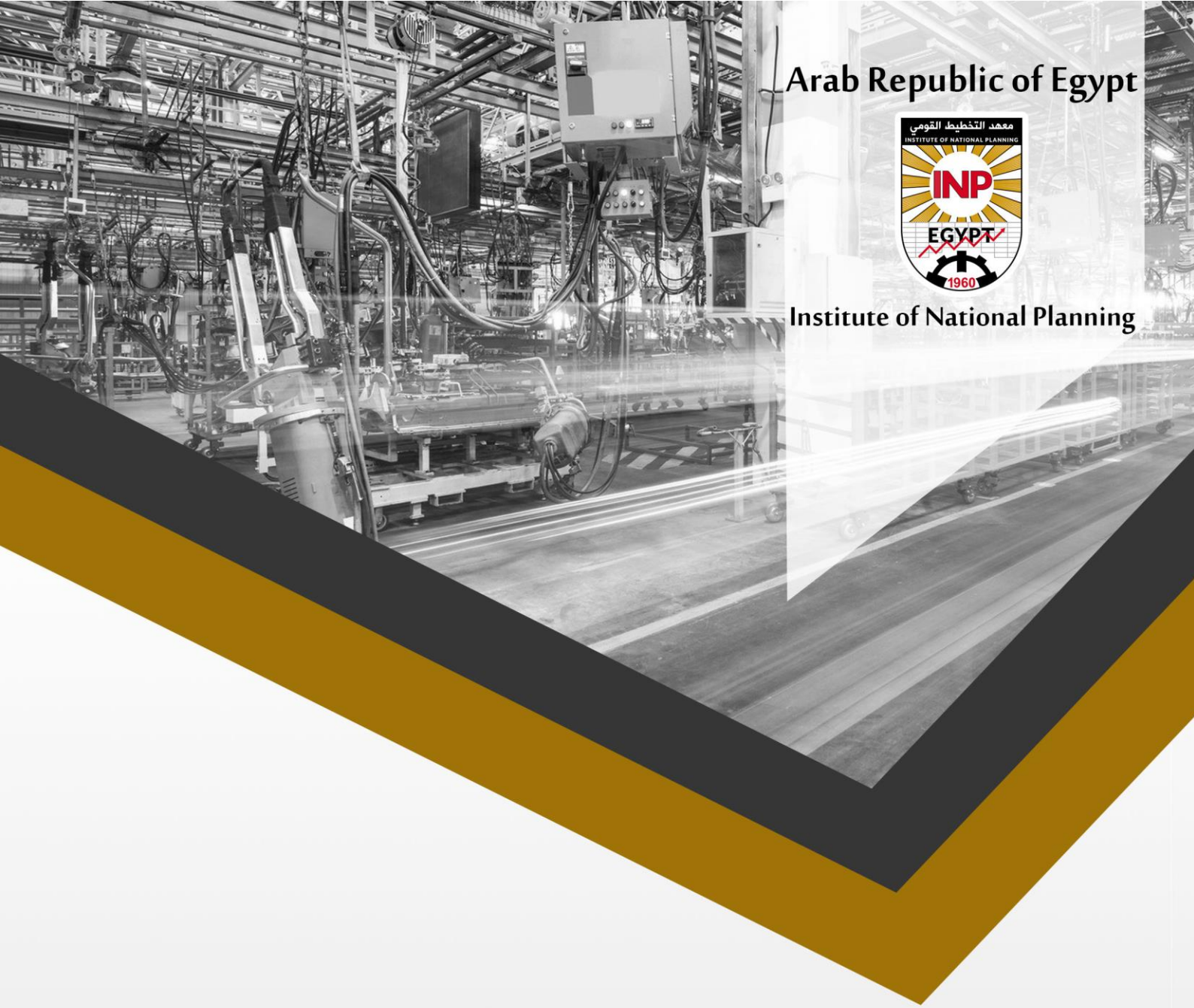

Arab Republic of Egypt

Institute of National Planning

Deepening Local Industrialization in Egypt
An INP Project

Summary of the Project's General Report

July 2023

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Deepening Industrialization: A National Imperative

Introduction

The overall developmental performance of a country is a collective outcome of collaborative efforts at various levels of all the active parties in the development process. This performance is directly influenced by the quality of interaction between the country and its concerned institutions with the global and regional changes, risks, and opportunities. Egypt made significant progress in the stabilization phase through the economic reform program from 2016 to 2019. Most economic indicators have shown improvement, and Egypt achieved notable advancements in infrastructure development, including an extensive network of roads and transportation, energy projects leading to advancements in electricity and gas access, and a new generation of urban cities. As Egypt transitions into the phase of economic openness through structural transformation, which we believe should be built on a solid industrial and technological foundation anchored in principles of knowledge, innovation, development, collaboration, and governance, this strategy should be aligned with the guidance and support from all levels concerned directly or indirectly with industrialization. This approach aims to launch a developed and sustainable national industrial base as a starting point for Egypt's progress.

Deepening industrialization is a national issue that should take precedence at the awareness and conscience of the Egyptians. The fact that all developed countries are industrialized is not incidental, as demonstrated by their top rankings in international reports on education, innovation, competitiveness, happiness, and quality of life.

There are several critical questions that need to be addressed in depth:

- What is the development philosophy/method in Egypt, encompassing economic, fiscal, and trade policies, aimed at encouraging both local and foreign investment?
- In light of the global repercussions of the COVID-19 pandemic and the Russia-Ukraine crisis, should there be a reassessment of priorities based on lessons learned?
- What is the targeted contribution of productive sectors, including manufacturing, in the Gross Domestic Product (GDP) for the coming decade, and how does this impact the investment directions?
- To what extent do various country institutions and entities collaborate in shaping visions, strategies, and policies, and how effectively do development documents reflect societal aspirations?

- What role does the country envision for itself ranging from active participation to having a facilitating role?
- Are there already multiple technological options, or are we guided by the rapid developments in technological revolution applications, influencing certain options such as the structure and size of local and global markets?
- Is there a consideration for producing technology relying on domestic expertise and scientists in the country and abroad, along with registered patents?
- What form of new educational approaches and mindsets are essential for the contemporary reality and for the coming future?
- Does the spatial dimension remain equally vital when dealing with emerging technologies, especially with regard to integration into global value chains?
- Is climate change, with its global impact, somehow connected to the selection of technology types and consequently the targeted industries and products?
- What is the ideal combination of energy sources required in the upcoming years, considering the global shift towards green financing?
- Will the conflict over natural resources persist, or can modern technology offer alternatives on how to maximize its benefits without political or military conflicts?
- What are the social and cultural dimensions of industrialization, technology, and innovation?
- How do different societal organizations and institutions contribute in mobilizing the potential capabilities of the Egyptians?

These questions are essential to formulate a comprehensive and strategic approach to deepening industrialization and achieving technological advancement in Egypt. Addressing the previous questions requires meticulous and in-depth studies involving experts and national intellectuals, based on a holistic view that connects various issues mentioned without undue haste. These questions span various significant aspects, and their answers are crucial to fostering an industrial breakthrough, driven by accelerated growth rates, ultimately achieving the highest development goal of enhancing the citizens' quality of life through sustainable employment opportunities and fair distribution of development benefits.

To attain these goals, the Institute of National Planning (INP) has launched a project titled "Deepening Local Industrialization in Egypt." This project delves

into the complex relationship between industrialization and major issues such as the Fourth Industrial Revolution, rapid technological advancements, global crises and disruptions, knowledge-based economy that encompasses creativity, innovation, education, and smart training; contributing to the development of natural, social, and knowledge capital. The project also covers the need for digital transformation across all sectors, international trade and global competitiveness, climate change and its interactions, energy and its uses, governance and its consequences, including resource allocation efficiency and the reduction of waste, as well as addressing issues of poverty, protection and social justice.

A steering committee was formed to oversee the project, comprising members from the Institute of National Planning (INP) and external experts. The committee was chaired by INP President and included various experts in economics, planning, and related fields. During the period from July 1, 2020, to February 28, 2022, the Steering Committee included Prof. Dr. Alaa Zahran, INP President as Chairman of the Committee, Dr. Ibrahim El-Issawy, Professor of Economics at INP and the Director of the Project, Prof. Dr. Khaled Attia, INP Vice President for Research and Graduate Studies, Prof. Dr. Amani Al-Rayes, INP Vice President for Training, Consultations, and Community Service, Prof. Dr. Samiha Fawzi, Former Minister of Commerce and Industry and Professor at the Faculty of Economics and Political Science at Cairo University, Prof. Dr. Ashraf El-Araby, former Minister of Planning, Follow-up and Administrative Reform and Professor at INP, and Dr. Ali El-Bagalati, Assistant Professor at INP, and the Rapporteur of the Committee. Following my appointment as INP President on March 1, 2022, I assumed the chairmanship of the Steering Committee, Prof. Dr. Alaa Zahran became a member of the Committee and Dr. Dalia Ibrahim, Assistant Professor at INP, was appointed as the Committee's Rapporteur.

The steering committee was responsible for monitoring the organizational and procedural aspects of the project, specifying topics for the working papers to be written in line with the project’s Conceptual Document, and identifying related problems deemed worth studying or discussing in workshops. It also nominated authors to write the working papers, collaborated with them to develop implementation plan for their papers, and monitored progress of these plans. Progress was tracked through drafts and reports presented by the project director. The committee developed a plan for seminars, workshops, and workgroups, actively participated in these events, and in overseeing their implementation. The Project Director, in coordination with the previous and current Co-chairs of the

Steering Committee, prepared the final report summarizing the project's outcomes.

On this occasion, I extend my sincere gratitude, thanks, and profound appreciation to all the esteemed members of the steering committee and their assistants. I would like to express special gratitude to Prof. Dr. Ibrahim El-Issawy, the Project Director, for his diligent and commendable efforts from the inception of the project until the completion of the project's general report. His leadership and expertise have been instrumental throughout his distinguished academic career, and this has been evident in his continuous dedication to the project.

