



# Industrial Research and Consultancy Center

## 2020-2022 Strategy:

### Structural Reform and Strategic Positioning

(English Summary)

November 2020

An exceptional strategy for exceptional times, for IRCC to regain its role as a facilitator of industrial development in Sudan.

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## Contents

Background, status quo and future prospective .....	3
Strategy overview.....	4
Operational work plan.....	5
Structural reform.....	5
Institutes.....	8
Strategic positioning initiatives .....	9
External relations and partnerships .....	9
Challenges and opportunities.....	10
Detailed workplan with measurable outputs.....	11
Ahead and beyond .....	14

## Background, status quo and future prospective

The Industrial Research and Consultancy Center (IRCC), Sudan, was established in 1965 with the assistance of UNIDO (United Nations Industrial Development Organization) as a national noncommercial R&D and consultancy center. The center conducts research and provides consultancy services to the private and public industrial sectors in Sudan focusing on efficient utilization of material and resources. IRCC is governed by the IRCC Act of 1981 which provides the center financial and organizational independence as a parastatal organization, although it is known as the *technical arm of the Ministry of Industry* due to the fact that it is directly connected to the Minister of Industry. IRCC is therefore the technical arm of the State of Sudan in the industrial field and in industrial development overall.

IRCC aims to contribute to the development of the industrial sector in Sudan by utilizing scientific knowledge to link research policies and organizational objectives leading to the realization of national development programs, providing alternatives for imports and increasing exports. Accordingly, IRCC's scope was defined in the 1981 act as follows:

- R&D on local material as industrial inputs.
- Design and engineering of small industries and related technology localization activities.
- Technical feasibility studies for the private and public sector.
- Provide consultancy services in industrial design, engineering process production management, costing, management systems, quality assurance and product development.
- Contribute to creating national industrial development programs and plans.
- Contribute to standardization of local industries.
- Establish a national knowledge center and participate in effective networking with similar institutions.
- Raise awareness regarding matters related to the industrial field.

### **The Vision**

*To efficiently and actively contribute to the wellbeing of the Sudanese people as a scientific institution through technology development and localization, thereby increasing the productivity and competitiveness of the Sudanese industry regionally and internationally via effective collaboration with partners and stakeholders.*

### **The Mission**

*To effectively conduct research and consultation activities to achieve higher utilization of national resources, increase added value and industrial quality, as well as design innovative high-quality products to achieve higher competitiveness of products and national consultation services.*

Current activities taking place at the IRCC include:

- Conducting scientific (applied) research and R&D;
- Providing consultancy services in various fields of industrial development;
- Raising awareness and providing knowledge in the field of industrial development (publications, conferences and seminars);
- Trainings targeting industry, students and young graduates; and
- Providing testing and analysis service for industrial materials and commodities, as per industry request and for accreditation by the Sudanese Standards and Metrology Organization (SSMO).

Laying clear strategies, investing in R&D and increasing national capacity with regards to technology have been main pillars in the success of any country that managed to achieve significant industrial development (say

within the last four decades, , for comparative reasons). Research and Technology Organization (RTOs) play a significant role in national industrial systems (as well as national innovation systems) as they connect the 'triple helix' of the state, private sector and academia and help in improving their collective contribution towards sustainable industrial development.

Accordingly, investing in RTOs becomes a developmental necessity for countries aiming to achieve sustainable development.

Today, IRCC is faced with the opportunity to reestablish its rightful position within the aforementioned triple helix thereby providing significant added value to industrial development efforts in Sudan. This requires both structural reform activities as well as strategic positioning activities; both of which represent the main pillars of the IRCC's strategic plan for the 2020 – 2022 period (aka strategy 20-22).

## Strategy overview

Taking into consideration the background and status quo, as well as the vision and future perspectives of IRCC, the center's management initiated a strategy-building process since June 2020. It began with providing a short proposal and suggestions to be discussed within the IRCC (personnel and units) as well as with the Minister of Industry and other stakeholders. Since then, it grew with further internal and external consultation, review and iteration, until a draft was submitted to the newly-formed board of directors of IRCC; and after review and modifications the board approved the IRCC Strategy 20-22.

