NIRDA

National Industrial
Research and Development
Agency

NATIONAL INDUSTRIAL RESEARCH AND DEVELOPMENT AGENCY

Strategic Plan 2018-2022

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MORE INFORMATION

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Executive summary

This *Strategic Plan 2018-2022* represents a new and exciting direction for the National Industrial Research and Development Agency (NIRDA), its partners and the private sector. It represents a shift toward a new, more agile, flexible and innovative way of working and achieving results across Rwanda's industrial sector and the broader economy.

NIRDA was established in 2013 to support the diversification of the Rwandan economy, replacing the Institute of Scientific and Technological Research. Following a recent review of its strategy and structure, we have realigned NIRDA to the central themes of the Government of Rwanda's development framework.

Through *Vision 2020*, Government has set specific targets aimed at driving Rwanda's journey to economic transformation from a subsistence agriculture economy to a knowledge-based society. *Vision 2020* stipulates that industrial sector will contribute 20 per cent of GDP by 2020, and private investment will account for an average of 20 per cent of GDP and public investment eight per cent. This renewed emphasis on industrialisation is strengthened in the Seven-Year Government Programme (2017-2024), Priority Area 4, which underscores the central role of industrialisation to attain a structural shift in the export base to high-value goods and services, with the aim of growing exports by 17 per cent annually.

NIRDA's mission is: Enabling a generation of industrial innovators to become competitive through technology monitoring, acquisition, development and transfer and applied research.

Our vision for NIRDA is: 'to be recognised as a centre of excellence in the provision of technology support services to increase the competitiveness of Rwandan industries'.

NIRDA's objectives are to:

1. **Improve the competitiveness of existing industries in order to increase their export potential or their potential to undertake import substitution.**
2. **Identify new sub-sectors or value chains where investment by the private sector would likely lead to export growth or import substitution.**

These objectives are fully in line with government's industrial policy objectives of increased domestic production for local consumption and improved export competitiveness. They are also fully in line with government's trade policy objectives of:

- Increased productivity, competitiveness and diversified sustainable productive capacities for trading nationally, sub-regionally, regionally and internationally;
- Increasing investment, including foreign direct investment, into production of competitive goods and services for the export market; and
- Strengthened science, technology and innovation policies, strategies and institutions including intellectual property laws, in support of industrial development and creative knowledge-based industries.

The following values shape our strategy and approach in all that we do:

- *Teamwork*. Our people have the drive and passion to partner with our clients and collaborate with one another to make our solutions work. We care for each other, respect people as individuals, listen to understand, and seek to enrich the lives of those we work with.
- *Integrity*. We live the highest standards of ethics and fiscal responsibility. We give and stand by our best advice as part of our quest to make our clients successful. To be honest, sincere and reliable is the way to earn trust and build long-term relationships.

- *Excellence*. We strive to be the best that we can be, using our talents and abilities to reach out and fulfil our potential. We strive to bring the power of knowledge, the spirit of optimism, and the discipline of persistence to the pursuit of excellence.
- *Innovation*. We need imagination, innovation and initiative to help create a better future for Rwanda's people

Five pillars establish the framework for the NIRDA strategy:

Key Pillar 1: Institutional capacity development: This ensures NIRDA has the institutional capability and capacity to implement the Strategic Plan 2018-2022

Key Pillar 2: Technology and operational monitoring: NIRDA will establish a sound knowledge base of technology developments within the region and globally to allow the selection of priority value chains for technological upgrading. Knowledge will underpin decision making at all levels of the institution. We will clearly identify when and how NIRDA's interventions have led to increases in the productivity and competitiveness of supported enterprises.

Key Pillar 3: Technology acquisition, commercialisation and transfer: NIRDA will support partner enterprises in selected value chains to help them improve their competitiveness through the acquisition and commercialisation of appropriate technologies. We will support the replication of successful pilot projects by a large number of private enterprises.

Key Pillar 4: Applied research and technology foresight: NIRDA will undertake pre-commercial exploratory applied research and development leads to the development of an area of capability or a technology platform that is likely to lead to increased competitiveness or the opening of a new market opportunity. We will identify emerging technologies likely to yield the greatest economic and social benefits to Rwanda in the future and will provide innovation laboratories for testing and prototyping new technology for future industries. We will undertake collaborative projects with frontier industry technology providers and build networks to promote innovations for future industries

Key Pillar 5: Business and technical development and advisory services to support industries: NIRDA will support and develop market systems designed to improve the access Rwandan enterprises have to business and financial services, so that they are more able to compete in national, regional and global markets and better equipped to develop, acquire or transfer the technology they require.

Ultimately, NIRDA's engagement with strategic and business partners will lead to more enterprises investing in technology and acquiring or transferring technologies leading to increased sales, more jobs and better market share. This will contribute to increasing Rwanda's export and reduce imports.

Underpinning this strategy and its implementation is a sound knowledge management system and a robust monitoring and evaluation system, which is integrated with the Government of Rwanda's rules and regulations.

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1 Introduction

The National Industrial Research and Development Agency (NIRDA) was established in 2013 to support the diversification of the Rwandan economy, replacing the Institute of Scientific and Technological Research.

The Government of Rwanda set itself specific targets in Vision 2020 aimed at driving Rwanda's journey to economic transformation from a subsistence agriculture economy to a knowledge-based society. Vision 2020 stipulates that industrial sector will contribute 20 per cent of GDP by 2020, and private investment will account for an average of 20 per cent of GDP and public investment eight per cent.

In 2016, a strategic review of NIRDA was undertaken, which has informed the formulation of the Strategic Plan 2018-2022, which the NIRDA Board of Directors approved in October 2017.[1]

The new NIRDA strategy accentuates a vital and practical approach to supporting Rwandan industries through technology acquisition and applied research and development. This renewed emphasis reflects the vision of the Government of Rwanda, as defined in the new 7-Year Government Programme (2017-2024), Priority Area 4, which underscores the central role of industrialisation to attain a structural shift in the export base to high-value goods and services, with the aim of growing exports by 17 per cent annually.

While, remaining true to its mandate and objectives, the reorganisation of NIRDA, emphasises NIRDA's need to refocus and strengthen support to Rwanda's industries through five key pillars:

1. Institutional capacity development;
2. Technology monitoring and operational monitoring;
3. Technology acquisition, commercialisation and transfer;
4. Applied research and development; and
5. Industrial business and technical development and advisory services.

In addition, NIRDA will support a process of technology foresight, designed to examine industrial technologies that will be relevant to Rwanda in the next 10 to 20 years.

NIRDA has formulated a Single Action Plan (SAP) for 2018 and an Implementation Plan for 2018 to 2022 in line with Government planning and budgeting processes. Similarly, the Mid-Term Expenditure Framework (MTEF) is submitted in accordance with Government requirements.

The new directions established in the strategy require a revised agency structure, which is more closely aligned with NIRDA's mission, vision and values, and the organisation of programme interventions as described by the NIRDA Work Flow. The new structure is presented in the annexes (see Annex 1 and 2). This structure will allow staff to better use their skills and experiences across the whole organisation.