The Project's Steering Committee would like to express its gratitude to General Abdel Moneim Al-Taras, the Chairman of the Arab Organization for Industrialization (AOI), for his valuable support of the project. His willingness to receive a delegation representing the project, consisting of INP representatives, and his visit together with a number of AOI experts helped to initiate fruitful collaboration between the two organizations. The two visits witnessed a constructive dialogue between the representatives of AOI, the representatives of the project in particular, and the representatives of INP in general. His Excellency also had an appreciable role in facilitating the participation of a large number of representatives of AOI in workshops, Tuesday Seminars, and Expert Meetings organized to provide inputs for the project.

Thanks, are also due to numerous leaders of the Federation of Egyptian Industries and representatives of various industrial sectors, both public and private, as well as industry experts and academics who responded to the INP's invitation to participate in the project. Their valuable insights and contributions in workshops, seminars, expert meetings, and discussions have played a pivotal role in achieving the project's goals. Special thanks are due to Prof. Dr. Mustafa Ahmed Mustafa, Professor at INP and the Coordinator of the INP's Tuesday Seminar, for his substantial efforts in organizing and moderating the seminar sessions in 2020/2021 and 2021/2022.

The project appreciates the significant efforts of its assistant team and would like to thank Mr. Mohamed Hassanein, Ms. Aya Melligy, Ms. Shaimaa Azab, Ms. Heba Hisham, Ms. Samah Ghalab, Ms. Heba Kamel and Mr. Tarek Selim. Their efforts contributed to the success of the workshops, and to the documentation of their outcomes. They also provided some preliminary calculations and data analysis.

Finally, the Steering Committee of the project extends its sincere thanks and appreciation to the authors of the project's working papers for their

dedication in repeatedly reviewing the drafts of their papers and for their positive response to the modifications requested during our discussions.

Last but not least, the Steering Committee extends sincere thanks and appreciation to the authors of the project's working papers for bearing the burden of repeatedly reviewing the draft papers and for their positive response to the additions and modifications arising from the discussions concerning those drafts.

Finally, on behalf of myself and all the participants in finalizing this project, I would like to express my sincere thanks and deep appreciation to Dr. Hala El Said, Minister of Planning and Economic Development, and Chairperson of the Board of Directors of INP. I also express my gratitude to all the respected members of the Board for their continuous support and assistance in all the various activities and programs of INP. Their dedicated support strengthens the role of INP as a national center of expertise, knowledge, and a think tank for the country and all its institutions, with the hope of a bright future that brings prosperity to our beloved Egypt.

Prof. Dr. Ashraf El-Araby

President of the Institute of National Planning

Report Contents

Report Summary

This summary includes the outcome of a three-year research effort conducted within the framework of the project "Deepening Local Industrialization in Egypt" launched by the Institute of National Planning (INP) in Cairo during the summer of 2020. This project aimed to achieve the following four objectives:

1. Identifying the gaps and weak connections in the logical chain for advancing industrialization from the conceptual stage to implementation.
2. Proposing specific policies and mechanisms to fill the gaps in the logical chain for deepening industrialization with the missing links and reinforcing the weak ones, in order to transform the goal of deepening industrialization into action. This involves developing an integrated industrial policy and closely aligning research, development, and innovation policies with production facilities.
3. Identifying industries suitable for deepening based on various criteria and methodologies.
4. Identifying requirements to deepen the industrialization in some of the nominated industries, examining their potential for improvement through analyzing case studies.

Providing an integrated plan or a detailed action program for deepening industrialization was not of the project's objectives. This is because the effort required for such a task exceeds the capacity of the research team, no matter how large its size. It requires the collaboration of multiple scientific, research, economic, technological, production, social, political, and executive entities to implement the systemic approach adopted by the project and to ensure the alignment of the directions and policies pursued by relevant authorities.

The general report incorporates findings from 28 documents prepared within the project's framework, along with data collected from a large number of workshops, seminars, scientific meetings, field visits, and additional materials from various sources. This summary presents a brief overview of the key findings of this report, which comprises thirteen chapters, in addition to the introduction, and Appendices.

Deepening Industrialization is an Old and Renewed Goal, and a National Imperative

The aim of deepening industrialization is not to rely entirely or partially on imported components, including production components or machinery, equipment, devices, or production technologies. Instead, it means striving to manufacture some of these components locally. This leads to an increase in the local component in final or intermediate products, reducing imports and enhancing self-reliance in development while meeting the state's needs, whether for production or consumption purposes. Deep industrialization entails three fundamental dimensions as follows:

First: Expanding the scope of heavy industries in general, with a specific emphasis on the machinery and equipment industry.

Second: Enriching local value chains by adding more links in the supply of raw materials, intermediary goods, and locally manufactured components to replace some of the imports, as well as assisting in increasing exports.

Third: Increasing local contributions to industrial designs and technologies, replacing some of the imported elements through technological development and innovation.

A significant outcome of the process of deepening industrialization is the increased integration of the national economy’s production structure and the strengthening connections between its various industries and sectors. It also involves the progress towards building a national scientific and technological base, ultimately moving towards liberalization of the country from technological and economic dependency. These results are among the prominent features of the desired structural change in the context of the development process.

Given the increasing emphasis on sustainability in general and the environmental aspects of development in particular, deepening industrialization represents a valuable opportunity to restructure the industrial sector towards green industrialization, circular economy practices, and other environmental preservation measures, such as pollution control, resource conservation, and climate change mitigation. Deepening industrialization serves as means to reduce external dependency, thereby enhancing national security. It is a measure of an economy's self-reliance, a foundation for sustainable development and an indicator for a country’s resilience in the face of external shocks. Hence, this report is entitled "Deepening Industrialization is a National Imperative".

Despite the current report's focus on deepening industrialization in Egypt, it does not ignore expanding the industrial base. Expansion and deepening are not completely separate matters. Expansion may involve the creation of new industries, whether for the production of final products or raw materials and products that assist in deepening existing industries. Deepening, on the other hand, necessarily involves expanding the industrial base by establishing new industries to process raw materials for industrial use and produce intermediate goods and components needed by existing industries. On the other hand, there are challenges in expanding the industrial base, and therefore, the proposed solutions for facing these challenges benefit both the expansion and deepening paths. These solutions have broader advantages as they help improve the investment and business environment, creating a better framework for comprehensive development.

Undoubtedly, one of the key reasons for launching this significant research project on deepening industrialization in Egypt by INP was its importance, along with the noticeable shortage of Egyptian scientific studies and research on the topic of deepening industrialization, despite its relevance dating back to the emergence of the modern industrialization movement in the 1950s. Even during periods of declining interest in deepening industrialization, following June 1967 War and the subsequent implementation of economic liberalization policies in 1974, the topic continued to be a subject of research and discussion among the advocates of its necessity. Recognizing the importance of building a national foundation for science and technology as a means to enhance the pivotal role of industrialization in the overall sustainable economic and social development and to liberate the country from economic and technological dependency. Numerous studies, seminars, and conferences have been conducted, and organized by research centers and scientific associations, reflecting the renewed interest in deepening industrialization. In the early 1980s, with the establishment of the National Investment Bank, interest in deepening industrialization was revitalized. In May 1990, the bank launched the "National Project for Deepening Local Industrialization of Investment Equipment" and a national conference on this topic was held in January 1992. The "Permenant Committee" which was established for this project continued its activities throughout the 1980s and 1990s. However, only a few of its results were implemented, with the rest being overlooked. Interest in the committee's work and deepening industrialization itself experienced a decline over time.

In the second decade of the 21st century, Egypt introduced its Vision 2030, outlining specific goals for the industrial sector, notably focusing on "deepening

local components in industrial goods and upgrading the value chain". Additionally, the Industrial Technology Council, a part of the Academy of Scientific Research and Technology, conducted a study on deepening industrialization in 2013, and updated it later in 2019. In 2017 and 2018, the Deepening Local Industrialization Committee of the Ministry of Commerce and Industry conducted extensive studies that ultimately led to the launch of the National Program for Deepening Local Industrialization in October 2018. To expedite the practical steps toward deepening Industrialization, an Executive Council for Import Substitution and Local Product Deepening was formed in November 2021, led by the Minister of Trade and Industry. In May 2022, the Global Economic Media Conference was held to announce the country's plan for discussing the economic challenges of the global economic crisis, and the means to overcome them. Deepening of Industrialization was addressed, where the state plan encompassed initiatives such as localizing national industries while expanding the workforce base, designing a program for localizing the automotive industry and encouraging the private sector to deepen local industrialization. The conference's recommendations emphasized the urgency of expeditiously completing the comprehensive strategic vision for the national industry, prioritizing key sectors, and deepening local industrialization.

Despite some notable successes in the field of deepening industrialization in Egypt, as outlined in chapter three - which is a confidence-inspiring achievement in the ability to deepen industrialization and overcome challenges along the way – these achievements fall short the significance of deepening industrialization in Egypt. This is particularly evident when considering the long-standing history of this subject in Egypt and the numerous related official statements and decisions. In response to this fact, INP has launched the National Project for Deepening Local Industrialization, anticipating that its outcomes would accelerate progress toward achieving this significant national goal.

Here we start: An Appropriate Development Model

The effective addressing of industrialization in general, and deepening it in particular, necessitates the adoption of a new developmental philosophy/model and requires a precise understanding of the meaning of development, starting from a systemic perspective. Development is a process of major structural transformations across various components of society. It extends beyond the economic status, although this typically remains a central focus. It also encompasses social, political, legal, and institutional dimensions, including education, training, learning, scientific and technological advancement, energy, and the environment. Moreover, the meaning of development extends to culture

and value-related aspects, along with various forms of art, serving as a spiritual strength essential for individuals seeking to improve their quality of life and elevate their nation among others. The essence of development is in the liberalization and empowerment of individuals and the nation they belong to. The starting point for this liberation and empowerment is the restructuring of the country's internal affairs. The structural transformations implied by development go beyond internal societal relations; they involve a radical redefinition of the country's position in the global division of labor and a fundamental shift in its economic and political relations with other countries.