Since its beginning; the strategy-building process was envisioned by the IRCC management as a brainstorming process, one that must involve several actors within and outside IRCC. That was due to a clear understanding that no plan can be successfully implemented without the commitment of those responsible of its realization, and that real commitment requires a level of sufficient consensus which can only be realized via effective communication and coordination of ideas, proposals, suggestions and initiatives.

The output of this process showed an agreement between most external and internal actors regarding the center's dire need for reform and investment activities, better phrased as: **Structural reform** with regards to the center's internal issues including 3 defined priorities, and **Strategic positioning** with regards to activities and external relations including 4 defined priorities, in addition to an 8th priority defined separately and focusing on restoring relations with the IRCC partners locally, regionally and internationally. These priorities are highlighted in figure 1.

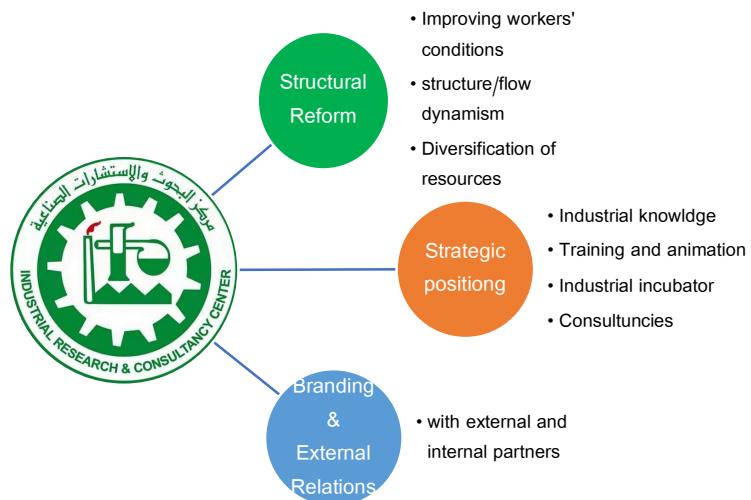


Figure 1: Structural reform and strategic positioning priorities.

## Operational work plan

The implementation of the center's *upgrading* activities and the realization of its structural reform and strategic positioning priorities is expected to take place in **3 phases** with a total duration of a **2 years (24 months)** long operational work plan.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Phase 1																								
Phase 2																								
Phase 3																								branding & reporting

### Phase 1 (8 months)

This phase includes a wide range of consultations and internal dialogue to **attain consensus leading towards starting the structural reform activities**. The first months of this phase will focus on enabling dialogue by collecting proposals, engaging in discussions and providing suitable platforms to achieve the best possible outcomes and correctly reflect outputs in the final version of the center's strategy. Once the strategy is approved a good portion of this phase will be completed. This phase has already begun. This will be followed by **implementing the priorities of structural reform** depending on the availability of resources and the defined order of priorities.

### Phase 2 (14 months)

This phase focuses of **strategic positioning** while finalizing structural reform activities. With regards to industrial information/knowledge -taken as an example- this phase will include serious efforts dedicated for the collection of industrial data and information which will then be published in suitable platforms. This phase will also include an upgrade of the IRCC's website and general online presence, upgrading the center's library to accommodate researchers from and outside the IRCC, as well as connecting the center's database to other related research centers and educational institutions. Similar efforts will also take place regarding other strategic positioning priorities. The product of this phase is a number of tangible outputs and contributions to the defined fields and priorities.

### Phase 3 (6 months)

This phase can be titled the **external relations, branding and reporting** phase, during which the outputs and products of the previous 2 phases are collected, documented and presented to stakeholders. During this phase the center will reach out to stakeholders to provide reports of the then implemented structural reform and strategic positioning plan as well as ongoing activities, the center's new structure, priorities, quality management systems, along with an internal evaluation of IRCC's implemented and planned activities. The products of this phase will also include reporting on for the status of flagship projects with the new strategy.

## Structural reform

The following paragraphs further detail the structural reform priorities and intended outcome which were defined via a process of brainstorming and consultative meetings within IRCC. During this process shortcuts of the current organizational structure were defined pointing out a need for a restructuring process to achieve improved **structure and flow**.

