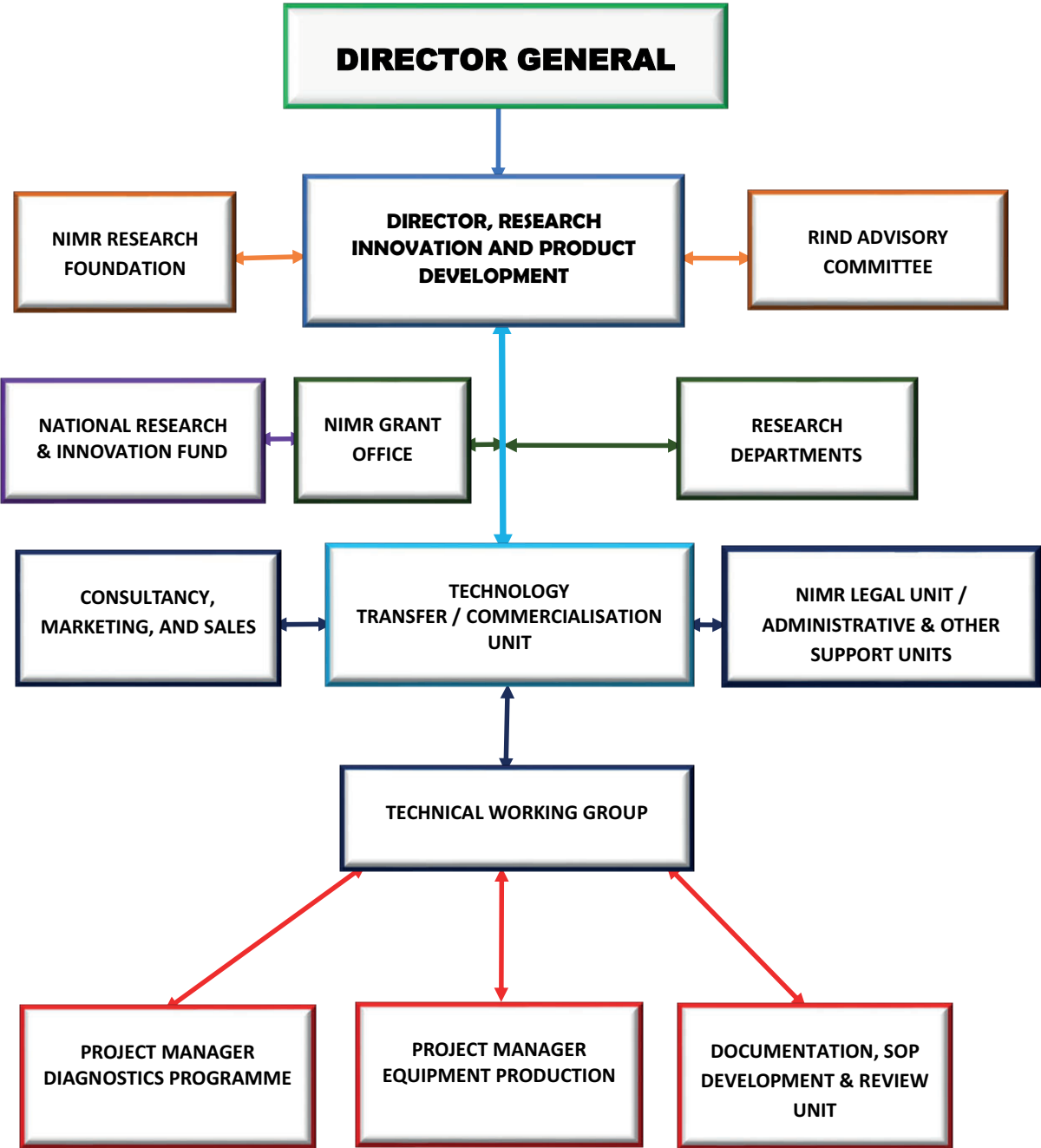
- i. Shall liaise with TT&C with branding, public relations and marketing of RIND products.
- ii. Shall create strategic plans aimed at strengthening consultation services to various government departments, industry and professional bodies.

#### **N. Documentation, SOP Development & Review Unit**

- i. Shall, together with Product Managers, generate SOPs & Manuals on all products and services.
- ii. Shall ensure that all necessary documents are up-to-date.
- iii. Shall work in synergy with the NIMR Library & ICT department to manage and secure RIND's data.

SECTION TWO: STRUCTURE, FUNCTIONS AND RESPONSIBILITIES

2.1 RIND Organisational Chart



## **SECTION THREE: NIMR RIND POLICY THRUST**

### **3.1 RIND Policy Vision Statement**

NIMR RIND policy is to inspire competitiveness and financial advancement, as well as enhance increased participation and performance of the NIMR research community in international research programmes and collaborations.

#### **3.1.1 RIND Policy Vision:**

To create a supportive environment for researchers to empower their engagements in transformative discoveries/innovations to generate new knowledge, and support inventive actions to profit NIMR, the nation, and the global community.

#### **3.1.2 RIND Policy Mission**

The RIND Policy Mission is to provide a template with comprehensive, solution-oriented activities and infrastructure to support innovative research, dissemination and translation of discoveries to a world-class standard.

### **3.2 RIND Policy General Objective**

Serves as a framework for stakeholders, management, and research staff on their roles and responsibilities in the research and innovation acculturation process in NIMR.