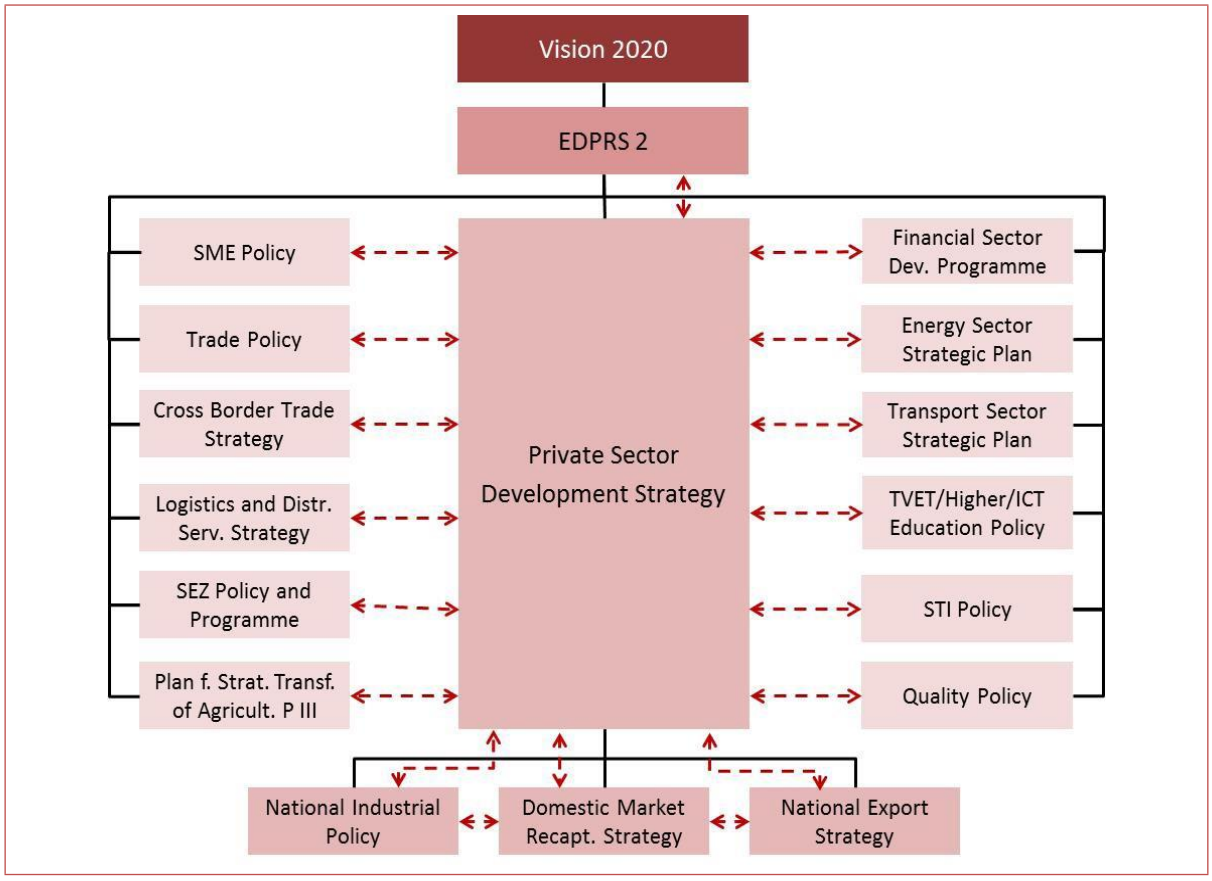
[1] This was supported by by the Korea International Cooperation Agency (KOICA) and the United National Industrial Development Organization (UNIDO).

2 The policy context

The Government of Rwanda has established a number of important strategies and policies for the development of its productive sectors (see Figure 1).

Formulated in 2000, *Vision 2020* has established long term development goals and sets Rwanda on a path to economic transformation from a 'subsistence agriculture economy to a knowledge-based society'. It describes the role of science, technology and innovation in spurring socio-economic development and improving the general welfare of Rwandan lives. Specifically, science and technology will contribute to the target of transforming Rwanda to a middle-income country by the year 2020, increasing Gross Domestic Product per capita (from US$220 dollars in 2000 to US$1,240 dollars in 2020) and growing the economy at an average of 11.5 per cent per annum through the generation, dissemination and integration of technological innovations.

Figure 1: Policy Map focusing on Private Sector Development



Source: Domestic Market Recapturing Strategy, March 2015

In line with *Vision 2020*, policies and strategies formulated within the framework of the first and second *Economic Development and Poverty Reduction Strategies* (i.e., EDPRS 1, 2008-2013, and EDPRS2, 2013-2018) focus on economic growth and diversification by strengthening the role of the private sector. In order to meet the private sector development goals of EDPRS 2, the Government developed the Private Sector Development Strategy to 'develop an entrepreneurial, innovative and competitive sector that delivers broad band and inclusive

economic growth'. EDPRS 2 includes strategies to improve productivity and youth employment by developing skills and competencies that support growth of the private sector as the driving force to accelerate economic development and poverty reduction. The use of improved technology is identified, under the fourth pillar, as a channel for improving business, agricultural and labour market efficiencies. EDPRS2 also seeks to 'further integrate value chains and support ongoing investments to strengthen interlinkages between processors and suppliers', 'to encourage private sector investment in the agro-processing sector', and to 'accelerate the growth of exports'.

NIRDA's mission echoes the ninth Sustainable Development Goal (SDG-9), but also aligns with many other SDGs, including those related to poverty eradication, creating full and productive employment, protecting the environment, achieving gender equality and the empowerment of women and girls, etc. Amongst the targets of SDG-9 that NIRDA expects to contribute to are:

1. Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries;

2. By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities;

3. Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per one million people and public and private research and development spending;

4. Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

NIRDA is firmly based within the *National Industrial Policy* (2011) in which NIRDA is expected to contribute to increased domestic production for local consumption and improved export competitiveness. Moreover, the *National Trade Policy* (2010) creates an opportunity for NIRDA to contribute to the objectives of: increased productivity, competitiveness and diversified sustainable productive capacities for trading nationally, sub-regionally, regionally and internationally; strengthened science, technology and innovation policies, strategies and institutions including intellectual property laws, in support of industrial development and creative knowledge-based industries.

Similarly, NIRDA recognises the *Domestic Market Recapturing Strategy* (2015), which seeks to increase domestic production for local consumption while contributing to structural transformation of the productive sector and increasing international competitiveness. This corresponds with the *Made in Rwanda Policy* (2016) and its objective of boosting the production of competitive local value-added products, while stimulating sustainable demand. In addition, the *National Export Strategy II* aims to improve the ability of firms to produce goods of sufficient quality and quantity to supply potential export markets. This requires an environment that supports and encourages firms to rapidly invest and begin production or increase output through productivity gains.

NIRDA is closely aligned to the draft 2016 *National Science, Technology Innovation and Research Policy* and its focus on knowledge acquisition and deepening, knowledge creation and transfer, innovation and entrepreneurship culture. NIRDA's technology foresight programme, in particular, will provide valuable inputs into the formulation of future policy in science and technology.

The National Strategy for *Climate Change and Low Carbon Development* (2010) supports Rwanda to become a developed, climate-resilient, low-carbon economy by 2050. This includes the support for green industry and technology development.

NIRDA recognises and supports the objectives of the *Intellectual Property Rights Policy* (2009), which include:

1. Increasing technological literacy and advanced scientific and technological skills that in turn would increase the innovation capacity;
2. Promoting innovation and creativity, including minor and incremental innovations to provide an opportunity for the largest number of individuals and firms to participate in innovation;
3. Increasing access to foreign and local technology by local firms and research institutions;
4. Improving access to IP-based essential goods and services especially health and food; and
5. Facilitating investments in innovative and creative activities.

The *Small and Medium Enterprise Development Policy* (2010) seeks to promote innovation and technical capacity of SMEs for competitiveness. This is a clear goal of the NIRDA strategic plan.

Finally, the NIRDA strategy also supports the implementation of the *Seven-Year Government Programme: A National Strategy for Transformation* (2017-2024) which is focused on three pillars: economic, social and governance. Through this strategy, government aims to create 1.5 million productive jobs, and boost support to the private sector.

3 Our purpose

NIRDA's mission is: enabling a generation of industrial innovators to become competitive through technology monitoring, acquisition, development and transfer and applied research.

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4 Our approach

This strategy lays out NIRDA's approach to contributing to the vision of Rwanda's industrial policy, which is to have 'competitive industrial and advanced services sectors producing over $1.5 billion of exports by 2020, while increasing the number of off farm jobs'.[2]

Specifically, NIRDA aims to apply technology to:

- Improve the competitiveness of existing Rwandan enterprises in selected value chains so as to increase their export potential or their potential to undertake import substitution; and
- Support Rwandan enterprises to enter into new value chains where investment by private sector enterprises would likely lead to export growth or import substitution.

NIRDA will also look into the future through a process of technology foresight to:

- Identify emerging generic technologies relevant to and likely to yield the greatest economic and social benefits to Rwanda in the future;
- Identify emerging technologies relevant to yield the greatest economic and social benefits to Rwanda in the future;
- Provide innovation laboratories for testing and prototyping new technology for future industries;
- Undertake collaborative projects with frontier industry technology providers; and
- Build networks and promote innovations for future industries.

The NIRDA Strategic Plan will be implemented through a range of programmes, services and projects delivered primarily in partnership with the private sector. NIRDA will also contribute to other public and private initiatives to strengthen the competitiveness of Rwanda industry, as outlined in *Vision 2020*.

As NIRDA's main aim is to serve private enterprises, it will become more 'business-like' in the way it works with the private sector: improving its business processes and its staff's awareness and understanding of business and the commercial application of technology.

The implementation of the strategy is based on a holistic view in which policies and programmes are well coordinated and integrated. NIRDA engage with and respond to the private sector and strengthen its approach to learning and knowledge management.

NIRDA will work with Rwandan enterprises (at firm level) to help them innovate to improve their competitiveness.