Further research showed that current structures of large institutions are mostly pyramid-shaped. However, this has been changing the last years, especially in institutions and organizations of innovative and competitive nature. To overcome the flaws of pyramid-shaped structures, alterative structures have been developed and

implemented, renowned examples of which are horizontal and matrix-shaped structures. Both these alternative structures were used in designing the new IRCC organizational structure.

This new organizational structure for the IRCC is a flat, horizontal and circular structure, i.e. non-linear and not pyramid-shaped. Such structure shall provide all units with adequate proximity in status and decision making as well as proximity to the director general (DG). The new structure will also improve communication and coordination between the different units, minimizing the need for interventions by the DG while at the same time providing easy access to the DG when required and beneficial.

The units of this structure are institutes, departments, offices and director general demonstrated in figure 2.

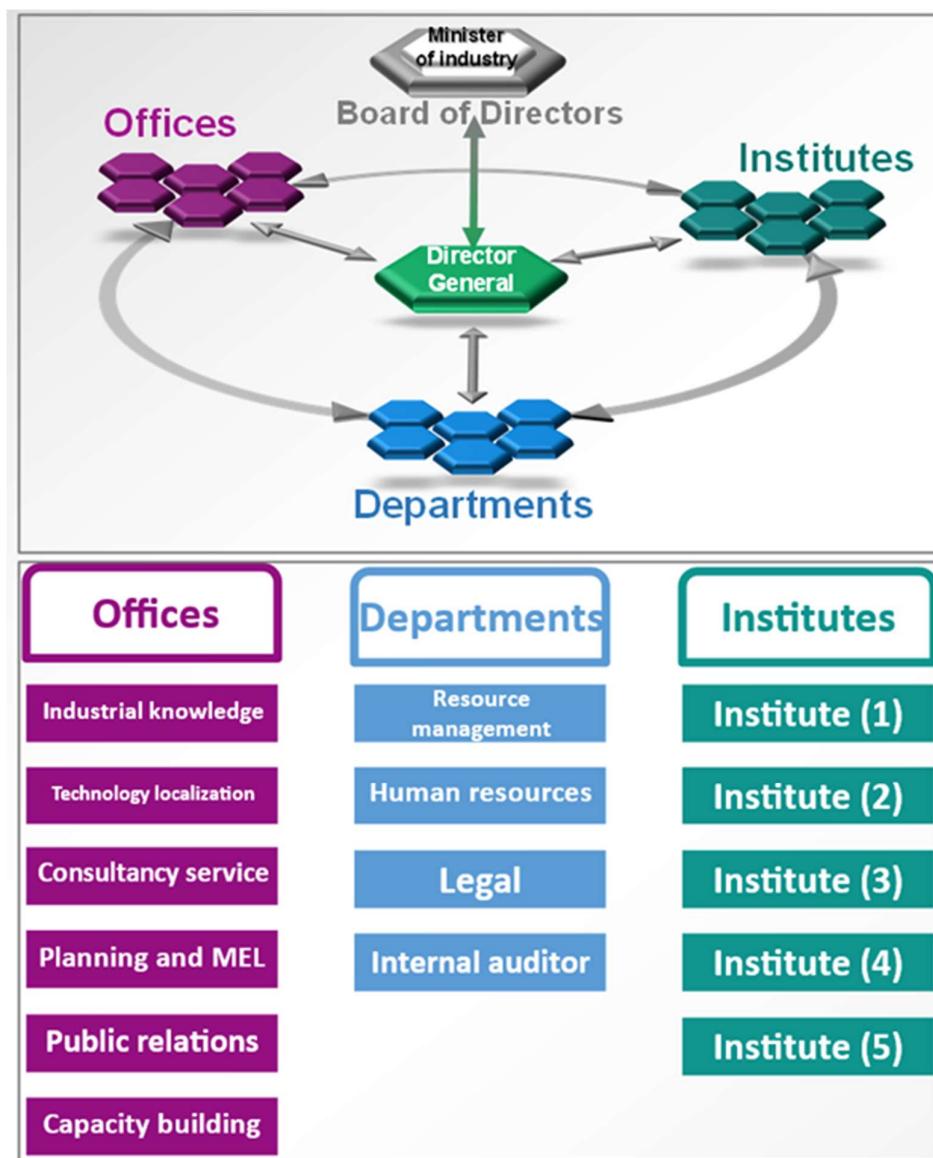


Figure 2: IRCC's modified general managerial structure

**Institutes** are of technical and innovative nature. Being IRCC's research, consultancy and innovative knowledge base, institutes can be considered the engine of the IRCC machine. Institutes are assigned the responsibility of providing and organizing the center's core staff.