### **3.3 Specific RIND Policy Objectives**

RIND's specific objectives are to:

- a) Authorise and cultivate creative and innovative research.
- b) Engender research collaboration between disciplines and various fields locally and abroad.
- c) Strengthen and support teamwork and collaboration between institute and universities, industries, and society.
- d) Input dynamism in revenue generation from innovative research.

### **3.4 RIND Policy Statement**

This RIND policy is to guide strong innovation and inventions required to contribute to the growth and development of the institutional and national economy. Research and innovations are the bedrock for improving the economic growth of the country by contributing to its gross domestic

products (GDP). The Research and Innovation Policy of the Nigerian Institute of Medical Research is intended to serve as a guiding document for management, other research staff and all other stakeholders in and outside NIMR. It is expected to guide the roles and responsibilities of all actors and stakeholders in research and innovation activities in the institute.

This RIND Policy, therefore, provides the required direction to ensure the performance and continuous improvement of the RIND Unit, potential inventors and innovators in the institute. The policy also emphasizes creating an enabling platform and framework that will strengthen the capacities of researchers and inventors in the institute.

The Policy also gives the reader useful information on the direction of RIND projects and programmes. In this policy, a closer appraisal of the roles of stakeholders is provided based on their recognized importance in RIND projects and programmes.

This policy and its successful implementation, therefore, is expected to ensure that stakeholders in RIND (including the private sectors) will closely collaborate with relevant health and training authorities at the Federal, State, and Local Government levels in implementing of this policy.

### **3.5 Scope**

This policy covers all procedures associated with the implementation and management of research innovation, research output, scholarly activities, joint ventures (collaboration), consultation, and commercialization activities at the Nigerian Institute of Medical Research.

In line with the vision of the Nigerian Institute of Medical Research to become a leading Institute in research, innovation, publication and teaching, the Institute must take a strong approach to develop a culture of competitive research and innovation among staff.

### **3.6 RIND Policy Mission Strategy**

- a) There shall be a multidisciplinary competitive and innovative culture of research and innovations in priority areas and relevant globally among staff.
- b) Promote research excellence and innovation potential through greater access to external sources of knowledge and collaborations.
- c) There shall be a global collaboration and innovation network that can promote and utilize new knowledge and technologies which will enhance global competitive research and innovations conducted to compete for international research funds.

## **4.2 Regulatory Framework**

The Nigerian Health Research policy has set research product development involving technologies, pharmaceuticals (diagnostics, vaccines, drugs), procedures and medical/rehabilitation devices as one of its health research priorities. Some principles of good practice in the management and conduct of health care research in NIMR have been set in the Institute's current strategic plan.

These principles protect and promote the interests of patients, service users and the public in health research through ethical conduct and proportionate, assurance-based management of health research. In addition, these principles support and facilitate high-quality research that assures the confidence of patients, service users and other key stakeholders in research.

## **4.3 Quality Research Culture**

Some of the principles and requirements set out in the RIND policy framework are straightforward, however many require judgement and interpretation. It is therefore essential to understand the standards, principles and requirements and apply them correctly.

Some of the key elements of a quality research culture are:

- Respect for participants' dignity, rights, safety and well-being.
- Valuing the diversity within society.
- Personal and scientific integrity.
- Leadership.
- Honesty.
- Accountability.
- Clear and supportive management.
- Openness.

## **4.4 Research & Development**

The current difficulties in the global health industry necessitate countries to provide a consistent supply of critical resources. More importantly, is the need to ensure access to these resources in a self-sufficient process. RIND will provide funds and an enabling environment for scientists to conduct research, and develop diagnostics, drugs, vaccines, and other interventions best suited for use in Nigeria, sub-Saharan Africa and the world. Thus, we will prioritise many conditions prevalent in Nigeria and sub-Saharan Africa as well as emerging and re-emerging diseases.

- d) RIND shall expose staff to innovative research culture in developed nations to promote good service delivery and encourage multidisciplinary and globally competitive products.
- e) RIND shall attract excellent and seasoned local/foreign researchers, inventors and innovators to collaborate with the Institute to promote innovation and product development.
- f) Research output and performance indicators for the research shall include publications, intellectual property rights, research reports, research funds and supervision
- g) RIND shall promote intellectual property rights that allow the owner of the Intellectual Property (NIMR) to exercise exclusive control over the exploitation of such rights usually associated with commercial gains.
- h) RIND shall coordinate research and innovations in line with institutional and national priorities.
- i) RIND shall explore new strategies and alternatives for innovations and collaborations.
- j) RIND shall network with the Public - Private sector (PPC) to conduct research, as well as innovation, consultation and commercialisation.
- k) RIND shall identify ways and means by which innovations can be scaled up and sustained.

## **SECTION FOUR POLICY COMPONENTS**

### **4.1 Leadership & Governance**

The Nigerian Institute of Medical Research is a reputable point of reference in basic, applied and operational research for the promotion of national health and development in Nigeria. It is committed to deploying research and development to address public health needs in the country. It is also committed to supporting medical research activities to create and advance knowledge and improve the quality of life through the discovery, dissemination and use of research. By so doing, the management is promoting the transfer of research ideas into end products of value for national health development. Therefore, the Institute has established the Research Innovation and Product Development (RIND) unit to drive this process.

RIND will provide the enabling environment, resources, and strategies to respond and adapt to the process of innovation. It will also provide the transformational leadership required to entrench the culture of research, innovations, and technology transfer. This will be achieved through the implementation of accountability and good governance.