4.1 Theory of change

NIRDA's theory of change describes the inter-connections of all its activities, outputs and outcomes required to achieve impact. The theory of change is depicted on a map known as a results chain. NIRDA's results chain is a simple but powerful management tool that is a visual representation of how NIRDA works. It maps out the sequence of events leading to the achievement of NIRDA's objectives.

2 Industry is expected to account for 20 per cent of GDP by 2020; the national investment rate to reach 30 per cent of GDP; and non-farm employment to reach 1.4 million.

A results chain for NIRDA has been developed through extensive interaction with key NIRDA staff, directors and stakeholders. This demonstrates how NIRDA's activities are expected to bring about our high-level goals (i.e., increasing exports and decreasing imports) by depicting the pathway from activities through outputs and outcomes to impact. The results chain clearly demonstrates a summary of the change process and presents a set of indicators for measuring this.

Figure 2: NIRDA Theory of Change

<table>
<tr><td rowspan="2">IMPACT</td><td colspan="2">Increased exports.</td><td>Decline in imports.</td></tr>
<tr><td colspan="3">More enterprises invest in developing, acquiring or transferring technologies leading to increased sales, more jobs and better market share.</td></tr>
<tr><td rowspan="3">OUTCOMES</td><td colspan="3">NIRDA demonstrates independently verified success of supported enterprises in selected value chains</td></tr>
<tr><td colspan="3">Increased competitiveness of supported enterprises in selected value chains</td></tr>
<tr><td colspan="3">Additional enterprises in the selected value chains develop, acquire or transfer the technology tested or demonstrated in the NIRDA projects</td></tr>
<tr><td rowspan="3">OUTPUTS</td><td colspan="3">Knowledge products (e.g., lessons, case studies, guides) produced for distribution and use among Rwandan industry.</td></tr>
<tr><td colspan="3">Technology is developed, acquired or transferred among project participants in the selected priority value chains.</td></tr>
<tr><td colspan="3">Results of technology development, acquisition or transfer are assessed and documented.</td></tr>
<tr><td rowspan="2">ENTERPRISE ACTIVITIES</td><td colspan="3">NIRDA projects undertaken in partnership with strategic and private partners.</td></tr>
<tr><td colspan="2">Private sector responds to Open Call by sharing their needs through submission of Project Concept Note and Project Applications.</td><td>NIRDA's research interests and technology opportunities responds to the needs of the Private sector.</td></tr>
<tr><td rowspan="4">NIRDA ACTIVITIES</td><td colspan="3">Projects monitored and evaluated, with key lessons documents.</td></tr>
<tr><td colspan="3">Projects selected and implemented.</td></tr>
<tr><td>Competitive Open Call for private sector partnership projects.</td><td>Engagement with private sector partners on applied R&D projects.</td><td>Research undertaken with strategic or private partners on new technologies.</td></tr>
<tr><td>Research into selected value chains (assessing industry demands).</td><td>Applied research into new and existing value chains.</td><td>Forecasting the use of new technologies.</td></tr>
</table>

4.2 Strategic pillars

NIRDA's strategy is organised around four key pillars, which are all essential to the achievement of its objective of supporting an increase in exports and a reduction in imports.

Figure 3: NIRDA strategy pillars

Key pillars	Expected outcomes	Rationale
Key Pillar 1: Institutional capacity development	NIRDA has the institutional capability and capacity to implement the Strategic Plan 2018-2022	NIRDA will develop the skills of staff, develop systems and procedures to improve efficiency, develop the organisational structure to suit the mandate, and ensure the style and shared values of the agency are appropriate to its new and challenging mandate. Institutional development will ensure that NIRDA is able, agile and equipped to respond to the needs of the private sector. Key Pillar 1 is an essential precursor to strategy implementation.
Key Pillar 2: Technology and Operational Monitoring	Sound knowledge base of technology developments within the region and globally to allow the selection of priority value chains for technological upgrading. Clear identification of when and how NIRDA's interventions have led to increases in the productivity and competitiveness of supported enterprises.	NIRDA's profound and accurate knowledge of the technology and competitiveness issues facing enterprises priority value chains underpins NIRDA's support programmes, projects and services. NIRDA will monitor the operational performance of supported enterprises and, if the support led to significant performance growth, encourage replication by a large number of enterprises to achieve impact at scale through Key Pillar 3.
Key Pillar 3: Technology Acquisition, Commercialisation and Transfer	Pilot enterprises in selected value chains are supported by NIRDA to improve their competitiveness through the acquisition and commercialisation of appropriate technologies. Replication by a large number of enterprises of the actions of pilot enterprises which increased their competitiveness through the development and use of appropriate technologies.	The acquisition and commercialisation of known technologies is often the most appropriate solution to increasing the competitiveness of Rwandan enterprises. When such acquisition and commercialisation has proven successful, then this success will be replicated through a process of technology transfer to other enterprises in the same or similar value chains.
Key Pillar 4: Applied Research and Technology Foresight	Pre-commercial exploratory applied research and development leads to the development of an area of capability or a technology platform that is likely to lead to increased competitiveness or the opening of a new market opportunity. NIRDA will identify emerging generic technologies relevant to yield the greatest economic and social benefits to Rwanda in the future.	In instances where pre-commercial research is needed to make investment in the value chain attractive to the private sector or where appropriate technology cannot be acquired (or where such technology needs significant adaptation to make it viable in a Rwandan environment), then NIRDA will support through applied research the development of appropriate new technologies or the adaptation of existing technologies to improve the competitiveness of partner enterprises in selected value chains. NIRDA apply technology foresight to identify possible future growth scenarios for Rwanda's industrial sector and seek to identify how best to establish the necessary

Key pillars	Expected outcomes	Rationale
	We will provide innovation laboratories for testing and prototyping new technology for future industries. We will undertake collaborative projects with frontier industry technology providers and build networks to promote innovations for future industries	fundamentals for the growth of future sub-sectors, value chains, products or services.
Key Pillar 5: Business and technical development and advisory services to support Industries	High number of applications for NIRDA support in technology acquisition, commercialisation, development or transfer from enterprises in the selected value chains	This pillar recognises enterprises need access to a range of business development and financial services in order to either apply for support from NIRDA; access and commercialise acquired technology, or use technologies developed or adapted by NIRDA in an efficient and effective manner.

5 Targeting our interventions

5.1 Working in priority sub-sectors and value chains

We are committed to focusing and specialising on those areas where we can have most impact and adopt matrix structures to allow us to be flexible and responsive, rather than develop 'knowledge silos' which reduce its agility.

A critical first phase of this process is to determine which value chains offer the best prospects of achieving NIRDA's objectives goal (i.e., either increased exports or import substitution) in the most cost effective and efficient manner.

NIRDA reviews value chains considering the potential for:

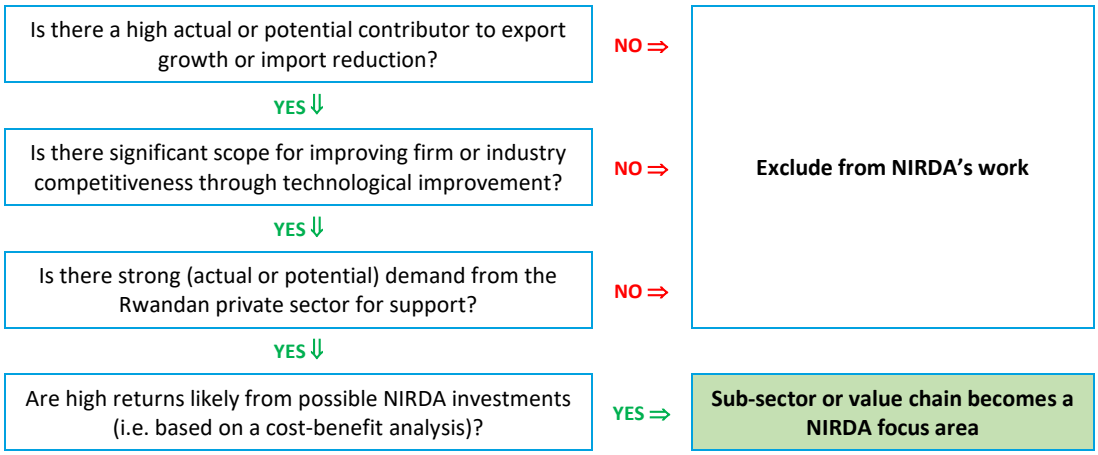
- Upgrading: actions to help Rwanda enterprises move to a higher value-added component of a value chain;
- Extending: actions to broaden an existing value chain to increase its full potential job creation and value-added impact;
- Optimising: actions to improve operation of certain links of the value chain to achieve greater value added); and
- Targeting: identification of a new value chain or sector that Rwanda has the required endowments for but that has not been developed, or adequately developed).