**Offices** are responsible for coordination and documentation. They are the display channels and tools of the center's products and outputs, most of which are produced by the institutes. Within the center's machine -where institutes are its engine- these offices can be considered the center's drive arms, wheels, lights and display boards. The offices are the units through which the center's outputs are displayed.

**Departments**, with defined administrative tasks responsible for providing the resource and environment required by the center. The center's departments are also responsible of ensuring compliance with external regulations as well as implementing internal ones.

**The general directorate** - provides strategic supervision and quality assurance. It works as a coordination unit between the aforementioned units and an external representer of the center reflecting its objectives and interests. This unit includes the IRCC director, deputy director, executive office and the center's temporary councils and committees.

This circular/flat organizational structure shall provide all units with the autonomy required to dynamically manage their activities. This approach is inspired by the experience of research and innovation institutions around the world, where it is found that - more than vertical top-to-bottom definition of tasks and responsibilities – a dynamic environment where units function with autonomy nurtures and generates innovation and solutions.

While providing IRCC units with autonomy, this structure also gives them bigger responsibilities, thereby offering every the center's staff the opportunity to assume managerial and decision-making responsibilities. Tasks and responsibilities are defined by a three-dimensional matrix structure of institutes, offices and programs.

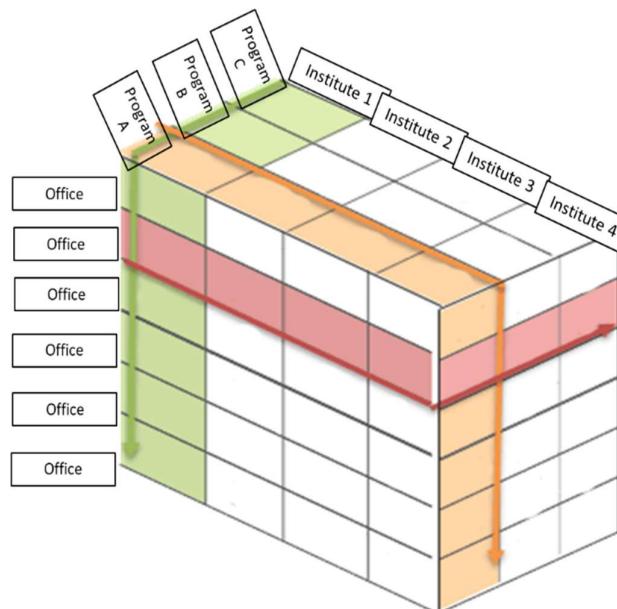


Figure: a 3-dimentional matrix structure for tasks and responsibilities

## Institutes

The process of defining and detailing the institutes within the center included studying various proposals, discussions and consultations with the current heads of departments and institutes, in addition to the creation of a committee responsible of naming the institutes. Accordingly, **five institutes** were defined by this process and each institute will include several programs. In addition to the institutes a number of special units and joint programs operate within the IRCC's structure.

### **Institute for Industrial Policy Studies (IPS)**

Improving and developing the field of industrial policies as an evidence-based, methodological, and informative scientific field is currently a necessity for the Sudanese industry. In the general map of public service institutions in Sudan, there is no place better equipped to accommodate an institute for industrial policies than the IRCC.

The Institute for industrial policy studies (IPS) will be a new addition to the IRCC's structure and will therefore undergo an establishing process derived from the center's previous experience in policy studies yet framed for the new field. IRCC will present the IPS as one of its newest accomplishments and spearheads during the branding phase.

During its first phase the IPS shall include programs that include: value chains of strategic sectors; competitiveness policies (e.g. support for emerging industries); foresight & future studies; industrial cooperatives and STI (science, technology and innovation) policies, among others.