#### **4.5 Intellectual Property Rights**

In Nigeria, several laws have a bearing on the protection and administration of the different rights that make up intellectual property. The intellectual property connotes all forms of copyrights: inventions in all fields of human endeavor; Industrial designs; and trademarks, which include service marks and brand names. The enforcement of intellectual property rights in Nigeria includes various measures by which intellectual property rights are protected under the law. Essentially, there are four main types or forms of intellectual property common in Nigeria- they are trademarks, copyrights, patents and industrial designs. RIND is governed by the Intellectual Property Rights as operated in Nigeria as well as Treaties of the World Intellectual Property Organization ratified by Nigeria.

#### **4.6 Technology Transfer & Diffusion**

Technology transfer within the health setting is the process of moving medical technologies from creation to their application in clinical practice. This refers to the process of conveying results stemming from scientific and technological research to the marketplace and the wider society, along with associated skills, and procedures and is as such an intrinsic part of the technological innovation process. In contrast, diffusion is the process by which the adoption of new technologies is spread widely within or outside the organizations. Invariably, the innovations are adopted by a population depending on the product involved at a time, RIND adopts the most suitable option.

#### **4.7 Standardization & Quality Assurance**

RIND shall ensure that all innovative products meet relevant international and national standards, including those set by the World Health Organization. We implement relevant ISO standards in our research development and production facilities, to ensure products are of the highest possible standard to meet acceptability and uptake worldwide. RIND facilitates external verification of products to produce independent evaluations that engender global acceptability.

#### **4.8 Commercialization of RIND Products**

Strategies in the commercialization of RIND products include the following:

- a. Encouraging staff to improve international relations such as undertaking their sabbaticals abroad.
- b. Commercialising research discoveries and technology developed at NIMR.
- c. Organising workshops/seminars/conferences to expose researchers to aspects linked to negotiations, commercialisation, intellectual property, and technology transfer.
- d. Promoting interaction with industries and professional bodies.

### **5.3 Networks of Laboratories, Technologies and Digital Infrastructures**

- i. Technology hubs.
- ii. Extramural laboratories, technologies, digital infrastructures (e.g. CCHub etc.)

### **5.4 Administrative supports for intellectual property and commercialisation**

### **5.5 Dissemination infrastructures and repositories**

The Institute has several laboratories, centralised equipment, and resources open to researchers.

Each department and unit has its own set of procedures. Researchers should be encouraged to contact the department or unit directly if interested in any facility use, information or administration and activities of RIND.

The list of core facilities and equipment in the Institute are:

- i. HPLC Agilent 1260 Infinity II.
- ii. COBAS 4800.
- iii. Gas Chromatography-Mass Spectrophotometer.
- iv. Oligo synthesizer.
- v. Seqstudio Genetic analyser (for capillary sequencing).
- vi. In-Vitro Gen Thermosphere Scientific Flow cytometer.
- vii. MGI SP-100 DNA Library Preparation Equipment.
- viii. DNBSEQ G-50 Sequencer (Next Generation Sequencer).
- ix. Minion.
- x. Agilent Bioanalyzer.
- xi. Automated Food pathogen detection analyser.
- xii. Protein Purification Equipment.
- xiii. Malaria culture laboratory for in vivo and invitro parasite culture.

## **SECTION SIX HUMAN RESOURCES AND RELATIONSHIPS**

The RIND is the central coordinating point for the management of research and innovation activities within the Institute. RIND is primarily saddled with the business of coordinating research and innovation in the institute, both internally and externally funded.

The team that makes up the NIMR RIND comprises:

1. Director General
2. RIND Director

- e. Creating strategic plans aimed at strengthening consultation services to various government departments, industries and professional bodies.
- f. Networking with the public and industry for consultation and commercialization purposes.
- g. Promoting collaboration among research institutions, universities and industries in technology transfer, academic, training programs and related matters.
- h. Supporting efforts to promote research activities through consultations.
- i. Encouraging the application of research findings into policies, industries and society is one of the social responsibilities of NIMR.
- j. Giving recognition to staff who can generate income for NIMR through innovative research.
- k. Identifying and strengthening expertise in niche areas as NIMR has expertise in various fields.
- l. Working with private companies to complement expertise to handle the needs of a multi-disciplinary project as required by clients.

## **SECTION FIVE: INFRASTRUCTURE**

Research and innovation infrastructure denotes a wide range of tools, facilities and other resources that are fundamental for the scientist to innovate research products that have the potential to address real-life problems. The term infrastructure also implies knowledge centres that provide services to research scientists, and are based on a set of specific knowledge, techniques, and skills. Novel innovations and knowledge can only grow in a research environment with adequate infrastructures.

NIMR's status as the apex and leading research institute in Nigeria and the West African sub-region, will be further enhanced by RIND's network of cutting-edge, competitive, high-quality, accessible research and innovation infrastructures which include:

### **5.1 Physical Research Facilities, Instruments and Equipment**

- i. RIND Incubation Laboratory.
- ii. Central Research Laboratory equipped with the scientific equipment for complex experiments.
- iii. Departmental and Units research laboratory facilities.

### **5.2 Knowledge-Based Resources (scientific collections, data service, and biobanks)**

- i. Libraries, databases, archives, networked computer infrastructure etc.

## **SECTION SEVEN FINANCING AND RESOURCE MOBILISATION**

### **7.1 Rationale**

The establishment of resource mobilization and accountability mechanisms is very key to the success of NIMR-RIND.

For this Policy to achieve the desired objective and impact, there is a need to institute a reliable and sustainable funding framework from the government, private sector and development partners. This will ensure adequate funding for RIND in NIMR and its activities for sustainable development.