Deepening industrialization plays a pivotal role in development. It is not an exaggeration to assert that industrialization, particularly building a broad and profound foundation of manufacturing industries, stands at the core of development serving as a potent driver for progress. The sector of manufacturing industries contributes to increasing productivity not only in the industrial sector itself but also as a positive influence in all sectors of the national economy. This sector acts as a catalyst for organizational innovations that often originates within it and subsequently permeates into other various sectors. Moreover, this sector's growth positively impacts other sectors, such as transportation, finance, and business services, by expanding the market for these activities. Additionally, since manufacturing industries produce tangible, non-perishable goods, they are more tradeable and contribute significantly to foreign exchange earnings. Given the substantial foreign exchange demand, compared to agricultural products and services, these industries are a critical source of funding for a developing country's extensive imports needs.

After a thorough examination of philosophies/models in the literature on development, we have chosen to endorse the philosophy/model of the self-reliant developing country, as described in the first chapter. As chapter one illustrates, this model has foundations that are intricately interconnected, stemming from its systemic approach to development. This model is based on six pillars as follows:

(1) Self-reliance to enhance human capabilities and significantly increase domestic savings rates.
(2) Developmental state and comprehensive national planning
(3) Democratic participation and fair income and wealth distribution
(4) Management of national economic relations with foreign countries
(5) Highlighting cooperation among Southern countries in various aspects
(6) Encompassing the requirements of sustainability in the broadest sense

As implied by the model's name, the developing country assumes a pivotal role in achieving comprehensive and integrated development, as previously elucidated. The functions of the developing country extend beyond the traditional roles typically associated with the country, such as monitoring and indirectly guiding economic activities through encouragement and incentives for the private sector. In addition to these functions, the proposed model assigns six additional responsibilities to the country:

(1) **Optimizing Economic Surpluses:** The country is to convert potential economic surpluses into actual economic gains, by regulating both private and public consumption, rationalizing imports, and eliminating various forms of resource waste and production deficits to fund capital accumulation.

(2) **Maximizing Utilization of Surpluses:** Maximizing the utilization of economic surpluses means avoiding their fragmentation and dispersion, ensuring that decisions about their allocation are not made by parties or platforms where it originated based on specific preferences. Instead, these surpluses should be consolidated and directed towards agreed-upon purposes aligned with the desired development goals.

(3) **Direct Involvement by the state in Production and Investment:** The state actively participates in production and productive investment in collaboration with both local and foreign producers.

(4) **Building Production Capabilities:** The country is responsible for building production capabilities within the economy through education, training, research and development, technological advancement, and innovation promotion. This is essential for enhancing the knowledge base and skills of the workforce.

(5) **Establishing Effective Industrial Policy:** The country develops a rational industrial policy that accelerates and deepens industrialization, expanding the industrial base and fostering a harmonious collaboration between the public and private sectors.

(6) **Achieving Economic Stability and promoting Competition:** The country strives to achieve economic stability, encourages competitive behavior in the economic environment, and builds institutions that reduce uncertainty in economic, social, and political situations.

However, the effective implementation of these functions is unattainable without coordination through a comprehensive development plan. Planning is an essential guarantee for the success of the country in implementing its development vision, ensuring that the contribution of the public sector, the private

sector, and the cooperative sector is optimized. The developing country needs to activate both mandatory planning for essential infrastructure projects and strategic industries that the private sector may not be equipped to establish them. It also needs to plan the designation of projects that can be implemented by both the private and the public sector in the production phase. Regarding the decentralization and centralization debate, the old principle remains pertinent, which is centralized planning and decentralized execution.

Characteristics of the Egyptian Manufacturing Industries Sector

Chapter two highlights the key findings regarding the main challenges facing the manufacturing industries sector in Egypt.

The share of manufacturing in Egypt as (% of GDP) has faced a downturn for nearly half a century, with limited fluctuations around the range of 16-17 %. There has been a notable decline in this share since 2006/2007; in 2020/2021, this share did not exceed 14.8%, including petroleum refining, and it did not surpass 10.7% when excluding petroleum refining. One noteworthy aspect is the absence of a consistent governmental trend for the manufacturing industries sector to surpass the agricultural sector by a significant margin in Egypt during the period from 2006/2007 to 2020/2021. These indicators demonstrate that Egypt's manufacturing industries have remained in its early stage of development.

The decline in the share of the manufacturing industries in the GDP and the limitation of this share can be attributed to the sluggish growth of these industries' output. This, in turn, is attributed to the weak industrial investments and the low overall investment rate, which tends to decrease over time. The recent period has witnessed a continuous decline in the growth rate of the manufacturing industries, dropping from 4.8% in 2017/2018 to a negative rate of -5.80% in 2020/2021. This decline is even more demonstrated when excluding petroleum refining from the manufacturing industries. The reduction of the manufacturing industries' growth is due to the decrease of the sector's relative share in total investment, as well as the decreasing number of active facilities in recent years, and the Production was halted due to operational challenges faced by these facilities has further contributed to this decline. The diminishing share of the manufacturing industries sector in total investment and its declining over time can be attributed to the low overall investment rate, resulting from extremely low domestic savings rates. Furthermore, there are limited foreign direct investment inflows, with a considerable portion being directed towards acquiring existing

facilities rather than establishing new projects. Consequently, it is quite clear that the growth and the investment rates in manufacturing industries reveals its vulnerable foundation, underscores the urgent need for prioritizing this sector from the perspective of comprehensive and sustainable development.

Upon analyzing imports data by utilization category, it reveals that the Egyptian economy heavily relies on imports across various sectors, including manufacturing industries, to fulfill their needs from capital goods and production inputs. The average of these two groups is between 72% of total imports in 2006-2009 and 76% in 2018-2021. Notably, the annual average percentage of imports of intermediate goods to the total production of manufacturing industries experienced a notable increase, from about 19% in 2006-2007 to around 40% between 2016-2018. This development clearly indicates a higher dependence of manufacturing industries on imported components, leading to a reduction in their complexity. When classifying manufacturing industries in both the public and private sectors based on their dependence on imported production inputs, it was found that 48 industries had an imported production inputs exceeding 35%. These industries belong to the ten industrial groups that are nominated for deepening mentioned in the project.

Analyzing the structure of industrial exports based on technological intensity, it reveals a predominant reliance on natural resources and low-tech products, constituting about two-thirds in 2020. Medium-technology-level exports were relatively low, making up less than a third, while high-technology-level exports did not exceed 2.2%. Egypt's participation in global value chains is characterized by forward integration, with limited participation in backward integration. An analysis of industrial competitiveness shows that Egypt's performance is weak, with a low international ranking. A recent study examined the potential for increasing industrial exports by revitalizing eight industrial activities, which are part of the ten industrial groups recommended for deepening mentioned in the project.

The capacity of the manufacturing industries sector to absorb labor showed to be limited, as it has not exceeded 12% of the total workforce. The employment growth rate in the past decade was modest due to the narrow base and slow growth of these industries. A notable disparity in job opportunities persists between industries and agriculture. The share of employment in manufacturing industries is 1.7 times smaller than the share of agriculture in recent years. This historical pattern indicates that Egypt is still in the early stages of industrialization. It is worth noting that labor productivity in most manufacturing industries enterprises

is low, attributed to the prevalence of small and micro-enterprises, where high labor intensity is combined with a low technological level.

It is noteworthy that the private sector produces the largest share of the manufacturing industries' output, whether oil refining is considered or not. In terms of growth rates, they have been weak and declining in both the public and private sectors, even turning negative in 2019/2020 and 2020/2021. The relative distribution of investments in manufacturing industries between the public and private sectors has undergone significant changes, especially since 2018/2017. After the increase in the share of the public sector in the preceding years (2009/2010-2006/2007), there was a substantial decline in the following seven years, reaching a minimal level in 2016/2017. However, this share witnessed a remarkable surge since 2017/2018, reaching approximately 70% in 2020/2021, when oil refining is included in manufacturing industries, and about 64% when excluding oil refining. On the other hand, the share of the private sector in investments in manufacturing industries has been decreasing since 2017/2018, reaching around 30% and about 36% based on the broader and narrower definitions of these industries, respectively, in 2020/2021. One of the main reasons for the decline in the private sector's share of investments in manufacturing industries includes the devaluation of the Egyptian pound in November 2016 and the private sector's reluctance to invest locally, preferring foreign investments due to concerns related to the business and investment environment. Additionally, there is uneven competition resulting from privileges granted to state-owned enterprises that the private sector does not have access to. Furthermore, state-owned enterprises have been inclined to acquire shares in existing private-sector facilities.

Regarding the regional distribution of manufacturing industries, it is characterized by concentration pattern. It is estimated that in the year 2017, 70.7% of the total production of manufacturing industries in both the public and private sectors was concentrated in just five governorates. As for the rest of the governorates (22 governorates), most of their production has been concentrated in five governorates. Thus, approximately 90% of the production of industries is concentrated in ten governorates, with only one Upper Egypt governorate, Asyut, contributing a share of no more than 2%. It is noteworthy that this high level of concentration in the regional distribution of manufacturing industries applies to both private and public sector facilities, with minor differences. Additionally, there is a significant disparity between the regional distribution of manufacturing industries and the distribution of the population. Despite the presence of cities, industrial zones, and free zones throughout the country (109 zones in 2017), these

regions tend to follow the same high concentration. In summary, the geographical concentration of manufacturing industries remains a prominent feature of Egypt's economic landscape.