NIRDA selects value chains in the following manner:

- Using government's priority sector list as an initial longlist of sectors, sub-sector and value chains, NIRDA will determine which offer the best prospects of achieving its goal (i.e., either increased exports or import substitution) through the increased competitiveness of existing enterprises in the most cost effective and efficient manner;
- Undertake a brief market assessment to identify local, national and regional trends, market size, supply and demand gaps, imports and exports, distribution networks, technology requirement, etc.;
- Review the legal and regulatory environment in which the value chain operates. This review will focus on policies, incentives, available export promotion tools, financing of tangible and intangible capital outlays, training, employment, quality promotion, certification, standardization, competition, research and development, and partnerships.
- Develop a ranking score table to facilitate the selection process (using the selection matrix shown in the figure below).

NIRDA does not aspire to become a polytechnic or to provide undefined services to wide-ranging customer needs across the whole spectrum of Rwanda's industrial economy. Instead, we will partner with relevant public institutions and differentiate itself by its focus on technology and enhancing competitiveness.

Figure 4: Matrix for selecting priority value chains within existing industries



5.2 Technology intervention

NIRDA's theory of change is based upon the provision of technology support services to enterprises.

NIRDA will provide support in four key areas: technology monitoring and knowledge sharing, technology acquisition, technology development and technology transfer.

This will be supplemented with a process of Technology Foresight, which involves looking forward to the technologies that are likely to be relevant to Rwanda within ten to 20 years.

See the Figure5 below.

Figure 5: NIRDA's focal areas of technology intervention

Focal area	Main activities
Technology monitoring and knowledge sharing	Monitor technology development in the region and globally to identify technologies which focus on improving enterprise competitiveness and thus meet Rwanda's industrial priorities. Monitor the technological capacity, operational performance and needs of Rwanda's industrial sector. Share the knowledge (using modern knowledge management systems) that NIRDA gains through its monitoring processes with the commercial sector to keep them informed of developments and thus encourage innovation and investment by enterprises.
Technology acquisition	Identification and acquisition of the intellectual property rights of a needed technology where this is the most cost-effective solution
Technology development	Pre-commercial exploratory research and development to develop an area of capability or a technology platform that is likely to lead to increased competitiveness or the opening of a new market opportunity. Further work to refine and exploit that knowledge in relatively non-standardised ways, often in collaborative projects with industry.

Focal area	Main activities
Technology transfer[3]	More routine exploitation of the technology which should be mature enough to be put into specific applications: NIRDA would work bilaterally with firms, providing development, applications engineering, consultancy or other services.
Technology Foresight	Identify, test and prototype the production of emerging generic technologies relevant to and likely to yield the greatest economic and social benefits to Rwanda in the future Identify emerging generic technologies relevant to yield the greatest economic and social benefits to Rwanda in the future Provide innovation laboratories for testing and prototyping new technology for future industries Undertake collaborative projects with frontier industry technology providers. Build networks and promote innovations for future industries

NIRDA will become a knowledge-based organisation. It will gather, generate, commission and share knowledge in a highly professional manner.

While the capture of such knowledge is a function that will always require government funding, other tasks, which may produce more of a 'private good' than a 'public good' can reasonably be expected to become fee-earning once NIRDA has the appropriate internal capacity. Over an extended period of time, the amount of private funding as a proportion of total income is expected to rise. Thus, NIRDA's business model is based on applying public money to initiate its own capabilities with the expectation that these will eventually be able to be exploited commercially.

NIRDA will actively seek innovative financing to supplement government's budgetary contributions.

5.3 Technology support services

The four main areas of support are differentiated in their approach. This is described below.

5.3.1 Technology monitoring and knowledge sharing

NIRDA will become a knowledge-based organisation. It will develop detailed knowledge on priority sectors, sub-sectors and value chains, which are relevant to Rwanda's economic performance nationally, regionally and globally. It will obtain this knowledge through a mixture of internal research and monitoring of global technology trends, and by commissioning specific research from external organisations.

This knowledge will have a number of uses:

- Inform the detailed design of the Open Calls for Concept Notes: research data should allow these to be tightly focused with respect to eligible beneficiaries and activities, types of support being offered and the selection criteria for both the concept note and full application phase;

3 Technology transfer refers to the process of transferring or disseminating technology from the source of its origination to a wider range of people, enterprises and places.

- Inform the Technology Acquisition, Commercialisation and Transfer Department within NIRDA so that their marketing of the open calls to enterprises, enterprise associations and sector specific chambers is knowledgeable and persuasive;
- Support request for industrial technology related information from private industries;
- Inform prioritization of NIRDA's plans and the preparation of future NIRDA strategies and action plans; and
- Ensure lessons learned from both success and failure, as captured through monitoring and evaluation, are shared within NIRDA and with the wider enterprise community.

Thus, technology monitoring and knowledge sharing does not require a private sector partner. NIRDA will apply 'state of the art' online knowledge management systems in order to undertake this essential function effectively.

5.3.2 Technology acquisition, commercialisation and transfer

While NIRDA is not a basic research institution, it does focus on the acquisition, commercialisation and transfer of technology.

All projects in these areas will involve a partnership between NIRDA and one or more private sector enterprises, with each party's responsibilities and rights clearly defined in a contract between NIRDA and it project partners.

The process of determining which projects will get support will be competitive. NIRDA will only support those projects which are most likely to contribute significantly to the achievement of its goals.

The work flow process for identifying, designing, executing, evaluating, and replicating projects is presented in the figure 6 below.

Figure 6: NIRDA Projects Work Flow

STEP 1	**NIRDA's Technology Monitoring and Knowledge Management Division** (Knowledge Management and Operational Monitoring Department) prepare a longlist of priority sectors, sub-sectors and value chains for possible NIRDA assessment and technology audit based on consultations with Cabinet, MINICOM and the National Council of Science and Technology and derived from national policy and planning documents.
⇓	
STEP 2	**Technology Monitoring and Knowledge Management Division** analyses the longlist in accordance with agreed procedure and prepares a recommended shortlist of sectors to undergo assessment and technology audit.
⇓	
STEP 3	**NIRDA Board of Directors** reviews, refines and approves selection of shortlist.
⇓	
STEP 4	**Technology Monitoring and Knowledge Management Division** undertakes assessment and technology audit on selected sectors, sub-sectors and value chains to identify potential areas for NIRDA's interventions.
⇓	

STEP 5	**Technology Monitoring and Knowledge Management Division** prepares a report on the value chain assessment and technology audit, with clear recommendations for future NIRDA action, which is submitted to the **Director General**.
⇓	
STEP 6	Based on the findings of the Technology Monitoring and Knowledge Management Division, the **Operations and Programme Management Division** (Technology Acquisition, Transfer and Commercialisations Department) prepares the terms of reference of an Open Call for NIRDA-supported projects (i.e., a demand-oriented project based on a call for Rwanda businesses operating in the selected value chain to submit requests for support for technology development).
⇓	
STEP 7	**Operations and Programme Management Division** launches the Open Call.
	Private enterprises respond to the Open Call Private sector enquiries to NIRDA for more information (NIRDA Help Desk) Private enterprises prepare and submit a Project Concept Note (i.e., brief summary of the proposed project) via the **NIRDA Projects Portal**.
	NIRDA's Applied R&D Division prepares its own projects in response to the Open Call based on pre-commercial exploratory applied research and development to develop an area of capability or technology likely to lead to increase competitiveness or the opening of a new market opportunity **NIRDA's Applied R&D Division** prepare and submit a Project Concept Note (i.e., brief summary of the proposed project) via the **NIRDA Projects Portal**.
⇓	
STEP 8	Project Concept Notes received via the **NIRDA Projects Portal** by the due date.
⇓	
STEP 9	**Operations and Programme Management Division Manager** is responsible for the registration and coordination of all Project Concept Notes (and the Project Applications that follow) and transmits the submitted documents to the **NIRDA Projects Selection Committee**. The **Operations and Programme Management Division** acts as a secretary to the Projects Selection Committee.
⇓	
STEP 10	**NIRDA Project Selection Committee** uses scoring matrix to review Project Concept Notes and selects those for that can proceed to the next stage, submission of a detailed Project Application.
⇓	
STEP 11	**Operations and Programme Management Division** works with private enterprises to advise and support the formulation of detailed Project Applications.
⇓	
STEP 12	Applicants, with the support of the **Operations and Programme Management Division** submit Project Applications via the **NIRDA Projects Portal** by the due date.
⇓	