### **7.2 Objective**

To ensure investment of adequate resources in research, development and innovation for sustainable development in NIMR-RIND

### **7.3 Strategies**

- i. Establishing a NIMR Research, Innovations and Development Fund with a minimum of 0.5% of total NIMR Grant Admin Charges in a year, to fund RIND activities.
- ii. Making adequate annual budgetary allocation from research and development fund to RIND activities.
- iii. Engaging public & private partnerships to fund innovations developed by RIND that are of interest to them at an agreed commercial rate when the invention is effectually sold to finance RIND activities.
- iv. Encouraging the development of financial institutions e.g., Bank of Industry, Nigerian Export-Import Bank, Commercial banks, ITF TETFUND etc.) to set the percentage of their loanable funds at low interest to finance RIND identified innovative ideas.
- v. Developing robust mechanisms to attract international funding for research development and innovation in Nigeria.
- vi. Solicit foreign aid or assistance from bilateral or multilateral agencies.
- vii. Any other sums accruing to the RIND from time to time by way of gifts, grants, emoluments or bequest.

### **7.4 The Funds generated by RIND shall be applied as follows: -**

- i. For general Administration and performance of RIND functions which include payments of personnel and allowances of officers engaged by the Unit.
- ii. Training of members of staff

3. Advisory Committee (To be nominated by the RIND Director with the Director General's approval)
4. Technology Transfer/Commercialisation unit (To be nominated by the RIND Director with the Director General's approval)
5. TWG (To be nominated by the RIND Director with the Director General's approval)
6. Core staff (PMD, PME, Technicians, Technologists, Biomedical Engineers etc.) (To be nominated by the RIND Director with the Director General's approval)
7. RIND-associated Researchers (Can come from various research departments within the Institute)
8. Administrative support staff (Secretary, Accountant, Clerks, Drivers etc.)

## **6.1 Partnerships (local, regional, and international collaborations)**

The RIND Public-private partnership will include, but is not limited the under-listed organisation.

### **6.1.1 Public**

- i. Nigerian Centre for Disease Control (NCDC)
- ii. Centre for Human and Zoonotic Virology (CHAZVY), CMUL-Lagos
- iii. Biorepository Clinical Virology Laboratory (BCVL), UCH-Ibadan
- iv. National Office for Technology Acquisition and Promotion (NOTAP)
- v. Obafemi Awolowo University (OAU), Ile-Ife
- vi. The University of Lagos, Dept. of Cell Biology and Genetics.
- vii. Dept. of Haematology and Blood Transfusion, Usman Danfodio University Teaching Hospital, Sokoto
- viii. Dept. of Haematology and Blood Transfusion, University of Nigeria Teaching Hospital Enugu
- ix. Dept. of Biotechnology, Nigerian Institute of Oceanography & Marine Research, Lagos

### **6.1.2 Private**

- i. Biologix
- ii. 54Gene
- iii. Clina-Lancet Laboratories
- iv. CCHub
- v. Opolo Global Innovation Ltd
- vi. Etc.

### 8.2.1 The three levels of implementation of NIMR RIND

- a) At the state/geographical zone/national level, where a gap for innovation into diseases of public health importance is identified and addressed. Whereby intellectual property ownership and endorsement are assured.
- b) At the African regional level, where initiatives to be developed will engage other African countries.
- c) At the global level, where activities are carried out in collaboration with global partners and where NIMR RIND is given a primary role and convening power to undertake innovative research.

### 8.3 Implementation, M&E Logical Framework

The Logical framework monitors the evolution of a specific project situation. It links inputs/actions to the outcomes observed and, eventually, the impact outcomes. (Figure 1).

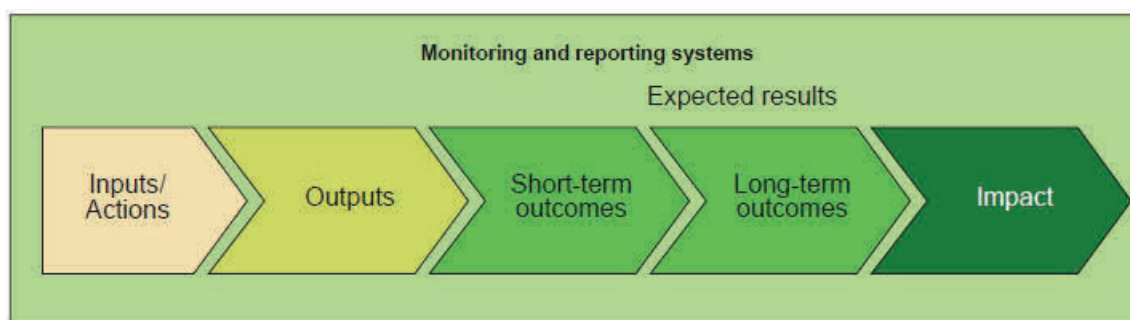


Figure 1: The Logic Framework

### 8.4 Monitoring and Evaluation of Research Innovation

The aim of the monitoring and evaluation of research innovation is to develop a mechanism for monitoring the progress made by innovators and to be able to evaluate the long-term impact of research innovation.

All research innovation proposals that received a positive decision shall be monitored and evaluated periodically throughout the project life cycle.

### 8.5 Action Points for Monitoring and Evaluating Research Innovation

- i. M and E systems will be established to monitor the performance and progress of the implementation of each specific objective (4.2.1, 4.2.2, 4.2.3) under strategic objective 4.1
- ii. Progress reports of projects will be submitted to the Monitoring and Evaluation Unit periodically.