Egyptian Expertise and Experiences in Deepening Local Industrialization

There is no doubt that confidence in the success of deepening local manufacturing in Egypt is reinforced by the country's previous experiences in enhancing various industries to varying extents. Therefore, the project paid special attention to documenting available information regarding Egypt's experiences and endeavors in advancing manufacturing in ten industries. In the context of exploring these experiences in the third chapter, obstacles that hindered the progress of deepening industrialization were also noted, representing missing or weak links in the logical chain of transferring manufacturing depth from the realm of ideas to effective implementation. The primary source of this information came from meetings with officials from numerous industrial companies in both the public and private sectors, as well as representatives from the Egyptian Union of Industries, the Arab Organization for Industrialization, and the Ministry of Military Production. These insights were gathered through 14 workshops and 16 specialized seminars as part of Tuesday Seminars organized by the Institute of National Planning, a platform for discussing development and planning issues. The total number of participants in these workshops and seminars was 153, including experts from the project's Steering Committee, as well as members of the staff members and their assistants of the Institute. In addition to the information obtained from these meetings, the project team conducted interviews and field visits as well as research papers. Some supplementary information was also added to further audit some data or shed more light on specific aspects and developments.

Examples of Experiences in Deepening Ten Industries

1. Electronic Industries: Benha Electronics Industries Company (144 Military Factories) collaborated with the Air Defense Research and Development Center and the Electronics Research Center at Cairo University in the production of radar devices. The company also produced high-frequency devices for the Armed Forces' Signal Administration. Despite being described as an Egyptian radar produced entirely domestically, information on the local component percentage is not available. Furthermore, the company participated in the value chain with Toshiba Trading and Industry Company and El Sewedy in producing surface-mounted electronic circuits. Additionally, the company collaborated with the Chinese company ZTE to manufacture smart meters for the Ministry of Electricity and Energy.

Information about the local component percentage in these two fields is not available.

2. Automotive Industry: In 2018/2019, there were approximately 500 companies serving 16 automotive assembly plants. Around 80 companies directly produce components for these plants, while the remaining companies supply imported components to assembly plants. Some of the notable products produced by these companies include exhaust emission control units (mufflers), air conditioning units, radiators, electrical cables and wires, hoses, plastic products for interior car parts, glass, mirrors, and car seats. Approximately 60% of these companies export their products to foreign markets, with 80% going to European countries, 18% to Arab countries, and 2% to Asian countries. Despite initial legal requirements mandating car assembly companies to have 40% from local components, subsequently raised to 45%, some sources suggest that the actual percentage does not exceed 17%.

3. Medical Devices Industry: In 2020 and in response to the COVID-19 pandemic, the Arab Organization for Industrialization (AOI) launched a project by mobilizing a group of young engineers to employ reverse engineering to design and manufacture a ventilator. The project involved the collaboration of young engineers, AOI, the Ministry of Higher Education and Scientific Research, the Academy of Scientific Research and Technology, and the private sector company Bio Business. In Early May 2022, 50 locally manufactured ventilators were completed, meeting the required standards and obtaining approval from the Egyptian Drug Authority. Egyptian contributions primarily involve device design, representing approximately 70-80% of the device's value, while most components are imported from specialized foreign companies. In addition to ventilators, AOI also extended its manufacturing capabilities to include sanitization and disinfection equipment, including a self-contained sanitization and disinfection portal. AOI also produced masks, mobile isolation rooms, and sterilization cabins. Another example of deepening local industrialization efforts in the medical devices industry is exemplified by the National Affiliation for Local Manufacturing of Meta specialized in the production of medical plates for bone fixation using laser technology.
4. Heavy and Metal Industries: In November 2021, an initiative to produce armored steel plates was announced through cooperation between the 100th Military Factory and the private sector company Ezz Steel. The significance of this product extends beyond supporting military industries, considering its historical prohibition from export to Egypt. Some experts

suggest that certain iron and steel factories had unused furnaces that could have been utilized in producing armored steel plates. Additionally, some iron factories such as the Al-Marakbi factory (private sector) initially focused on rolling processes but later shifted to manufacturing steel plates using imported scrap materials, which were then used to create reinforcement iron bars and wire coils. Regarding the railway industry, the primary manufacturer of railway components in Egypt is the Semaf factory which was established in the mid-1950s as part of the public sector, its ownership was transferred to the Arab Organization for Industrialization in 2004. The local participation in this factory reaches approximately 80% in the manufacturing of cargo wagons and between 50% and 60% in passenger wagons and metro cars, including interior fittings. In addition to Semaf, the National Authority for Railways in Egypt oversees maintenance companies and the production of some spare parts for the railway industry.

5. Machinery, Equipment, Production Lines, and Spare Parts: The number of factories engaged in the manufacturing of machinery and equipment is estimated to be around 700 registered factories, with a considerable number of unregistered ones. Estimates from the Chamber of Engineering Industries at the Union of Egyptian Industries indicate that Egypt relies on imports for approximately 50% to 60% of its machinery and equipment needs, with some projections indicating around 80%. To address the breakdowns of machinery and equipment in some companies due to the unavailability of imported spare parts, the Metals Research and Development Center has participated in the local manufacturing of various spare parts. This was the case for High Dam turbines, steel rollers, Helwan Castings Company, and the Dekheila Company, in addition to the production of spare parts for armored vehicles and other military equipment for the armed forces.

The Sugar and Integrated Industries Company has employed reverse engineering and CNC (Computer Numerical Control) machines in the manufacture of some of its needs of spare parts, machinery, and equipment, in addition to its cooperation with some Egyptian companies and workshops in the manufacture of production lines for sugar factories, with the exception of the necessary steam turbines, which are imported. The company has established sugar factories in Iran and in Sudan. The company also supplies some other companies with spare parts and production lines, such as oil and soap factories. SEBIMATEC (private sector) has carried out more than 600 projects for the supply of spare parts for railways, the Ministry of Irrigation, power plants, water treatment

plants, cement plants, and the mining and quarrying sector. The percentage of the local component in the spare parts manufactured by the company reached about 60%. Dr. Abdul Halim Omar, a transportation engineering professor at Carleton University in Canada, designed the Asphalt Multi-Integrated Roller machine (AMIR), which was manufactured by factories affiliated to the Ministry of Military Production and exported to Canada. Chemical and Petrochemical Industries: The local component in the chemical sector ranges from 30% to 40%, while in construction materials, it can reach around 70%. Aqua Nile for Chemical Industries, a private sector company, has succeeded in locally manufacturing water treatment chemicals, a crucial product utilized across various industries. Despite obtaining ISO certifications, marketing local products has faced significant challenges due to the prevailing dependence on imports and the lack of commitment by government entities and companies to comply with the Local Product Preference Law. Agro Nova operating in the private sector has managed to produce natural pesticides in its Beni Suef factory. The main advantage of this type of pesticide is to kill insects without posing risks to human health. One of the obstacles faced by the company is the inability to register its product, because the ministerial decision on pesticides does not include natural pesticides, and thus deprives the producer of this type of pesticide from receiving export support.

In the field of petrochemicals, the Oriental Weavers Group set up a factory in Port Said to produce polypropylene granules, constituting 80% of the raw material needed for carpet production. The Oriental Weavers group collaborated with a British university to address technical problems encountered during production. The National Research Center has been instrumental in developing additives for various plastic products since 1994, such as antioxidants, UV stabilizers, thermal dispersants, and corrosion inhibitors, all of which have been patented. However, these innovations have not progressed to the production stage due to a lack of interest from companies or manufacturers willing to adopt the manufacturing process.

6. Home Appliance Industry: The local manufacturing percentage for one of the major private sector companies in the home appliance sector, Araby Group for Trading and Industry is approximately 40%. The group is working to deepen the local manufacturing of some of its products, including fans, hoods, stoves, refrigerators, and washing machines. It relies on local production for some components of electrical and electronic

household appliances, such as electronic boards, wires, cables, flat glass, and refrigerator gaskets. Additionally, the group has a factory for washing machine motors, with a local component of approximately 30%, factories for producing plastic and foam parts, three workshops for the repair of molds, and a factory that is under construction for cutting sheets instead of importing them pre-cut. The Research and Development center established by the group supports these activities. Some companies affiliated with the National Organization for Military Production manufacture household appliances, such as Shubra Engineering Industries (27th Military Factory), which produces fans, air hoods, and washing machines, Helwan Engineering for Industries (99th Military Factory), which produces stoves (flat cookers), cooking ovens (cookers with ovens), and Helwan Metal Appliances (360th Military Factory), manufactures water heaters. However, the proportions of local components in these products remain unclear.

7. Pharmaceutical Industries: Limited progress has been made in the Local deepening of pharmaceutical manufacturing. One example is the production of the drug Proxymol, used to treat urinary tract problems, from a plant called Cymbopogon schoenanthus at the Nile Company for Medicines and Chemical Industries. In recent years, a pharmaceutical cooperation under the auspices of the Academy of Scientific Research and Technology was formed to produce the amino acid Glycine, which is used in various medical applications, including the production of glutathione, a substance with multiple functions in the body, such as an antioxidant and a producer of chemicals and proteins needed by the body, especially the immune system. This cooperation also aims to produce a dietary supplement from rice straw used for weight loss.
8. Textile and Ready-Made Garment Industries: Achievements in deepening these industries include manufacturing approximately 50% of the necessary spare parts for machines in the Moket Mac company, which is part of the Oriental Weavers Group. Additionally, around 70% of the company's needs for certain auxiliary machines, such as carpet processing machines, are produced locally. Some of these achievements were realized in collaboration with the National Research and Development Center, the British University, and Al-Shorouk Academy, all affiliated with the Oriental Weavers Group. The Group has also established a polypropylene plant covering 80% of the production of carpets. The group also established a cotton cultivation project in the El-Oweinat region, focusing on short-staple and colored cotton, which provides alternatives to some imported

cotton types, although the quantities produced are limited, and the seeds are still imported.