### **Institute for Extractive Industries (IfEN)**

The programs in this institute shall reflect the current priorities of the field of extractive industries as well as the center's expertise (e.g., addressing the environmental impacts of mining processes). Proposed programs for IfEN include: petrochemicals; improving artisanal gold mining, and construction materials, among others.

### **Institute of Agro-Industries (IfAN)**

This institute will include agro-industrial complexes programs; as it will analyze, develop and design new industrial complexes with multiple services and products with inter-connected and interdependent value chains. For example, the dairy, meat and leather industries share an agro-industrial complex with interconnected supply chains, products and markets.

Textile industries shall be included in the new structure either as a program in the IfAN or the EDMI (below).

### **Engineering Design and Manufacturing Institute (EDMI)**

The scope of this institute includes all research activities related to industrial engineering, including chemical engineering, mechanical engineering , process engineering and industrial design. The programs in the EDMI include important sectors of the Sudanese industry such as polymers, pharmaceuticals, as well as operational efficiency and development of traditional industries.

### **National Leather Technologies Center (NLTC)**

Due to the strategic importance of leather industries in Sudan; a separate institute was dedicated to the field. The modified structure will not change this.

### **Special Units and Joint Programs**

- UNESCO Chair on Transfer of Technology (hosted by IRCC)
- The Industrial Incubator (to be established)

- The National Cleaner Production Center (to be hosted by IRCC)
- Other joint programs

## Strategic positioning initiatives

The following paragraphs summarize ongoing and planned strategic positioning activities and initiatives.

### **Industrial information and Online presence**

Industrial information is a valuable modern “commodity” and one of the main products of research centers, accordingly, establishing IRCC as a knowledge base in Sudan was defined as one of the center’s strategic priorities. This knowledge base is expected to serve multiple stakeholders within Sudan including decision makers, public institutions, business owners, industrial development organizations, as well as researchers and students in industrial fields.

Accordingly, the center has begun establishing its online presence via a new website, as well as training IRCC staff to manage online presence and content. An important part of the IRCC’s website is its online library which will include, in addition to the center’s publications and those of the IRCC’s researchers, a wide variety of literature on industrial knowledge (books, studies, surveys, scientific journals, etc.). The library will also provide free or partial access to international online libraries.

### **Review and rebranding of consultancy services**

This initiative aims toward re-organizing the process related to the consultancy services provided by the IRCC as well as rebranding it to relevant markets as the second half of the center’s scope of work (research and consultancy). This initiative shall serve diversifying the center’s resources, which was defined as a strategic positioning priority.

### **Training and development programs**

During the strategy 20-22 period IRCC will work on reestablishing and strengthening its training and development activities, including communication with universities and vocational training institutes. This will include curriculum development for basic regular training courses, which will be advertised and promoted and will reward successful participants with credible certifications. These training programs will target professionals and managers in the industrial field as well as the industrial policy field, in addition to researchers and students of industrial development and related fields.

## External relations and partnerships

Strengthening and enhancing external relations and partnerships is a priority of IRCC that will be mostly highlighted during the institutional branding and external relations phase, before which the center will need to foster the necessary measurable outputs in structural reform and strategic positioning to represent itself to stakeholders and potential partners.

However, we have already took several steps towards restoring relations with partners and stakeholders, such as IRCC meeting with the UNIDO office in Sudan, and with the Sudanese Higher Council for the Environment and Natural Resources, as well as IRCC’s strong relation with the Sudanese Standards and Meteorology Organization (SSMO) and the continuous improvement in the relations between IRCC and the Ministry of Industry and Trade.

IRCC will produce introductory online and print publications about its role and services to be disseminated to stakeholders and will also aim to utilize media and advertisement tools to highlight its strengths and potentials.

## Challenges and opportunities

The biggest opportunities for this strategy are due to the transitional nature of the current period in Sudan, these opportunities include:

- Big changes, interest in comprehensive review and appetite for experimentation;
- Research centers are open towards partnerships and diversification of resources; and
- Accordingly, such an exceptional strategy, though ambitious, resembles and reflects the transitional period hosting it.

At the same time several big challenges face the implementation of this strategy due -as well- to the nature of the transitional period, these include:

- Change resistance and inherited traits;
- Lack of resources; and
- Low interest in the industrial field and in investment in industrial research and consultations.