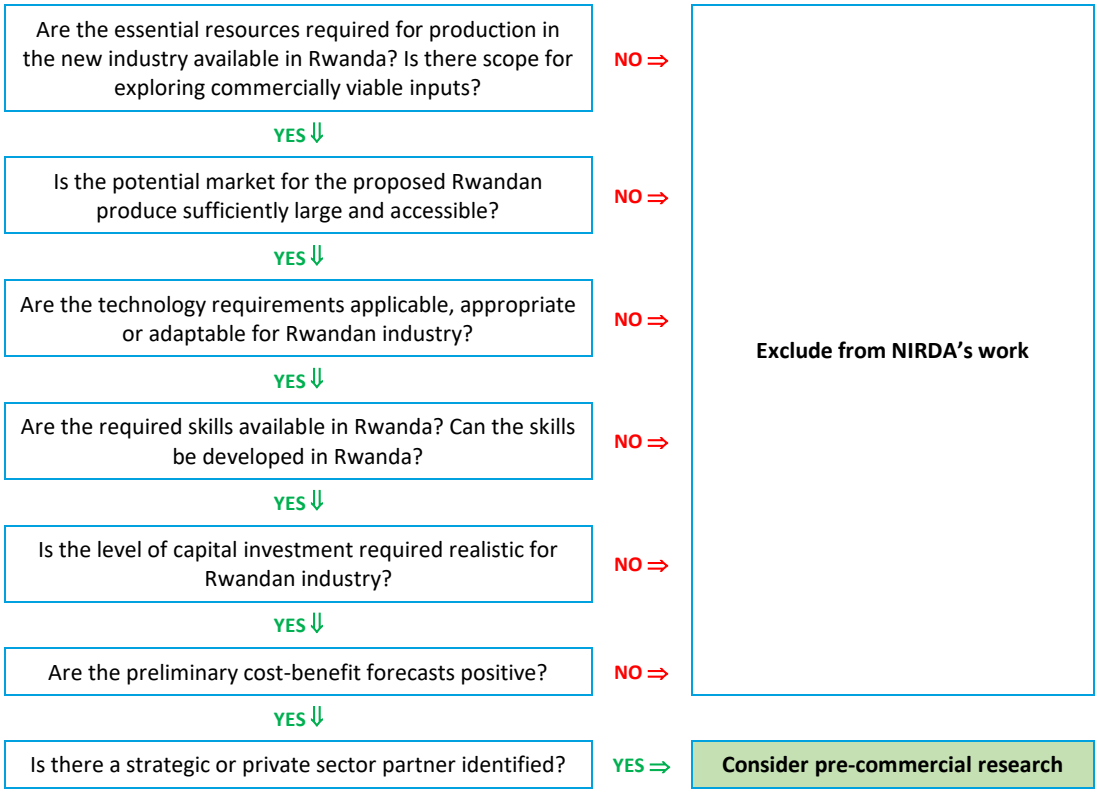
STEP 13	The **NIRDA Legal Services and Risk Mitigation Unit** assesses all Project Applications to ensure they are complete and meet all legal and quality compliance requirements before submission to the **Project Selection Committee**.
⇓	
STEP 14	**Project Selection Committee** assesses all Project Applications and makes recommendations to the **Board of Directors** on which applications should be accepted.
⇓	
STEP 15	**Board of Directors** considers the recommendations of the **Project Selection Committee** and approves final list of NIRDA projects.
⇓	
STEP 16	**Operations and Programme Management Division** prepares a Project Document for each selected project (i.e., based on Project Application and any revisions or refinements recommended by the Board of Directors).
⇓	
STEP 17	**NIRDA Legal Services and Risk Mitigation Unit** prepare contract based on Project Documents to be signed by both the Director General and the private sector partner.
⇓	
STEP 18	**Operations and Programme Management Division** coordinates the formation of Project Matrix Teams to implement the project and proposes a Project Team Leader, which the **Director General** must confirm.
⇓	
STEP 19	**Project Matrix Teams** implement the project.
	Project Matrix Team manage all aspects of the project in collaboration with the project partners. **NIRDA Operational Monitoring Division** monitors progress of project and achievement of targets and provides regular reports to the **Director General**, with a copy to the **Board of Directors.**
⇓	
STEP 20	**Operations and Programme Management Division** submits Final Project Report to the **Director General**.
⇓	
STEP 21	**Knowledge Management and Operational Monitoring Department** identifies lessons to learn from the project—from both successes and failures—and distributes this through the knowledge management and programme planning system.
⇓	
STEP 22	Replication: based on identifies lessons from the **Knowledge Management and Operational Monitoring Department**, the **Operations and Programme Management Division** prepares and submits to the **Director General** a replication and implementation plan, for approval.

5.3.3 Technology development

Whilst much of NIRDA's work will involve support to existing enterprises, there is a need for focused pre-commercial research in new sectors, sub-sectors and value chains to assess their scope for commercial development.

This requires a very thorough and careful selection process to ensure that scarce resources are not wasted on value chains where Rwanda has little prospect of success. See the figure below.

Figure 7: Matrix for selecting priority value chains where there is no existing industry



The selection process will identify areas in which NIRDA can undertake or commission:

- Pre-commercial exploratory applied research and development to develop an area of capability or a technology platform that is likely to lead to increased competitiveness or the opening of a new market opportunity.
- Further work to refine and exploit that knowledge in collaborative projects with industry.

The selection of intervention areas and of specific pre-commercial research will be undertaken by the Project Selection Committee based upon specific standardised proposals submitted by the Division Manager, Applied Research and Development.

Figure 8: Applied R&D projects workflow

<table>
<tr><td>STEP 1</td><td colspan="2">NIRDA Applied R&D Division identifies priority value chains and project opportunities.</td></tr>
<tr><td rowspan="4"></td><td>Applied R&D Division responds to Open Call (see NIRDA Projects Work Flow)</td><td>Applied R&D Division considers longlist of sectors, sub-sectors and value chains informed by Cabinet, MINICOM and National Council of Science and Technology.</td></tr>
<tr><td>Applied R&D Division works with private enterprise partner to submit a project through the Open Call process</td><td>Applied R&D Division undertakes or commissions a feasibility study of the selected priority value chains. The resulting report contains recommendations for future NIRDA actions.</td></tr>
<tr><td rowspan="2">NIRDA Project Process continues as outlined in the Project Work Flow. Project Concept Notes are submitted via the NIRDA Projects Portal by the due date (see Step 8).</td><td>Applied R&D Division submits feasibility analysis report to the Director General for approval.</td></tr>
<tr><td>Following approval by the Director General, the Applied R&D Division identifies a private sector partner to collaborate with and to begin preparing a Concept Note.</td></tr>
<tr><td colspan="3">⇓</td></tr>
<tr><td>STEP 2</td><td colspan="2">Applied R&D Division works with private sector partner to prepare a Project Concept Note, for submission to the Project Selection Committee
[These projects are not managed through the Open Call process and do not have a specified window or timeframe for submission and assessment. These projects are assessed on a case-by-case basis.]</td></tr>
<tr><td colspan="3">⇓</td></tr>
<tr><td>STEP 3</td><td colspan="2">Project Selection Committee approves or rejects Project Concept Note.</td></tr>
<tr><td colspan="3">⇓</td></tr>
<tr><td>STEP 4</td><td colspan="2">Where a Project Concept Note has been approved, the Applied R&D Division prepares a full Project Application in collaboration with identified project partners, including private sector partners. The Project Application is submitted, via the Director General, to the Board of Directors.</td></tr>
<tr><td colspan="3">⇓</td></tr>
<tr><td>STEP 5</td><td colspan="2">Board of Directors approves or rejects Project Applications.</td></tr>
<tr><td colspan="3">⇓</td></tr>
<tr><td>STEP 6</td><td colspan="2">Applied R&D Division prepares a Project Document for each selected project (i.e., based on Project Application and any revisions or refinements recommended by the Board of Directors). The Project Document is used as the basis for the contract between NIRDA and the project partners.</td></tr>
<tr><td colspan="3">⇓</td></tr>
</table>

STEP 7	**Applied R&D and Foresight Incubation Department** coordinates the formation of **Project Matrix Teams** to implement the project and confirms the Project Team Leader.