9. Food Industries: Some food industry companies have taken steps to deepen these industries. One significant step is the reduction of date imports after achieving significant expansion in using Egyptian dates in the production of biscuits and date-filled products, especially in the New Valley, where the quality of dates has notably improved. Moreover, there has been a decrease in reliance on imported sugar, particularly after the expansion of sugar beet cultivation, leading to a self-sufficiency rate of 78% in sugar consumption. Despite these advancements, challenges persist in the production processes leading some manufacturers performing additional processes on locally produced sugar to make it suitable as a substitute for imported starch. In addition to the progress in the manufacture of semi-automatic slaughterhouses using reverse engineering for meat processing.

Gaps and Weaknesses

Below are the most prominent gaps or deficiencies in the logical chain to move the deepening of industrialization from thoughts to action.

(1) Despite the existence of numerous research centers and multiple initiatives aimed at fostering scientific research and its integration with industry, their effectiveness is weak, and their return on industrial facilities is low. This is primarily attributed to the poor funding and insufficient efforts to develop the capabilities of the staff of research centers, and the absence of clear strategies for scientific research and technological development activities. As well as training and retraining centers, although abundant in quantity, demonstrate poor performance, so their impact on upgrading the skills of the industrial workforce remains minimal.

(2) The lack of selectivity or targeting, or the absence thereof, is another significant challenge. This is manifested in the failure to establish specific objectives for distinct industries and their associated research centers, along with a lack of monitoring progress towards these goals based on performance indicators. The absence of targeting and selectivity is particularly evident in the realm of investment promotion and the provision of incentives to stimulate it. Incentives are rarely associated with individual industries, they are often generalized (except in remote areas and for small enterprises), and are not coupled with performance indicators in the areas of operation, technology, or local components.

(3) There is a shortage of long-term funding for projects, which is often provided by specialized development banks that have been transformed into commercial banks focusing on short-term loans. International institutions such as UNCTAD and UNIDO have emphasized the crucial role of these banks in industrial development.

(4) There is a misconception regarding medium, small, and micro-enterprises where they are often perceived as an end goal in themselves. In fact, many small and micro-enterprises aim primarily for survival rather than development, and a significant portion operates informally or outside established structures. In general, Egypt lacks strategies to effectively link medium and small enterprises with larger projects and to promote the growth of medium-sized enterprises into larger ones. This is essential to address the issue of the "missing middle" in the buildings' structure.

(5) Many industrial zones and clusters lack essential components such as facilities, financial services, guidance and technical support, and livelihood opportunities. Consequently, these areas fail to operate as effective industrial hubs.

(6) The decreasing role of the state in driving structural transformations in the economy, building scientific and technological capabilities, and developing the manufacturing sector is noteworthy. The public sector, which used to own a significant portion of the companies, has undergone privatization or liquidation, depriving the remaining companies of the necessary investments to renew their production capabilities. This situation is connected to a misunderstanding of the concept of a developmental state and the prevalence of a misguided perception in the past decade, which incorrectly suggests that a developing country undertakes productive, service, or infrastructure projects. Thus, the private sector is exposed to unfair and unequal competition, and parts of it may have been seized by the new public sector. Despite the critical role of the people's involvement in shaping developmental priorities and decisions, a vital aspect in the advanced model of a developmental state aimed at rectifying past errors, this participation is lacking in Egypt. (7) The institutional, regulatory, and legislative frameworks governing the industrial sector and business operations in general, are characterized by complexity. Enforcement of laws and policies is ineffective, and the legal procedures for dispute resolution are both sluggish and expensive. There is a lack of a comprehensive industrial development strategy, responsible leadership for its implementation, and insufficient supervision of industrial policy, technology policy, research and development, and innovation at the national level.

(8) There are significant and deep gaps in information concerning the economy, industry, and both local and global markets. These gaps hinder the completion of detailed studies on industrial deepening and the development of well-founded feasibility studies in this field, it may lead to wasting potential opportunities for industrial development, deepening industrial activities, and expanding exports. (9) There is insufficient emphasis is placed on employing Arab and African regional cooperation in support of deepening industrialization, as well as promoting food security matters. Trade liberalization approaches often prevail over production-oriented and joint project approaches in bilateral and multilateral agreements.

(10) Short-term perspectives and the rush to reap the immediate benefits prevail, despite the importance of adopting long-term perspectives, especially in building heavy industries such as iron, steel, aluminum, petrochemicals, and machinery and equipment manufacturing. These industries have strong ties to long-term development in general and industrial development in particular, what hinders industrial investment and long-term planning for projects is sudden changes in macroeconomic conditions and the absence of a reasonable degree of relative stability in policies and procedures. It should be noted that most of these weak or missing links are not exclusive to deepening industrialization; rather they impact the entire industrial sector. These links are not isolated; they are interconnected. This insures the importance of comprehensive and interrelated solutions to address the absence or weakness of these links.

It is clear from the above-mentioned that Egypt has not started from scratch in the field of deepening its industries and that it has successful, but incomplete experiences. The country has demonstrated a level of confidence in its capability to advance in various industries. However, the possibility of achieving noticeable successes along this path is contingent upon finding effective solutions to the problems identified earlier: the missing or weak links in the logical chain of putting ideas into action. The following chapters and the concluding chapter of the report will focus on the efforts that must be made to fill these gaps or reinforce the identified weaknesses.

Industrial Policy: The Cornerstone for Advancing and Deepening Industrialization

Comparing the Egyptian case to best practices in chapter four reveals the absence of a supportive industrial policy for deepening local industrialization in Egypt in recent years, in accordance with the concept applied in countries that have succeeded in this field. The vast majority of policies or programs aimed at

localizing industry did not include specific quantitative targets, manifested in indicators of performance that can be monitored and evaluated. An exception to this trend is the adoption of quantitative targets for some performance indicators included in the "Structural Transformation Plan" recently launched by the Ministry of Planning and Economic Development in April 2021. Also, the Ministry of Trade and Industry's plans incorporate specific figures for Egyptian exports promotion strategies, policies, and programs. However, the strategy of the Ministry of Trade and Industry to promote industrial development and foreign trade (2016-2020) lacked any quantitative objectives to deepen or localize industrialization. Moreover, it failed to include sectoral or geographical targeting to deepen local industrialization, which was considered one of the pillars of the strategy.

Successful experiences indicate the linkage of industrial development policies and deepening local industrialization policies with the development of the agricultural sector aiming to enhance its efficiency and productivity, yielding higher returns per acre. However, the available data indicates the limited contribution of the agricultural sector to GDP (12%), its low productivity, and the encroachment and erosion of agricultural land due to the insufficient return on the cultivated acre. Previous experiences also emphasize the importance of advancing the extractive industries sector as it helps deepen industrialization by providing alternative raw materials to the amount imported, an aspect that has not received adequate attention in Egypt. As for foreign direct investment, industrial policies and various strategies have not set specific quantitative targets for attracting it to the industrial sector, specific industrial activities, deepening the industry, or even stimulating exports. Foreign direct investment remains concentrated in the petroleum and natural gas sectors.

Most important lessons learned from international practices.

1. The necessity of adopting a national industrial policy developed through participatory manner involving relevant stakeholders in its formulation and implementation, while recognizing that a successful industrial policy develops through experimentation.
2. The integration of the Industrial with trade and innovation policy, engaging all relevant parties from local and foreign, public and private sector companies, local administration and central government, and international institutions concerned with finance.
3. The establishment of a set of measurable objectives aligned clearly with the specified priorities of industrial policy. Since industrial policy typically

takes a relatively long time before it yields tangible results, it is important to sustain its implementation regardless of changes in leadership or management.

4. The necessity of adequate financial resources to support the various components of the industrial policy, as the absence of sufficient funding hinders its effectiveness in achieving desired outcomes. The success of industrial policy hinges on strong political support at the highest level and the presence of highly competent government leadership for its management and implementation, along with an appropriate regulatory and institutional framework.

Ten Issues worthy of heightened Attention in the Formulation and Implementation of Industrial Policy

1. The stance on the rules of the World Trade Organization (WTO)

World Trade Organization rules have put pressure on decision-makers in developing countries, as it is no longer possible for these countries to use and deepen some of the tools that were used for industrialization by developed and newly industrialized countries prior to the establishment of the organization in 1995. There are prohibitions, and strictness regarding the feasibility of implementing some allowances, in addition to the limitations imposed on expanding the organization's authority to include the trade in goods, services, foreign investment, and intellectual property rights. In fact, many developing countries are not willing to apply certain tools to protect their emerging industries or take procedures to address balance of payments deficits. They don't use tools or apply procedures that may be legally non-compliant by the World Trade Organization, or anticipate an appeal in using these tools or procedures from member countries within the organization, which may involve the developing country in costly legal disputes. This approach by developing countries may also stem from their fear of being accused of going against the tide of globalization and opposing the policies of the new economic liberalism embraced by international financial institutions that oversee the global capitalist system. Moreover, there is a concern about potential repercussions from major decision-makers in these institutions, which could result in developing countries being denied loans and aid. It is essential not to miss any opportunity to utilize industrial policy measures by developing countries, even if such usage is subject to certain restrictions or is available for a limited period.

Below is a list of what is usable to benefit and deepen industrialization, along with insights into Egypt's stance.

(1) There are industrial policy actions that can be freely taken as they are not bound by international agreements. These include investment in infrastructure to serve certain industries or regions, allocating funds for research and development activities and train workers, or provide public support for these activities or for less developed areas in the country, and provide tax incentives for investment. Egypt has adopted these measures, including government procurement programs favoring local products over foreign products, though the implementation was delayed until the issuance of Law No. 5 of 2015.