- iii. Publication and promotion of research and innovation results/outputs
- iv. Funding innovative research proposals
- v. Funding products validations, patenting, registration etc.

Also, the RIND shall, not later than 31st October in each year, submit to the NIMR Management for approval, its programme of activities and estimate of its income and payments for the next succeeding year.

RIND shall prepare and submit to the NIMR Management not later than 31st March of each year, a report on the activities of the Unit for the preceding year.

RIND shall keep proper accounts in respect of each year and proper records in relation thereto and cause same to be reviewed by Institute's internal audit from time to time.

## **Section 8.0 OVERVIEW OF RIND IMPLEMENTATION, MONITORING AND EVALUATION**

### **8.1 Background**

NIMR Research Innovation and Development (RIND) project/programme performance will be evaluated by NIMR Monitoring and Evaluation (M&E) Unit with a focus on the NIMR Strategic Plan Thematic Area 4 coined, “**Research Innovation and Entrepreneurship**”.

NIMR SP Thematic Area 4 proposes for RIND, strategic objective 4.1 which has three specific objectives (4.2.1, 4.2.2, 4.2.3). The strategic objective is to strengthen the RIND Unit to be more responsive to research and promote innovation to tackle diseases of public health importance in Nigeria. Also, to add to existing knowledge and manage intellectual property rights.

Consequently, an implementation, monitoring and evaluation system is required for innovation and intellectual property to monitor output and performance, provide stakeholders with regular updates on the results achieved and provide evidence for future needs when interventions are required.

### **8.2 Implementation of RIND**

Implementation of RIND is spread among diverse stakeholders, including governments, academia, civil society organizations, international organizations, non-governmental organizations and the private sector. The implementation phase is carried out based on the study plan that has a time frame and detailed a procedure. The progress of the study is monitored accordingly, using targets and progress indicators to produce outputs that will induce the changes envisaged in the short- and long-term course. NIMR RIND implementation plan shall be in three levels.

- iii. A comprehensive evaluation of the specific objectives (4.2.1, 4.2.2, 4.2.3) will be undertaken yearly

**8.6 The three specific objectives for RIND based on NIMR's current strategic plan are stated as follows:**

- To identify gaps and provide solutions in medical diagnostics, drugs and vaccines research and development.
- To provide grants to support innovation.
- To establish a patent office and create channels for research products commercialization

The follow-up M&E review intervals will be determined by the nature and the events of research projects/programme. In the case of premature suspension/termination of a study, the researcher should notify NIMR M & E Unit of the reason(s) for suspension/termination of study and a summary of results obtained in such prematurely suspended/terminated study should be communicated to M&E Unit by the researcher.

**8.7 The M&E Work plan**

RIND M&E work-plan for a specific study will define the audience, the content, the format and the frequency of reporting of the study performance. Table 1 presents a sample M&E work plan.

**Table 1: M&E Work plan**

	2022				2023			
	Jan-Mar	April-June	July-Sep	Oct-Dec	Jan-Mar	April-June	July-Sep	Oct-Dec
Informal consultative group work								
Refinement of indicators for innovative research								
Formal consultative group appointment								
Finalize M&E framework								
Develop M&E plan								
Mock-up								
Develop data dictionary/standards								
Data collection tools & instruments								
Commission research for baseline								
Stakeholders' consultation meeting								
Advocacy								
Source sustainable funding								
Ongoing monitoring /feedback								
Evaluation report to WHA								
Report to WHA every year								

### 8.7.1 M&E Plan

RIND M&E plan will link actions/outputs to outcomes and impact, based on identified indicators.

An example of an M&E plan is represented in Figure 2 as follows:

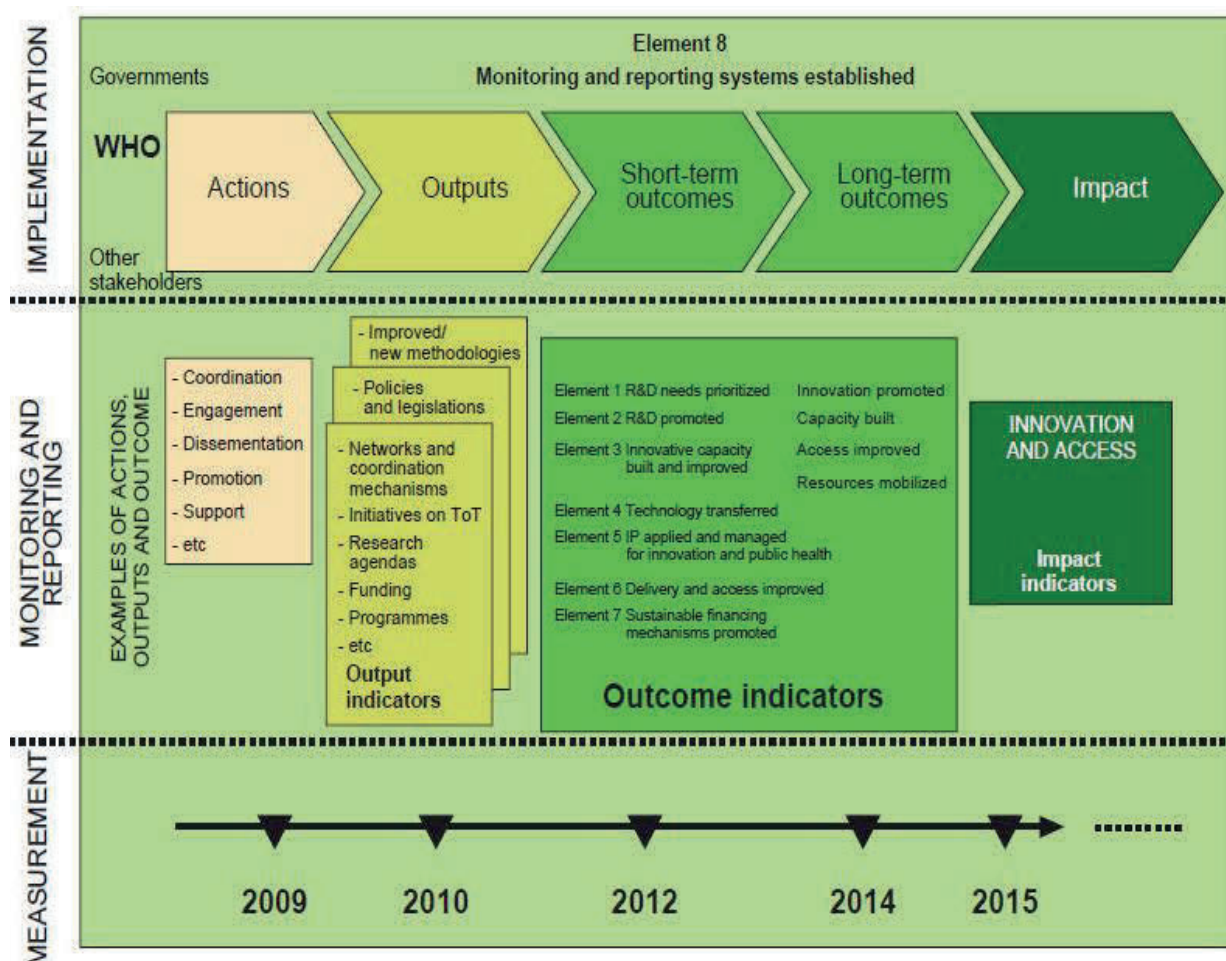


Figure 2 M&E Plan

### 8.8 MONITORING AND REPORTING USING RESULTS' CHAIN MODEL

RIND results chain will build a logical relationship between expected results of specific innovative research that will be built on the aggregation of results over time. It will be based on output and outcome indicators linked with longer-term changes (or impact) that the study will produce. The resulting chain identifies the deliverables and intended changes (targets) belonging to the particular study. (Figure 3).

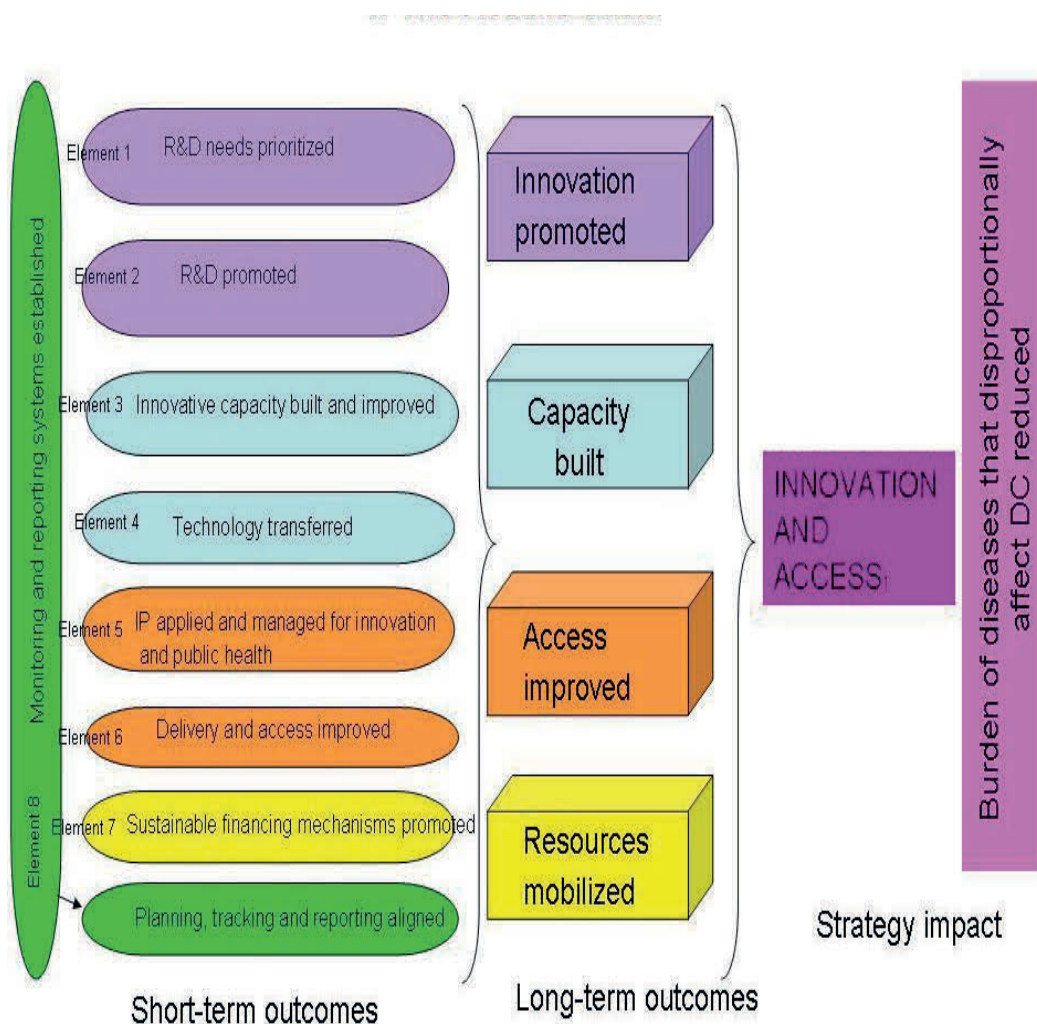


Figure 3: The results' chain model

RIND results chain takes into consideration, eight short-term outcomes (expected results).