⇓

STEP 8	**Project Matrix Teams** implement the project,	
	Applied R&D and Foresight Incubation Department and the **Project Matrix Team** implement the project.	**NIRDA Operational Monitoring Division** monitors progress of project and achievement of targets and provides regular reports to the **Director General**, with a copy to the **Board of Directors.**

⇓

STEP 9	**Applied R&D Division** submits Final Project Report to the **Director General** with a copy to the **Board of Directors.**

⇓

STEP 10	**Knowledge Management and Operational Monitoring Department** identifies lessons to learn from the project—from both successes and failures—and distributes this through the knowledge management and programme planning system.

5.3.4 Technology foresight

Technology foresight employs a set of tools for anticipating the future needs, opportunities, uses, and threats of technologies in growing national, regional and global markets It anticipates multiple, plausible futures over a 10 to 20-year time horizon, rehearsing potential futures and accommodating uncertainty and diversity.

When starting to think about Rwanda's industrial future, NIRDA will examine datasets, conduct literature reviews, benchmark performance against that of other countries, regions, companies, etc., and elicit the views of experts and other commentators (e.g., through surveys, interviews, and expert panels). This information will be analysed, synthesised, and consolidated into a baseline report.

NIRDA will then extrapolate quantitative datasets and qualitative trends into the future and make use of cross-impact analysis to better understand the interactions between key trends and issues. Wild cards and anticipated discontinuities will be introduced at this stage to generate multiple views of the future (i.e., future scenarios). These may be informed by weak signal analysis, which in turn is dependent on some form of environmental scanning and issues management.

Where there is extensive uncertainty on future developments, as there is in much foresight work, methods such as Delphi, which rely upon the views of a cohort of experts, can be used to elicit expert judgement.

Extrapolation of futures is nearly always accompanied by normative approaches to thinking about the future. The focus here is on identifying and deliberating upon desirable futures. Common techniques include brainstorming, visioning exercises, creative imagery, scenarios, and futures workshops. Normative approaches tend to be more open to widespread participation, although by no means exclusively so. Attention to the visualization and

presentation of results is also especially important at this stage. Once anticipated or desirable futures have been visualised, realisation strategies will be developed using techniques such as back casting and technology road-mapping.

Foresight concentrates on emerging generic technologies where there is a legitimate case for government support. This is because companies are often unwilling to fund the strategic research that underpins emerging generic technologies. This means commencing with an area of interest identified through more generic research.

The overall process is summarised in the figure below.

Figure 9: Technology Foresight Process

What is the focus of this project?	Define the project topic so that it is clearly and succinctly described.
⇓	
What are the central questions that need to be answered?	Set the 'challenge questions". These are questions that allow you to begin to explore the future possibilities. They encourage imagination and creative thinking.
⇓	
What are the drivers of change in this area?	Identify the things that cause change, whether positive or negative.
⇓	
Where are the opportunities for innovation?	Think about the new products, services or business models that can be designed to help answer these questions. This should be based on an understanding and analysis of the value chain and a broad exploration of the possible interventions NIRDA can make.
⇓	
How viable is a future project in this area?	What human and financial resources are required to nurture this innovation?
⇓	
Do you have enough information to prepare a Concept Note?	Pull the information together and present a Concept Note that outlines a possible NIRDA project in this area.

NIRDA's Technology Foresight Division will establish a structure to manage the Technology Foresight process:

- A Technology Foresight Steering Committee that will approve the objectives, the focus, the methodology, the work programme, validate the strategy and tools for communication, and help to promote the results. It will define/adjust the assessment criteria and review the deliverables. It will monitor the quality assurance process for the whole project.
- A project team that will manage the project on a daily basis, with tasks such as:
    - Identifying, preparing job descriptions for and mobilising experts—national and international;
    - Nominating the membership of various expert panels;

  - Maintaining regular contacts with the stakeholders and the steering committee to ensure that the project direction is maintained;
  - Checking that the project maintains its technical objectives; and
  - Ensuring that the project maintains its relevance to wider activities, initiatives and policies.
- Expert panels and working groups. Expert work is highly significant in terms of:
  - Gathering of relevant information and knowledge;
  - Stimulation of new insights and creative views and strategies for the future, as well as new networks;
  - Diffusion of the foresight process and results to much wider constituencies; and
  - Overall impact of foresight in terms of follow-up action.

The workflow for technology foresight and incubation projects is presented in the figure below.

Figure 10: Technology foresight and incubation project workflow

STEP 1	**NIRDA Foresight Incubation Division** identifies other new industry sectors, sub-sectors or value chains based on international research and technology forecasting.
⇓	
STEP 2	**Applied Foresight Incubation Department** prepares a Concept Note showing budget estimates and institutional or private sector partner proposed, and submits to the **Director General** for approval.
⇓	
STEP 3	**Director General** approves the Concept Note for implementation as a NIRDA project.
⇓	
STEP 4	**NIRDA Operational Monitoring Division** monitors progress of project and achievement of targets.
⇓	
STEP 5	**Operations Monitoring Division** submits regular project reports to the **Director General**, copied to the **Board of Directors.**

5.4 Cross-cutting concerns

Across all its programmes, projects and interventions, NIRDA is particularly concerned with its impact on gender and the environment.

5.4.1 Gender

NIRDA has adopted Gender Guidelines that describe its approach to promoting gender equality and equity in Rwanda through a clearly defined process for mainstreaming gender needs and addressing specific gender concerns across all business and industrial sectors. See the SOP Manual.

NIRDA pursues gender equality and equity through:

- **Gender mainstreaming:** integrating gender issues into the Agency's policies, programmes, activities, projects, and budgets;

- **Affirmative action:** correcting gender imbalances in Agency employment as well as in programme and project design and execution—this includes promoting equal participation and representation of women as agents of exchange in economic and social processes as an essential ingredient to achieving gender equality and equity.
- **Institutional capacity development:** building the capacity of all Agency structures and partners to monitor gender participation and design, implement and report on interventions to redress gender imbalances.

A Gender Advocate is appointed to coordinate and report on activities related to the NIRDA Gender Guidelines.

In addition, NIRDA's approach to gender equity is achieved through:

- Gender sensitive data collection, monitoring and reporting
- Value chain assessments and project design
- Assessing project impacts
- NIRDA's budget submissions; and
- Programming for women.

Across this work, NIRDA will develop specific targets for gender equality and equity. The Gender Advocate will prepare these, for approval by the Director General and the Board of Directors.

5.4.2 Environmental impact

NIRDA has adopted Environmental Guidelines that describe its approach to upholding sound environmental principles. NIRDA commits to mitigating the potential negative impact of its activities on the environment. It assesses projects that may have an environmental impact as part of the due diligence in project selection and appraisal and complies with applicable environmental legislation and regulations where necessary to implement its commitments to the environment. Furthermore, NIRDA promotes green technology and sustainable economic development through innovation. See the SOP Manual.

An Environmental Impact Advocate is appointed to coordinate and report on activities related to the NIRDA Environment Guidelines.

In addition, NIRDA's approach to the environment includes careful assessment and mitigation of project risks and specific efforts to promote sustainable economic development and green technologies.

6 Managing and monitoring for results

The overall theory of change and results chain for NIRDA have been defined for NIRDA the indicators of success identified.

The articulation of the results chain is part of the credible measurement of performance of NIRDA (and the work on each value chain). The results chain will be integrated with the results measurement plan which has already been designed.

NIRDA will prepare a Results Measurement Plan (RMP) for each project. The RMP guides the process of collecting information at all levels from the result chain (from activities, to the outputs, outcome and impact). The RMP will include the following information:

- Change level (Impact, outcome, output, activity).
- A reference to the boxes in the project result chain. This is simply the text used in the relevant box in the result chain.
- Indicators corresponding to each box in the result chain with the reference period for the measure specified.
- Baseline data for the indicators.
- Target by end of the project for the indicators.
- A description of how the data on indicators will be collected (data collection tools).
- Identification of the source of data.
- A timeline for when it will be collected.

An outline is shown in the following table.

Figure 11: A Results Measurement Plan

Change level	Box # in the results chain	Indicator	Baseline data	Target for the end of the project	Data collection tools	Source of data	When and Frequency

Data to populate the RMP will come from the project monitoring system based on data collection for each indicator using a table (prepared in MS Excel) (see an example in the following table).

Figure 12: Monitoring Data Collection Form

Level in the Result chain	Indicator	Baseline data	Performance data collected	Date	Responsible person	Source/ data collection method

The forms will be completed using a range of data sources (NIRDA's own records, MINICOM data, Key informant interviews, Desk review of secondary data, In-depth interviews and some focus group discussions where appropriate).

Data will be collected in a centralised MS-Excel centralised online system for collecting and managing monitoring data obtained at project level and drawing impact level data from this for the overall NIRDA portfolio. The process of measuring results should be integrated into all aspects of NIRDA programme management, from design through implementation to M&E. Indeed, the achievement of results should drive everything that NIRDA staff do, orienting their efforts and guiding their decisions.