(2) There are international industrial policy measures that can still be implemented. The state can raise the customs tariff as long as it has not yet reached the maximum bound level. It also has the right to impose additional tariffs or quantitative restrictions to address balance of payment deficits, in accordance with Article No. 12 of the General Agreement on Tariffs and Trade. Article No. 18 also allows government support for economic development, including measures to protect nascent industries, and measures to address balance of payment deficits. According to Article No. 19, a country can take emergency measures, including suspending some of its commitments, in an abnormal surge in imports of certain products that would harm corresponding products and domestic producers, affecting the competitive situation. The Uruguay Round introduced a number of measures and rules to prevent the misuse of this article to protect extended periods or to reduce the likelihood of such practices occurring. Egypt's use of these tools is limited or non-existent, as there is inclination to liberalize its trade and expose the local industry to a high degree of foreign competition, under some bilateral and multilateral agreements, such as "Zero Customs" on European cars since the first of January 2019. There are articles that Egypt has effectively implemented, such as Article No. 6 of the GATT for anti-dumping, countervailing and compensatory procedures, where it has established a well-functioning system for the application of this article. Even if there are restrictions on the activation of the GATT like Article No. 12 or Article No. 18, or on the use of certain types of support, some experts believe that it is possible to exploit the gaps in certain rules or in their implementation.

(3) There are difficulties in controlling the direction of the foreign investment within the framework of the Agreement on Investment Procedures with an Impact on Trade, as this agreement prohibits the host country to oblige the foreign investor to use local products, or the proportion of a local component in its production, or that its imports do not exceed its exports. However, it is possible to implement controls to facilitate the transfer of technology or to set a limit to the foreign partner's share in the capital of a joint venture. As discussed later,

some local content restrictions and intellectual property constraints affecting trade-related technology transfer can be bypassed through what is known as offset contracts. Some of these restrictions may also be bypassed based on national security considerations contained in Article No. 21 of the GATT.

(4) Concerning the liberalization of trade in services under the General Agreement on Trade in Services (GATS), countries have the flexibility to choose which service sectors they commit to liberalize. Given the weak situation of services in developing countries, most of them – including Egypt - have not committed to liberalizing many service sectors.

(5) The GATT encompasses a specific section on trade and development (Part IV), which includes Article No. 36 regarding preferential treatment for developing countries to facilitate their economic progress, and Article No. 37 on the commitment of developed countries to give priority and special attention to removing trade barriers to the entry of products from developing countries into their markets. This means that developing countries receive special and differential treatment (S&DT) from developed countries. An example of such treatment is facilitating the access of developing country products to developed country markets. Unfortunately, this part of the GATT does not involve any obligation for developed countries, but rather encourages their best efforts to provide such treatment. This was mentioned in the Doha Ministerial Declaration issued in November 2001. However, this effort has not succeeded yet, given that the Doha Round has not been held 22 years after its agreement.

Generally, Egypt should not hesitate to defend its right to use protective measures, support and address balance of payment deficits, and facilitate economic growth available under the rules of the World Trade Organization, albeit with varying degrees of restriction. It is important to protect emerging industries properly, and policymakers should avoid the mistakes of the past in the implementation of protectionist policies, which turned protection into a permanent policy and obscured the inefficiency of the protected industries. This is called unwise protection, but the required protection is the smart one, necessarily temporary in nature, where protection is tied to a limited period during which a comprehensive program is implemented to enhance the technological and economic capabilities of the local industry. The protection rate should gradually decrease during this period until it expires. Furthermore, Egypt, along with other developing member countries of the organization, should strive to prioritize development within the organization’s agenda. This includes activating special and differential treatment, extending the duration of protection for nascent / emerging industries, and protecting its economies from unfair competition,

accessing advanced countries' markets, solving disruptions in many of the organization's rules and agreements, and enhancing transparency in the organization's negotiations.

2- Benefiting from economic balance programs and offset contracts

Deepening industrialization faces many obstacles, especially the limitations of the local market, lack of export opportunities, and the difficulty of acquiring technology. These obstacles are exacerbated by the shrinking fiscal space available to finance industrial development, including the deepening of industrialization, especially in light of the high rates of external debt and the increasing burden of debt servicing. One possible way to address some of these obstacles involves the utilization of economic balance programs and offset contracts. According to these programs, foreign companies and institutions that have signed government procurement contracts - equal to or exceeding a certain value - are obligated to enter into projects that add value to the national economy of the contracting country, under what is known as offset contracts. These are sub-contracts derived from the original contracts for civil and non-civil government procurement, that link the supply of these purchases to specific conditions, such as assisting in the export of local products, technology transfer, investment in the local economy, joint manufacturing, using a certain percentage of local inputs in factories or equipment or contracted goods, training local staff, and other conditions beneficial to the economy of the purchasing country.

The chance of obtaining more benefits than foreign companies is contingent on the contracting country's negotiation capabilities and skills, awareness of prices and other advantages offered by competing companies, the willingness of these companies to engage in offset contracts, the availability of local capabilities to manufacture inputs needed by the supplier company or products that can help this company market them abroad. Egypt's membership in the World Trade Organization does not preclude the benefit of offset contracts. These contracts are mentioned in Article No. 16 of the Government Procurement Agreement of 1994, which is a voluntary agreement that Egypt has not yet joined.

There are several factors that encourage the implementation of an economic balance program and offset contracts in Egypt, the most important of which are the following:

- The great amount of the government purchases bills for goods and services from abroad, with these purchases holding significant importance, impacting international markets, such as the impact of government

purchases of wheat, oils, meats, and others on the global exchanges for these commodities.

- The presence of a number of government procurement contracts with foreign companies span various fields, such as subway contracts, railway procurement contracts, power stations, sewage plants, desalination plants, the New Administrative Capital project, and related contracts in the field of construction, telecommunications, transport and communications, modern trains, oil and gas projects, and other contracts eligible to enter into economic balance programs.
- Many countries and companies express their interest in entering the Egyptian market whether as suppliers or contractors or investors, due to the high return on investment compared to other countries, combined with the presence of large purchasing and consumer power in Egypt.

Hence, Egypt is expected to be in a favorable negotiating position when requesting the implementation of these programs with foreign companies seeking to start or expand their activities in the Egyptian market. The success of the Balance and Offset Contracts Program in Egypt requires careful design of the program and precise formulation of its objectives and conditions in cooperation among all ministries, in accordance with the lessons learned from international practices. A number of operational actions are crucial for the program's success. First, the government formulates the general features of an Egyptian program for economic balance and offset contracts, through a committee comprising representatives of the Ministries of Defense, Trade, Industry, Finance and Planning, and the Central Bank. Second, the development of the legislative and institutional frameworks necessary for the application of the program and contracts is undertaken by technical group of experts and specialists from the above-mentioned committee. Third, the establishment of a High Council for Economic Balance is proposed to serve as a governmental entity responsible for supervising the implementation of the program and offset contracts, and approving governing rules. Fourth, the establishment of an economic balance holding company to serve as the investment part of the program, with a focus on establishing projects and works related to modern digital industries, through partnerships with major industrial companies in the world. This initiative aims to support the growth and further deepening of industrialization.

3-Enhancing competition in the Egyptian market

Despite the crucial role of competition in boosting the competitiveness of countries and various industries, the emphasis on ensuring fair competition

among different production units operating in the Egyptian market has not yet received sufficient attention. One of the noteworthy paradoxes is that the Competition and Anti-Monopoly Law No. 3 of 2005 was only enacted 31 years after the introduction of the open-door policy in 1974. Moreover, this legislation was not an independent decision made by the country but rather a compliance with the terms of the Egyptian-European Partnership Agreement, which entered into force in January 2004. The delay in issuing the Law on the Protection of Competition can be attributed to the resistance shown by some state-owned companies and some power centers in the private sector because of their monopolistic control over some activities. It is possible that the realization of the importance of competition policy in its comprehensive sense did not crystallize until the promulgation of the Egyptian Constitution issued in April 2014 specifically in Article No. 27, this realization came nine years after the issuance of the Competition and Anti-Monopoly Law. However, a clearly defined and declared competition policy in the Egyptian economy has not yet became clear; hence, competition policy has not yet emerged as one of the pillars or axes of industrial policy. There is no doubt that it becomes challenging to explore the connection between competition, growth, or efficiency when some economic activities lack competition and unfair competition prevails, as is the current situation in Egypt.

A study and analysis of the actual situation in the Egyptian market revealed the widening gaps in fair competition between state-owned companies and private sector companies, hindering the creation of a conducive environment for investment and growth. One prominent gap involves the lack of clear separation between the role of the country as a regulator and market observer in some sectors and its role as an active participant in economic activities, especially in the tele-communications and banking sectors. In these sectors, state institutions and companies affiliated to various ministries have privileged access to information and decision-making compared to private companies operating in the same field. The lack of transparency regarding the operations of state-owned companies is another notable issue. These companies are subject to numerous laws, each with distinct regulations and advantages. Many state-owned companies operate under distinct laws and regulations, leading to a lack of information regarding their economic activities that directly compete with those of the private sector. These include companies affiliated with bodies emanating from some ministries such as the Ministry of Defense and the Ministry of Military Production, such as the National Service Projects Authority, the Arab Organization for Industrialization, and the National Organization for Military Production.

In addition to economic entities that function as state-owned companies, a considerable number of them involved in similar production activities as the private sector. These include the engagement in commercial and non-commercial (i.e. non-profit) activities by some state-owned enterprises (SOEs) and economic bodies, without a clear distinction between them; thus, it is difficult to distinguish between the costs and revenues of these different types of activities - an essential aspect of achieving fair competition between SOEs and their private competitors.

One of the gaps hindering competition is that some state-owned companies enjoy various advantages, potentially leading to lower production costs compared to their competitors. Among these advantages are the exemptions granted by many laws to state-owned projects, such as exempting the projects of the National Service Projects Authority from taxes on income, and exempting imports of imported machinery and equipment for the benefit of state companies in the oil and transport sectors from customs duties. In addition to the ease of access of state-owned enterprises to public banks to obtain credit facilities compared to their private sector counterparts. Finally, one of these gaps is indirect support for many state-owned companies in some activities, such as securing a consistent demand for their products, for example by obliging government agencies to travel on Egyptian Airlines or prioritizing state-owned companies in supplying major projects with their needs of construction materials such as cement and iron. It should be noted that a state ownership policy document was issued in December 2022, aiming to address many of the previous points, as it stressed the country's commitment to the principle of competition and tax justice among all organizations and institutions irrespective of ownership or affiliation. In addition, in July 2023, the Egyptian parliament passed a law that includes the abolition of tax exemptions granted to state-owned companies/ projects.