1. Element 1 - Assessment of the public health needs in Nigeria with and identify research priorities at the state, zonal and national levels.
2. Element 2 - Promote innovative research focusing on identified gaps.
3. Element 3 - Build and improve innovative capacity for research and development.
4. Element 4 - Improve, promote and accelerate the transfer of technology between states, regions and nations.
5. Element 5 – Encourage and support the application and management of intellectual property in a manner that maximizes health-related innovation, protects public health and promotes access to medicines for all.

6. Element 6 - Improve delivery of and access to all health products and medical devices by effectively overcoming barriers to access.
7. Element 7 - Secure and enhance sustainable financing mechanisms for innovative research.
8. Element 8 - Develop mechanisms to monitor and evaluate the implementation of the NIMR strategy objective 4.1, plan of action and effective reporting systems.

Research innovative intermediate (long term) results to be achieved are such as innovation promoted, capacity building, medical access improved and resources mobilized. In addition, the impact result expected is that the burden of diseases that inappropriately affect Nigeria is reduced.

## **8.9 Evaluation and Learning**

Finally, the innovative research evaluation plan should include self and independent evaluation whereby the right environment is created to share experience, disseminate results, discuss the progress of results and issues of concern as well as incorporate feedback into the relevant phase of the study implementation period for overall learning and project improvement.

## **SECTION NINE The Major Constraint and Way forward**

### **9.1 The Major Constraint of Nascent RIND Unit**

RIND started operation as a Unit in 2019, and has leveraged on "low hanging fruits" to translate some research ideas into the innovative, quality and affordable medical products and services. However, the current staff strength is still very small. Apart from the contract Technician and Chief Clerical Officer/Secretary, there is no other 100% dedicated staff for the unit. The RIND committee chairman and two NIMR staff are working on an ad-hoc basis with the mentioned full-time RIND staff to keep RIND going as a Unit. To augment the activities of the above-mentioned personnel, research fellows from various research departments who expressed interest in innovative research were co-opted as product validation and trial team.

There is an inadequate budget line for RIND which affects the current performance. Funding by donors and partners is usually based on their area of priority and is often not sustainable. It is envisaged that soon RIND will generate additional funds for administrative oversight from patents and commercialized products.

## **9.2 Way Forward**

RIND should start operating as a Centre with various Units as detailed on the Organogram to fulfil the expected mandate.

It is therefore essential that a dedicated budget line be established and connecting of additional funding from all other sources be harmonized. The establishment of resource mobilization and accountability mechanisms is very key to the success of NIMR -RIND.



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## APPENDICES

### APPENDIX I: SWOT ANALYSIS ON PERFORMANCE OF RIND FROM INCEPTION

A SWOT analysis was performed to identify our strengths, weaknesses, opportunities, and threats. Strengths, weaknesses, opportunities, and threats identified are shown in Table 1 below. Using RIND's identified strengths, strategies were formulated to help RIND maximize its opportunities and to minimize the threats (Table 2). Similarly, actions that point to using our opportunities to minimize our weaknesses are proposed (Table 2). Activities needful to minimize our weaknesses and avoid the threats are identified.

**Table 2: Results of RIND's SWOT Analysis**

<p><b>STRENGTHS</b></p> <ol style="list-style-type: none"> <li>1. Highly skilled personnel</li> <li>2. Availability of modern and high throughput equipment</li> <li>3. A government institution with research mandate for national development</li> <li>4. Can engage both private and governmental partners such as CDCs</li> <li>5. Staff and department with expertise across the R&amp;D pipeline</li> <li>6. Having recognized Centres of Excellence</li> </ol>	<p><b>OPPORTUNITIES</b></p> <ol style="list-style-type: none"> <li>1. Respected and stable Institution</li> <li>2. Nigerian private sector is now more amenable to supporting medical research</li> <li>3. Can pioneer the Biotech Silicon Valley of Nigeria</li> <li>4. Having young upcoming scientists mould for products mentality</li> <li>5. Approachable leadership and current public expectations from the health industry</li> <li>6. Location and opportunities for collaboration</li> <li>7. Current management support for RIND</li> </ol>
<p><b>WEAKNESSES</b></p> <ol style="list-style-type: none"> <li>8. Not enough funding to support pilot studies for R&amp;D</li> <li>9. Inappropriate structure and lack of competent staff for RIND activities</li> <li>10. <b>Lack</b> of support to scientists in securing patents and IPOs</li> <li>11. No framework for going from bench to bedside</li> <li>12. Poorly motivated and poorly compensated staff</li> <li>13. Personnel stretched thin between different activities and projects</li> <li>14. Limited research faculty orientation to services and products as endpoints</li> </ol>	<p><b>THREATS</b></p> <ol style="list-style-type: none"> <li>15. The emergence of private forward-looking Biotechs in our space</li> <li>16. Staff and trainees poached by other facilities</li> <li>17. Unconducive environment for good manufacturing practices (GMP) for prototype diagnostics, drugs and vaccines</li> <li>18. Government bureaucracy hinders fast implementation at the best prices due to the use of contractors for supplies</li> </ol>