Given the limited number of projects which NIRDA is likely to implement, that basing the project monitoring system on MS Excel will be the most cost effective and pragmatic solution.

Each project will have a monitoring framework which will comprise the following, on different Excel spreadsheets:

- Basic project information;
- Result chain with supporting notes;
- Results Measurement Plan; and
- Project Monitoring Report Data cumulated onto a single spreadsheet to demonstrate progress.

Impact data (i.e., employment, income, etc.) will be cumulated on a single Excel spreadsheet with input linked to each project's recoding system spreadsheet. This system has already been designed using MS-Excel.

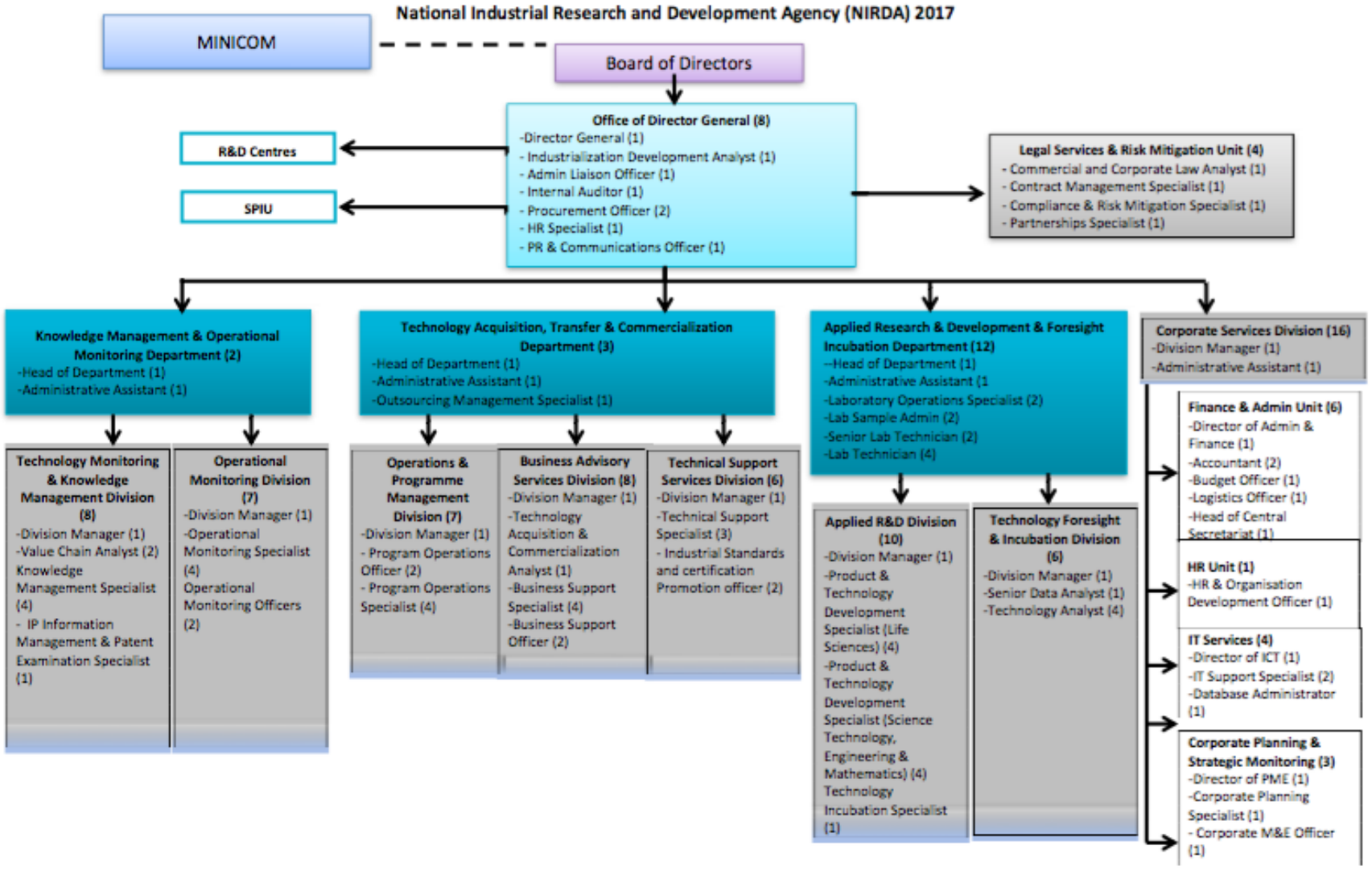
To ensure the monitoring system is smoothly linked into MINICOM's Management Information System, NIRDA will partner with MINICOM to open a 'window' in its internal Management Information System, which is password-based, to allow NIRDA to report periodically on the achievement of its Key Performance Indicators. This will allow both MINICOM and NIRDA to assess easily show the latter's contribution to MINICOM's Key Performance Indicators.

NIRDA's monitoring staff will undertake the following tasks:

- Prepare results chains, define indicators, establish baselines and targets, and all other preliminary monitoring actions for all NIRDA projects;
- Undertake regular monitoring of each projects results measurement plan and report accordingly;
- Review the results chains at least once a year and prepare evidence to justify changes or lack of changes made to results chains;
- Analyse monitoring data at both a project level and a portfolio; and
- Prepare a regular portfolio report on the impact of NIRDA.

Definition of baselines and targets for those indicators is dependent on the formal notification of the six value chains by the Government (still awaited), the technological audit that will identify NIRDA's intervention areas and defining the results chain for each selected value chain and its contribution to NIRDA's indicators. These will therefore be defined in the separate Action Plan.

Annex 1: NIRDA Organigram


National Industrial Research and Development Agency (NIRDA) 2017
MINICOM
Board of Directors
Office of Director General (8)
-Director General (1)
- Industrialization Development Analyst (1)
- Admin Liaison Officer (1)
- Internal Auditor (1)
- Procurement Officer (2)
- HR Specialist (1)
- PR & Communications Officer (1)
R&D Centres
SPIU
Legal Services & Risk Mitigation Unit (4)
- Commercial and Corporate Law Analyst (1)
- Contract Management Specialist (1)
- Compliance & Risk Mitigation Specialist (1)
- Partnerships Specialist (1)
Knowledge Management & Operational Monitoring Department (2)
-Head of Department (1)
-Administrative Assistant (1)
Technology Acquisition, Transfer & Commercialization Department (3)
-Head of Department (1)
-Administrative Assistant (1)
-Outsourcing Management Specialist (1)
Applied Research & Development & Foresight Incubation Department (12)
--Head of Department (1)
-Administrative Assistant (1
-Laboratory Operations Specialist (2)
-Lab Sample Admin (2)
-Senior Lab Technician (2)
-Lab Technician (4)
Corporate Services Division (16)
-Division Manager (1)
-Administrative Assistant (1)
Technology Monitoring & Knowledge Management Division (8)
-Division Manager (1)
-Value Chain Analyst (2)
Knowledge Management Specialist (4)
- IP Information Management & Patent Examination Specialist (1)
Operational Monitoring Division (7)
-Division Manager (1)
-Operational Monitoring Specialist (4)
Operational Monitoring Officers (2)
Operations & Programme Management Division (7)
-Division Manager (1)
- Program Operations Officer (2)
- Program Operations Specialist (4)
Business Advisory Services Division (8)
-Division Manager (1)
-Technology Acquisition & Commercialization Analyst (1)
-Business Support Specialist (4)
-Business Support Officer (2)
Technical Support Services Division (6)
-Division Manager (1)
-Technical Support Specialist (3)
- Industrial Standards and certification Promotion officer (2)
Applied R&D Division (10)
-Division Manager (1)
-Product & Technology Development Specialist (Life Sciences) (4)
-Product & Technology Development Specialist (Science Technology, Engineering & Mathematics) (4)
Technology Incubation Specialist (1)
Technology Foresight & Incubation Division (6)
-Division Manager (1)
-Senior Data Analyst (1)
-Technology Analyst (4)
Finance & Admin Unit (6)
-Director of Admin & Finance (1)
-Accountant (2)
-Budget Officer (1)
-Logistics Officer (1)
-Head of Central Secretariat (1)
HR Unit (1)
-HR & Organisation Development Officer (1)
IT Services (4)
-Director of ICT (1)
-IT Support Specialist (2)
-Database Administrator (1)
Corporate Planning & Strategic Monitoring (3)
-Director of PME (1)
-Corporate Planning Specialist (1)
- Corporate M&E Officer (1)