It is noted that some sectors in the Egyptian market lacks not only legitimate competition, but also suffers from considerable extent of unfair competition. These include competing with activities that are based on smuggling goods or evading paying customs duties and their associated fees for activities that comply with importing through legal channels. In addition, these include competition between informal and formal entities, where the former do not bear many of the financial costs and legal, technical, health, and other requirements of the latter.

It is important to recognize that advocacy to promote competition doesn’t imply advocacy to exclude the state from economic activities. There are recognized cases, even in neoclassical economic literature, where the state undertakes productive activities. Examples include natural monopolies and

situations where the private sector is unable to establish certain industries due to high-risk or extended spawning periods, among other market failures. Rather, the state's exercise of economic activity must be within the framework of a clear strategy for industry based on ensuring fair competition, encouraging the private sector, and avoiding non-organized implementation.

This state intervention may be justified for a certain period to support competition in specific supply markets. However, the lack of transparency regarding the role of the state in the economic activity, the transformation of temporary intervention into a permanent situation, and the insistence on excluding the interventions of the government and various state institutions when practicing economic activity from being subject to the Competition Protection Law - which contradicts the text of the law itself - all damage the competition, and thus harm industrial development. Concerning competition advocacy, two things need to be taken into account. First, the prevalent pattern of competition, especially in developed countries, is not a perfect competition, but monopolistic competition. Second, successful development experiences have favored the establishment of large industrial entities, and have restricted entry into some industries to ensure that large ones have the opportunity to achieve economies of scale, lower prices, and enhance their competitiveness against foreign products. This practice is also justified from an innovation perspective, as larger industrial facilities have greater capacity to finance research, development, and innovation compared to smaller ones. It is worth noting that the Egyptian legislator has recently paid attention to this matter through the amendments made to the Law on the Protection of Competition and the Prevention of Monopolistic Practices as reflected in Law No. 175 of 2022.

It has become permissible for the Competition Protection Authority to authorize economic concentration when it leads to the exit of legal entities from the market, or if it is proven that the concentration will result in economic efficiency that outweighs the effects of reducing competition, or if it serves considerations related to national security, provided that the conditions specified in the executive regulations of this law are met. However, a comprehensive analysis of market conditions, especially in the industrial sector discussed in this report, reveals the absence of a clearly defined and declared competition policy for the Egyptian industry. Therefore, the country shall adopt a clear competition policy in the industrial sector to ensure fair competition between industrial operators regardless of ownership, and in a manner that does not conflict with considerations of efficiency, economies of scale, the nature of each industry and its competitive elements. While the State Ownership Policy document

appropriately emphasizes the principle of competition, it is important for this principle to be effectively implemented to address the identified gaps in fair competition. Thus, the country must: First, provide data and information that facilities market analysis, enabling informed investment and economic decisions to prevent excess/idle production capacity and the waste of investments. Second, review the Law on the Protection of Competition, in order to achieve more independence for the Board of Directors of the Agency in law enforcement, ensuring the effectiveness and efficiency in supporting market competition. Third, foster collaboration between the state with its various agencies, with the private sector to support competition in the markets, aligning with the Law on the Protection of Competition and the Prevention of Monopolistic Practices, which reflects positively on the investment and production climate. This requires the engagement of the Competition Protection Authority with the business community by providing a full explanation of the various technical concepts in the law, how the authority interprets them, outlining the measurements of these concepts – which is one of the matters on which the executive regulations currently lack specificity. It is also necessary for the government to provide guidelines outlining the framework of the Competition Protection Authority while ensuring the accessibility to all parties concerned by the law.

4. Promoting the regional spread of industries

The current structure of manufacturing industries in Egypt is characterized by a high degree of regional/ geographical centralization. As we found in the second chapter, about 71% of the production of these industries is focused in five governorates (Cairo, Giza, Qalyubia, Sharqia, and Alexandria). The first three governorates constitutes the Greater Cairo Region, which includes the three largest industrial cities (6th of October and 10th of Ramadan and Obour), in which more than two-fifths of the manufacturing industries are produced. In fact, about 90% of industrial production is concentrated in ten governorates, including only one of the Upper Egypt governorates (Assiut with a share of 2% of the total manufacturing industries production). The characteristic of the geographical concentration of industries can be observed when using an indicator recognized in regional studies, which is the industrial localization factor. Applying to the so-called economic regions, it becomes evident that the concentration of manufacturing industries in the seven regions specified by the Presidential Decree No. 495 of 1977 is in Cairo, the Canal region, and the Delta region, and to a relatively lesser degree in the North Upper region, the South Upper region. Concentration is strongest when measuring concentration factors at the governorate level.

It is worth noting that this highly concentrated pattern is repeated with regard to both the public and private sectors, enterprises operating in cities, industrial and free zones, and foreign investment, despite the many incentives provided by Law No. 72 of 2017 on Investment Guarantees and Incentives. These incentives cover general benefits provided for all projects, and specific benefits provided for each of the projects that are established in the Suez Canal Economic Zone, the Golden Triangle Economic Zone, and other areas most in need of development (Sector A), and for priority projects (Sector B), whose geographical scope is determined by the law according to the investment map. The executive regulations of the law showed that Sector B includes the rest of the Republic in areas that have the elements of development and contribute to attracting investments to exploit the available development opportunities.

The lack of substantial geographical expansion for manufacturing industries, whether they involve the production of final goods or intermediate products that contribute to deepening industrialization, can be attributed to three main factors.

(1) Assuming that the investor primarily focuses on tax and customs reductions or exemptions and believing that market forces will naturally attract investors to the activities and areas benefiting from these incentives. This contradicts findings of investment studies in various regions of the world, which suggest that investors prioritize the overall investment environment, considering factors such as the speed of obtaining licenses and approvals, the complexity of project establishment and operation procedures, the stability of economic policies, and the certainty regarding the direction of major economic variables. Despite the government efforts in recent years to improve the investment environment, a significant gap still exists between the current situation and the desired one, evidenced by successful manufacturing experiences.

(2) Failure to equip industrial zones with other facilities and services needed by industrial projects, including power (electricity, oil, and gas), water facilities, transportation and financial services, technical consultancy, housing for workers along with services and facilities for their families, etc., with the availability of these services at reasonable prices. Many industrial areas lack these services, and industrial areas don’t yet function as industrial clusters. It can be noticed in the detailed pages of many activities in the investment map that the statement accompanying the item of the type of opportunities is "land only", and the statement mentioned before the item of services is "not attached".

(3) Insufficient detailed information on industrial investment opportunities. While an investment map is available, the information about governorates' characteristics is limited and does not effectively communicate the comparative advantages of different regions to potential investors. Also, the investment opportunities presented on the map in the various governorates often use general words that do not seem to be connected to the available resources, or existing industries in those regions. It doesn't provide information about complementary industries that could support with inputs or receive products for further industrial processing. Investment opportunities are often listed under broad headings for some industries without specifying the desired branches or sectors for investment, and even when some details are provided, the investor often left with vague and generalized information. Often, investment opportunities are simply portrayed as piece of land on which any project can be established. For instance, it might be categorized as "Industry," accompanied by a description such as "A vacant land available for investment" or "Area available for investment.".

The seeker of more precise opportunities for industrial investment can resort to the "Industrial Investment Map" published by the Industrial Development Authority and the Industrial Modernization Centre. Upon examining this "map," the reader will find, under the title "Industrial Land Offering - Investment Map (Phase Four)," a list detailing the "targeted activities" for each of the six industries, indicated by one or more "customs tariff items." An estimate of the so-called "2021 Local Market Gap in Million Dollars" is also shown. Under the title "Industrial Investment Map", reference is made to investment prospects in the governorates, as discussed in the previous paragraph. One of the links available on the Investment Opportunities page is labeled: "Proposals", indicating the lands offered to investors, where data are provided on the plots of land parcels in different locations across the Republic, specifying the number of plots (opportunities) offered in each location, their areas and prices, and the targeted sector (engineering industries - medical and pharmaceutical industries, etc...). It may or may not mention a specific activity within the sector.

In short, the information provided to the investor is fragmented, often general, and missing crucial details. In all cases, project maps are not available in specific industrial activities, and in appropriate areas which may have alternatives, provided that they should have undergone preliminary feasibility studies. The absence of such information complicates the investor's search for suitable projects to invest his money. Access to a detailed map of the industrial projects based on activity and appropriate geographical location may require further coordination between the Ministry of Commerce and Industry and several

other entities, including the Ministry of Petroleum and Mineral Resources, the General Authority for Investment, and the Ministry of Planning and Economic Development. Thus, it may be useful to point out two things. First, the deepening of quite a few industries is linked to the availability of raw materials, especially mineral ores, necessitating the expansion of the mining industries. Relevant information on some mining investment opportunities has been published by the Egyptian General Authority for Mineral Resources, a subsidiary of the Ministry of Petroleum and Mineral Resources. Second, it is beneficial to utilize the indicators prepared by the Ministry of Planning and Economic Development within the framework of its reports on the localization of the sustainable development goals at the governorate level to identify weaknesses in overall investment performance, especially in the performance of industrial investment. This insight could pave the way to further coordination in identifying industrial investment opportunities among the Ministry of Commerce and Industry, the Ministry of Petroleum and Mineral Resources, the General Authority for Investment, and the Ministry of Planning and Economic Development. The joint work between these entities may offer a chance to develop the investment map based on planning regions. This approach, considering these regions as units with greater resource diversity compared to the governorates, provides wider opportunities for project integration.