**Table 3: Prioritizing SWOT analysis into actionable strategies for RIND**

	<b>OPPORTUNITIES</b> <ol style="list-style-type: none"> <li>1. Respected and stable Institution</li> <li>2. Nigerian private sector is now more amenable to supporting medical research</li> <li>3. Can pioneer the Biotech Silicon Valley of Nigeria</li> <li>4. Having a pool of young upcoming scientists with innovative drives</li> <li>5. Approachable leadership and current public expectations from the health industry</li> <li>6. Location and opportunities for collaboration</li> <li>7. Current management support for RIND</li> </ol>	<b>THREATS</b> <ol style="list-style-type: none"> <li>1. The emergence of private forward-looking Biotechs in our space</li> <li>2. Staff and trainees poached by other facilities</li> <li>3. Unconducive environment for good manufacturing practices (GMP) for prototype diagnostics, drugs and vaccines</li> <li>4. Government bureaucracy hinders fast implementation at the best prices due to the use of contractors for supplies</li> </ol>
<b>STRENGTHS</b> <ol style="list-style-type: none"> <li>1. Highly skilled personnel</li> <li>2. Availability of modern and high throughput equipment</li> <li>3. A government Institution with a research mandate for national development</li> <li>4. Can engage both private and governmental partners such as CDCs</li> <li>5. Have staff and departments with expertise across the R&amp;D pipeline</li> <li>6. Have recognized Centres of Excellence</li> </ol>	<ol style="list-style-type: none"> <li>1. Implement a well-funded and structured programme geared to improve services and products (diagnostics, drugs, and vaccines)</li> <li>2. Use our reputation, location, and social capital to engage, understudy and be mentored by Institutions successful at R&amp;D such as Oxford and BII incubators</li> <li>3. Implement an orientation programme for young and new staff to align to these targets</li> <li>4. Propose and initiate national discourse on a framework/pathway from the bench to the bedside.</li> </ol>	<ol style="list-style-type: none"> <li>1. Leverage on our national mandate to innovate and proactively engage private and national partners</li> <li>2. Establish a GMP facility with appropriate certifications for quality management systems and national regulators such as NAFDAC</li> <li>3. Implement a different track for funding and procurements for RIND to keep services and products competitive.</li> </ol>
<b>WEAKNESSES</b> <ol style="list-style-type: none"> <li>1. No funding to support pilot studies for R&amp;D</li> <li>2. Inappropriate structure and lack of competent staff for RIND activities</li> <li>3. Lack of support to secure patents &amp; IPOs</li> <li>4. No framework for going from bench to bedside</li> </ol>	<ol style="list-style-type: none"> <li>1. Sign MOUs with reputable organizations to finance research and development at NIMR</li> <li>2. Engage staff knowledgeable about IPOs, patents etc. in RIND, to drive and birth the Biotech spinoff companies</li> <li>3. Ensure scientists/patent-holders are well compensated</li> </ol>	<ol style="list-style-type: none"> <li>1. Establish an ownership and sustainability plan for RIND to become financially solvent and semi-autonomous to pursue its targets in actualizing the national mandate to NIMR</li> </ol>

5. Poorly motivated and poorly compensated staff 6. Personnel stretched thin between different activities and projects 7. Limited research faculty orientation to services and products as endpoints	and have job satisfaction to retain them 4. Provide support to scientists in securing IPOs and patents through dedicated and competent staff in RIND	
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## **Appendix II: List of NIMR Inventions**

NIMR BIOTECH DNA preparation Kit

NIMR BIOTECH RNA extraction Kit suitable for COVID-19

NIMR SARS CoV-2 Isothermal Molecular Assay (SIMA)

NIMR SARS CoV-2 Detection Assay (SCODA)

NimCure Mobile Application for Remote-Observed-Therapy for TB treatment Management

NIMR BIOTECH-Electrophoretic Machines for Haemoglobin Genotyping

NIMR BIOTECH-Haematocrit Centrifuge

NIMR BIOTECH-Biological Incubator

NIMR BIOTECH-Laboratory fitted Oven



NIMR BIOTECH BIOLOGICAL INCUBATOR AND OVEN



NIMR BIOTECH GENOTYPE MACHINES- MODEL 1



NIMR BIOTECH GENOTYPE MACHINES-MODEL 2

#### NIMR KITS AND REAGENTS









## NIMR BIOTECH GENOTYPE MACHINES- MODEL 1



### Appendix III: LIST OF CONTRIBUTORS

S/N	NAME	DESIGNATION	DEPARTMENT/ UNIT
1	Prof. N. N. Odunukwe	Director of Research & Head, RIND	Clinical Sciences & RIND
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3	Prof. O. C. Ezechi	Director of Research	Clinical Sciences
4	Prof. R. A. Audu	Director of Research	Microbiology
5	Dr. A. Z. Musa	Senior Research Fellow / Head	Monitoring and Evaluation
6	Dr. N. M. Otuonye	Deputy Director	Central Research Laboratory
7	Mr. O.B. Aina	Deputy Director,	Finance and Accounts
8	Dr. C. K. Onwuamah	Chief Research Fellow	Microbiology (Centre for Human Virology & Genomics)
9	Dr. N. N. Onyejebu	Senior Research Fellow	Microbiology (Centre for TB Research)
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11	Dr. J. O. Okwuzu	Research Fellow I	Clinical Sciences
12	Dr. T. Y. Raheem	Research Fellow I	Molecular Biology and Biotechnology
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