Annex 2: NIRDA departments, divisions and other operational structures

<table>
<tr><th colspan="2">KNOWLEDGE MANAGEMENT AND OPERATIONAL MONITORING DEPARTMENT</th></tr>
<tr><td colspan="2">• Knowledge management across the Agency and with external stakeholders;
• Monitoring and evaluation of all NIRDA projects at the operational level.
The Head of this department reports directly to the Director General.</td></tr>
<tr><th>TECHNOLOGY MONITORING AND KNOWLEDGE MANAGEMENT DIVISION</th><th>OPERATIONAL MONITORING DIVISION</th></tr>
<tr><td>MANDATE
1. Monitor technology developments within the regional and globally and conduct sector-wide analysis
2. Prioritise value chains for future NIRDA action
3. Undertake technology audits of selected value chains
4. Design NIRDA support programmes to address issues identified through the audits
5. Act as an online knowledge repository
6. Publications and Knowledge sharing – internally & externally
7. Patent examination
8. IP information management</td><td>MANDATE
1. Define indicators of success for proposals/projects
2. Undertake monitoring of proposals/projects
3. Identify both successful and failing projects and the reasons for each
4. Provide monitoring data to technology transfer team to encourage replication of success</td></tr>
</table>

TECHNOLOGY ACQUISITION, TRANSFER AND COMMERCIALISATION DEPARTMENT		
OPERATIONS AND PROGRAMME MANAGEMENT DIVISION	**BUSINESS ADVISORY SERVICES DIVISION**	**TECHNICAL SUPPORT SERVICES DIVISION**
MANDATE 1. Management of NIRDA's support programmes Including those for technology acquisition and absorption 2. 'Open Call' management and administration (including Help Desk) 3. Assess commercial, managerial and technical viability of all proposals for NIRDA support 4. Commissioning of external technical assessment for proposals 5. Secretariat to Projects Selection Committee 6. Supporting replication of successful pilot to achieve impact at scale 7. Provision of project managers for Project Matrix Teams	MANDATE 1. Advisory services on commercialisation 2. Enterprise management and capacity development 3. Business planning and analysis 4. Sales and marketing 5. Distribution and logistics 6. Intellectual property issues 7. Access to finance facilitation 8. Regulatory burdens 9. Market research and dissemination of market information	MANDATE Advisory services on: 1. Cleaner production and energy efficiency 2. Process engineering and efficient production 3. Packaging design 4. Quality assurance, certification and compliance 5. Specialised consultancy management

<table>
<tr><th colspan="2">APPLIED RESEARCH AND DEVELOPMENT AND TECHNOLOGY FORESIGHT DEPARTMENT</th></tr>
<tr><th>APPLIED RESEARCH AND DEVELOPMENT DIVISION</th><th>TECHNOLOGY FORESIGHT INCUBATION DIVISION</th></tr>
<tr><td>MANDATE
1. Undertake or commission pre-commercial exploratory applied research and development to develop an area of capability or a technology platform that is likely to lead to increased competitiveness or the opening of a new market opportunity.
2. Provision of laboratory testing and development services to the private sector
3. Provision of technology incubation facilities to test viability of pre-commercial concepts
4. Adaptation of technologies and prototyping
5. Develop new products and processes for value addition in close partnership with industry</td><td>MANDATE
Manage an extremely high-powered group of ‘thinkers’ from industry, academia and government to:
1. Identify emerging generic technologies relevant to yield the greatest economic and social benefits to Rwanda in the future
2. Provide innovation laboratories for testing and prototyping new technology for future industries
3. Undertake collaborative projects with frontier industry technology providers
4. Build networks and promote innovations for future industries</td></tr>
</table>

FINANCE AND ADMINISTRATION	HUMAN RESOURCE AND ORGANISATIONAL DEVELOPMENT	IT SERVICES	CORPORATE PLANNING AND STRATEGIC MONITORING
MANDATE 1. Financial management and control 2. Definition and oversight of standard operating procedures 3. Facility and asset management	MANDATE 1. Human Resource Planning and management 2. Organisational development 3. Definition and oversight of HR standard operating procedures 4. Human resource development	MANDATE 1. Installation and management of computer and communication systems 2. Network and software Administration 3. Website management 4. Data management 5. Technical support	MANDATE 1. Updating NIRDA strategic plan 2. Preparing NIRDA's medium-term expenditure framework 3. Preparing NIRDA's single action plan 4. Monitor, evaluate and report on the implementation of NIRDA's strategic and implementation plans.

Annex 3: Logical Framework Matrix

Goal: Increased domestic production for local consumption and improved export competitiveness		**Increase in exports/decrease in imports**
Key Pillar 1: Institutional capacity development	**Outcome 1: NIRDA has the institutional capability and capacity to implement the NIRDA Strategic Plan 2017-2021**	Achievement of all underpinning outputs
	Output 1.1: New organisational structure approved	Prime Ministerial Order setting new structure
	Output 1.2: Development of job description for all NIRDA staff and an assessment of their training needs to undertake their new roles competently	Existence of new JDs for all staff
	Output 1.3: Recruitment of staff to fill new posts as and when necessary	All posts within new organisational structure filled in accordance with recruitment plan
	Output 1.4: Implementation of a comprehensive training programme for NIRDA staff	Training programme implementation report
	Output 1.5: Development of all necessary internal systems and procedures based on an approved workflow process	Procedures manual documenting all steps in workflow process
	Output 1.6: Procurement of essential operating infrastructure/equipment.	All essential equipment installed and operational
Key Pillar 2: Technology Monitoring, acquisition and knowledge sharing	**Outcome 2 Pilot enterprises in selected value chains acquire intellectual property rights (IPR) for technologies to improve their competitiveness**	Number of operational pilot projects
	Output 2.1: Technology audits completed on all selected value chains	Number of technology audits completed
	Output 2.2: Awareness raising programme of technology acquisition opportunities in each value chain	Awareness programme implemented in accordance with plan
	Output 2.3: Open call for project concepts/full applications for IPR acquisition for each value chain	Number of project concepts/full applications submitted
	Output 2.4: Pilot projects selected under each open call	Number of pilot projects selected from each value chain
	Output 2.5: NIRDA supports acquisition of IPR in accordance with agreed memorandum of understanding	Number of intellectual property rights acquired in selected value chains
	Output 2.6: NIRDA monitors pilot projects to determine effectiveness of acquired IPR	Project Monitoring Report exists for each supported project
	Output 2.7: Knowledge management/sharing programme implemented	Knowledge management systems operational within NIRDA

	Outcome 3 Replication by a large number of enterprises of the actions of pilot enterprises which increased their competitiveness through the use of acquired IPRs	Number of companies replicating the IPR acquisition
	Output 3.1: Awareness raising/practical demonstration programme to demonstrate effectiveness of pilot projects	Awareness programme implemented in accordance with plan
Key Pillar 3: Technology development and transfer	**Outcome 4: Pilot enterprises in selected value chains are supported by NIRDA to improve their competitiveness through the development and use of appropriate technologies**	Number of pilot enterprises
	Output 4.1 Awareness raising programme of technology development/transfer opportunities in each value chain	Awareness programme implemented in accordance with plan
	Output 4.2: Open call for project concepts/full applications for technology development/transfer for each value chain	Number of project concepts/full applications submitted
	Output 4.3: Pilot projects selected under each open call	Number of pilot projects selected from each value chain
	Output 4.4: NIRDA provides technical support for technology development/transfer in accordance with agreed memorandum of understanding	Number of technology development/transfer projects implemented
	Output 4.5: NIRDA monitors pilot projects to determine effectiveness of technology development/transfer	Project Monitoring Report exists for each supported project
	Outcome 5: Replication by a large number of enterprises of the actions of pilot enterprises which increased their competitiveness through the development and use of appropriate technologies	Number of companies replicating the technology development programme
	Output 5.1: Awareness raising/practical demonstration programme to demonstrate effectiveness of pilot projects	Awareness programme implemented in accordance with plan
Key Pillar 4: Business development services to support Industries	**Outcome 6: High number of applications for NIRDA support (in technology acquisition, development or transfer) from enterprises in the selected value chains**	Number of fully compliant applications/ concept notes
	Output 6.1: Technology Acquisition, Commercialisation and Transfer Department (including Help Desk) within NIRDA established	Technology Acquisition, Commercialisation and Transfer Department established
	Output 6.2: Business development services (IPR advice, marketing, business planning, etc.) being provided to potential and actual applicants for NIRDA support by the Technology Acquisition, Commercialisation and Transfer Department	Customer satisfaction survey