Accordingly, IRCC must maximize the potential made possible by the present opportunities while carefully managing and overcoming the challenges.

## Detailed workplan with measurable outputs

Strategic Workplan 20 - 22											
Objective	Time Period (in year quarters)								Implementation tools & activities	Measurable outputs	Notes
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8			
Structural Reform	Improving workers' conditions								<ul style="list-style-type: none"> <li>- Consensus building (via meetings, reviews, discussing proposals);</li> <li>- Forming special committees to review promotions and exceptional complaints;</li> <li>- Review of internal regulations;</li> <li>- The right to information and the right to organize</li> <li>- Support staff initiatives</li> <li>- Full review of employee recruitment and promotion policies and regulations and approving the new amended policies.</li> </ul>	<ul style="list-style-type: none"> <li>* Implementing the modified organizational structure as well as the regulations of the new units and defining their key performance indicators (KPIs) and monitoring, evaluation and learning (MEL) indicators.</li> <li>* Implementing institutional changes related to working conditions.</li> <li>* Establishing the Institute for Industrial Policy Studies (IPS) and initiating its activities, including: a project, a conference, a training course, and policy briefs for strategic sectors.</li> </ul>	<ul style="list-style-type: none"> <li>- Launching IPS is considered a "structural reform" priority as it directly affects IRCC's image and main activities, however it is also a "strategic positioning" priority.</li> <li>- internal institutional changes (structural &amp; functional) are governed by external procedures and approvals (by the Ministry of Industry, Ministry of Finance, The Bureau of Civil Service Affairs, Council of Ministers). IRCC will work to execute related tasks under its responsibilities, however the center cannot control or be held responsible for the pace of progress in activities related to external parties.</li> </ul>
	Structure and flow								<ul style="list-style-type: none"> <li>- Presenting amended organizational structure for discussions and suggestions</li> <li>- Review of the amended structure by the Minister of Industry and the Board of Directors and obtaining approval for the new structure</li> <li>- Implementing the new structure</li> <li>- Follow up on the registration and certification of the IRCC's new amended organizational structure</li> </ul>		
	Diversification of resources								<ul style="list-style-type: none"> <li>- Create and review strategy;</li> <li>- Review of financial and accounting requirements for receiving direct fund</li> <li>- Definition of maintenance and research funding requirements, preparation of proposals to various potential donors and mobilization of external resources</li> </ul>		

Objective	Time								Implementation tools & activities	Measurable outputs	Notes
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8			
Strategic positioning	Industrial knowledge and information								<ul style="list-style-type: none"> <li>- Launching the new website with rich and regularly updated content, and creating official email addresses for the IRCC staff and units;</li> <li>- Subscribing to relevant electronic libraries and improving the center's library;</li> <li>- Participating in the comprehensive industrial survey and activating the IRCC's trade point;</li> <li>- Publishing to enhance awareness of industrial issues.</li> </ul>	<ul style="list-style-type: none"> <li>* Establishing the Industrial Incubator.</li> <li>* Establishing the IRCC's email, online library and online presence in addition to reviving industrial information, publications and contributions) as well as activating the center's publishing house.</li> <li>* Launching 3 to 4 flagship projects as per IRCC's strategic priorities and securing sufficient funding for these projects.</li> <li>* Finalizing improved financial arrangements for consultancy services and external funding for independent units.</li> </ul>	<ul style="list-style-type: none"> <li>- While strategic positioning activities may vary during this phase with diverse research and consultancy focus areas to better serve the national industrial sector, nevertheless these objectives and priorities remain as the main framework of activities carried out during this strategic period.</li> </ul>
	Training and animation								<ul style="list-style-type: none"> <li>- Increase the number certified training courses provided by IRCC;</li> <li>- Increase training opportunities for IRCC staff and increase their capacity through institutions where the center is a member;</li> <li>- Encourage the exchange of knowledge and experience between members of the IRCC and other research institutes.</li> </ul>		
	Industrial incubator								<p>Design and approval of the Industrial Incubator project, as well as forming the incubator's board of directors and securing the necessary fund for the first batch of incubated start-ups.</p>		
	Consultancies								<ul style="list-style-type: none"> <li>- Re-establish IRCC's consultancy service and resolve issues related to the consultancy and funding account;</li> <li>- Link IRCC's consultancy services to electronic presence (website), and initiate consultancy services related to industrial policies.</li> </ul>		

Objective	Time								Implementation tools & activities	Measurable outputs	Notes
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8			
Restoring relations Branding, partnerships & Public relations									<ul style="list-style-type: none"> <li>- Reintroduce the center to partners and stakeholders after the implementation of structural reform and strategic positioning priorities;</li> <li>- Launch the activities of the Institute of Industrial Policy Studies (IPS);</li> <li>- Strengthen communication and conduct joint activities with partners.</li> </ul>	<ul style="list-style-type: none"> <li>* Holding 4 to 6 joint activities and MOUs with stakeholders (including: the industrial sector, partner organizations and networks, public sector, educational and research institutions).</li> </ul>	<ul style="list-style-type: none"> <li>- Activities related to restoring IRCC's external relation practically start taking place once the new administration assumes duties. However, it becomes an apparent strategy as per the timeline define in this table.</li> </ul>

By the end of the strategic plan (i.e. end of financial year 2022) the strategy's outputs will be evaluated based on the achieving the measurable outputs defined above in this work plan according to the eight strategic priorities.

## Ahead and beyond

The following paragraphs will go beyond the strategy's main priorities and measurable outputs to explore general concepts that are important to be considered while working on improving and upgrading IRCC as well as the industrial field in Sudan.

### **Contribution to the Sustainable Development Goals 2030**

In 2015, the international community led by the United Nations adopted 17 Sustainable Development Goals (SDGs) designed as a "blueprint to achieve a better and more sustainable future for all". These goals include the pressing issues affecting all the people on our planet. Without getting into the discussion of the content of these goals, and whether they are realistic or progressive enough, it is nevertheless obvious why these goals should be primary concern of research institutes around the world as well as in Sudan. Thereby and in order for Sudan to adequately commit and contribute to the SDGs, and to utilize our connections to the rest of the world towards our internal development goals, we shall design our development programs and present our developmental discourse in connection with the SDGs. The 8<sup>th</sup> and 9<sup>th</sup> SDGs are respectively "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" and "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". IRCC will work on linking its projects and programs with these two goals.

### **Transformative Industries and Sustainable Energy**

IRCC is closely linked to the fields of transformative industries and sustainable energy due to the fact that all IRCC's units and activities will contribute to these fields. Transformative industries cover a wide range of sectors that include all institutes and offices in the IRCCs structure, while the importance of sustainable energy for industry makes it a pillar of any active industry.

### **Rural Development and Industries**

Rural development is of special importance in the Sudanese context as it is in the general African context. As ca. 70% of the population in Africa live in the rural areas, Sudan is not quite far off from that percentage. Rural areas also contain most of the resources necessary to initiate development processes. References mention that agriculture is the main source of income for 60% of the population, the sector also contributes 39% of the country's GDP and includes the majority of its transformative industries. Many developing countries, such as Sudan, implement development models that prioritize urban areas. Accordingly, more people/workers migrate towards the urban areas as they – urban area – acquire an unfairly large portion of the country's wealth and can therefor provide a relatively better quality of life . There is a vicious cycle of cities crowded beyond their capacities and empty rural areas with reduced productivity, and breaking this cycle requires serious thinking and work in rural development. It is important that IRCC and the Ministry of Industry prioritize and give special attention to the industries in rural areas.

### **Thinking in Systems**

Systems can be briefly defined as sets of "things—people, cells, molecules, [machines, procedures, etc.]—interconnected in such a way that they produce their own pattern of behavior over time" \*. The problems of our modern world require sociological and technological (or technosocial) solutions. These are mostly systems related problems where systems thinking can facilitate better understanding. In the field of development, including industrial development, we might not need new theories, institutions and approaches as much as we need to build new systems. Old systems have mostly failed, exhausted their purposes or have been turned obsolete due to historical development and changes in circumstances. Building systems requires comprehensive understanding of the phenomena at hand and the utilization of suitable theories, approaches and best practices.

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\* Donella H. Meadows. 2009. *Thinking in systems: a primer*. London: Earthscan. page.2