If addressing the above three causes does not lead to the dispersion of industries beyond the current concentration areas at the hands of the private sector, it may be necessary for the country to initiate a number of large projects in the targeted areas in Upper Egypt and in governorates located in the desert, choosing projects with strong forward and/ or backward linkages. The concept involves the initiation of large state-owned project to serve as an attractive pole for small and medium-sized enterprises. at which the private sector is called upon to establish, integrating with the large project as a provider of some inputs or as recipient of its products that need supplementary manufacturing or processing. In this case, the existence of such a large project will instill confidence to private investors and enable them to benefit from the external economies generated by the establishment of that project.

5- Approaches to overcome the problem of a limited local market.

One of the primary obstacles to the establishment of deepening industrialization projects, and even industrialization projects in general, is the inadequacy of the local market to absorb the raw materials or industrial components produced at a level commensurate with the economic size necessary

to reduce the cost of the product, and thus increase its competitiveness with imported equivalents. Addressing this issue is crucial when designing industrial policy in Egypt. There are four approaches to tackle this problem.

The **first approach** is to take into account that foreign investment projects coming to Egypt are not isolated from the rest of the Egyptian economy, as this phenomenon is commonly observed in many developing countries. Indeed, efforts should be made to integrate the activities of these projects in one way or another with existing activities. Foreign investment projects should rely on what they produce in Egypt to obtain a share of their inputs. This helps to deepen industrialization on the one hand and opens wider avenues for the distribution of local enterprises products on the other. While World Trade Organization (WTO) agreements prohibit mandating the presence of local components for foreign investments, it is possible to encourage foreign investors to source some inputs locally by demonstrating the advantages for their projects. This involves improving the quality of locally produced items and ensuring that they meet international standards, which can be attained through government support for research and development in local projects.

The **second approach** is to support local enterprises that produce industrial components in exporting their products to foreign markets. This involves not only providing support for exports - despite its importance - but also diversifying the forms of assistance by providing detailed information on foreign markets, and enhance export opportunities particularly those with which Egypt has trade agreements, especially free trade agreements, as well as facilitating ways for producers to participate in foreign exhibitions, and implement various strategies for promoting Egyptian products. In the context of deepening industrialization that relies on substituting local products by their foreign equivalents, there should be a concurrent policy that encourages exports, as it expands the market for import substitutes and enables economies of scale in production.

The **third approach** is to foster regional cooperation between Egypt and Arab and African countries by creating regional value chains. These chains serve indirect purposes aligning with the agreements of the free trade areas in which Egypt participates, both on the Arab and African levels, and direct purpose, by promoting intra-regional trade among member countries of these agreements. Despite the many trade liberalization agreements, there has been a lack of significant growth in intra-trade for the countries participating in these agreements. There are multiple reasons for the weakness of intra-Arab trade. These include non-tariff measures that cover about 50% of trade exchanges

between Arab countries, limited economic diversification in production structures, especially in Arab oil countries, and high shipping costs, due to inadequate transportation infrastructure among the Arab countries. A Crucial factor - is the lack of regional value chains based on joint production projects in which the production stages are distributed among a number of Arab countries, according to the relative advantages of each country, and the role of the industrial policy in creating opportunities for acquiring new relative advantages. Concerning the creation of regional value chains including Egypt, it is worth mentioning a study conducted by the Economic Commission for Africa (ECA) focusing on value chains for ten industries in the East African region that includes seven countries: Egypt, Morocco, Tunisia, Libya, Algeria, Mauritania, and Sudan. We will focus on the most significant findings concerning two manufacturing industries: textiles and clothing, and automotive industry. The study concluded that there are significant factors for developing a regional value chain for textile and clothing among five countries of the region: Egypt, Sudan, Tunisia, Algeria, and Morocco. The development of the chain in the five aforementioned countries is encouraged by the accelerated wage increase in China that makes the North African region a more competitive platform for textile and clothing production, as well as the utilization of the facilities granted by Agadir Agreement, which includes Egypt, Morocco, Tunisia, and Jordan. On the other hand, there are obstacles that hinder the development of the chain, these obstacles include the weakness of logistics and international transport between the countries of North Africa, the political and security unrest in some countries of the region, especially Libya, as well as the shift in European demand and the acceleration of relocation of international companies to other destinations, especially in Eastern Europe.

As for the automotive industry, the study noted the influence of multinational companies in this industry, especially in determining the location for each stage of production. Despite the growing importance of the automotive industry in North Africa, especially in Morocco and Tunisia, and to a lesser degree in Egypt, there is still a notable gap in the production of engines, pistons, steel components, wheels (except in Tunisia), brake systems, and other high-tech components. Among North African countries, Morocco has become the most integrated country in the global value chain of the automotive industry, positioning itself as the second automobile manufacturer in Africa after South Africa. Tunisia has also transitioned from assembly activities to high-value activities, with over 230 companies manufacturing components by 2015. Egypt's automotive industry still relies primarily on assembling imported parts and components. Algeria is the least engaged in the automotive industry in North

Africa, with no more than five assembly plants, and limited parts and components factories compared to the rest of the countries in North Africa. Intra-regional trade has increased, especially after the activation of Agadir Agreement, but the majority of this trade is concentrated on tourist vehicles rather than components. This means that regional value chain integration is limited. It is also noted that there are similarities between the countries of the region, which may foster competition rather than integration. Despite obstacles such as strengthening the regional value chain in cars, especially with regard to training and the development of specialized cadres, and the dominance of transnational companies in this industry, opportunities exist to strengthen regional integration through the establishment of joint companies mobilizing the human and financial resources of the countries of the region. This, however, depends on their determination, will, and improved political and security conditions.

Other proposals that could be considered for the establishment of regional value chains involving a number of Arab and African countries include the establishment of a regional food industry chain and a regional metallurgical industry chain. It is important to recognize the complexity of establishing regional value chains, which may prove even more challenging than integration into global value chains, as in the latter case it depends on the decision of the large multinational companies that dominate the management of these chains. However, the involvement of the countries in the global value chain region may impede or overlook the formation of regional value chains. This is attributable to potential competition rather than integration among the countries of the region participating in global value chains. However, it is not entirely inconceivable that regional value chains could serve as an attractive factor for global value chains, as observed in the case of East Asian countries. Key impediments to the formation of regional value chains include a lack of the necessary political will for regional integration, the non-binding nature of provisions outlined in regional strategies and agreements, the absence of well-conceived and designed practical programs and collaborative projects, the preference of some countries to establish a regional value chain for some industries (such as in the textile and clothing industry in Egypt, Morocco and Tunisia), and the resistance of political and economic power centers with interests in maintaining the status quo. Other challenges include a prevalence of informal activities and small-scale enterprises, hindering product compatibility with regional and international standards, and limited awareness among many producers about the opportunities for productive cooperation with their peers in neighboring countries, and insufficient understanding of the benefits arising from regional value chains and from trade liberalization agreements. Last, but not least, there is a major obstacle to

establishing value chain, which is the prevalent security and political turmoil in the countries of the region, and disputes that may amount to the severance of diplomatic relations between some countries or even escalating into military conflict. Creating regional value chains hinges on overcoming these barriers.

The **fourth approach** involves expanding the market for industries that aim to deepen industrialization by joining one or more of the global value chains that have become the living embodiment of the globalization phenomenon. Certain sectors, such as the automotive and electronic industries, have become closely intertwined with these chains. The management of global value chains is dominated by transnational corporations. Policies that attract foreign direct investment, especially through transnational companies, have become a way to increase the country's participation in global value chains. It is important to note that transnational corporations manage global value chains in alignment with their own interests, which do not always align with the interests of their host countries, especially those seeking development. Therefore, this may allow developing countries to manufacture a component based on the terms set by these companies concerning production technologies, and export opportunities.

In general, while participation in global value chains has advantages, it does not necessarily guarantee a safe or easy path to industrialization, and its deepening. The key consideration lies in the nature of the entry point available to the developing country, the extent to which this entry point is related to the development of local productive capacities in general, and its contribution to deepening industrialization in particular. This is in addition to the positioning of the link within the chain that the country joins, and the potential opportunities to ascend to higher links of the chain. Extensive evidence indicates that companies dominating the global chain tend to retain high-value-added jobs that lie at either end of the so-called "smile curve," which resembles an obtuse U. This curve links value-adding activities with the corresponding added value they generate. On the left side are the functions related to knowledge, research and development, innovation, and design, while on the right side are the functions related to marketing, distribution, and related logistics services. Manufacturing and assembly operations are located at the bottom of the curve as an indication of the decline in value added.

It is noted that Egypt's participation in global value chains is limited, whether it is backward participation or forward one. Despite an increasing engagement in these chains, this participation has been dominated by forward integration, as Egypt's exports constitute inputs for the exports of other countries. In 2018, 39% of the value added to Egypt's exports was represented by inputs that

contributed to the value-added of the exports of other countries. This percentage is notably higher compared to countries such as Jordan, Tunisia, Turkey, India, and Malaysia. As for the backward integration represented by the dependence of Egyptian exports on imported intermediate goods, was relatively weak, with foreign added value included in Egyptian exports not exceeding 11% of the total added value of Egyptian exports. This percentage is lower than the percentages for the aforementioned countries. Egypt's integration into global value chains is not an aim in itself and should be subject to careful assessment of advantages and disadvantages from a long-term development perspective. It should also be considered that such enrollment is not a substitute for strong efforts to build local industrial capacities which are relied upon in enhancing independence and self-reliance.

6- Considering environmental contemplations when deepening industrialization

Awareness of the risks of industrialization to the national environmental conditions and on global climate change has increased. Both local and global pressures have intensified, urging the incorporation of the environmental considerations in various aspects of life, with a primary focus on industrial activity. The environmental dimensions of deepening local industrialization programs are not different from industrialization programs in general. Industrial policy has an important role in incentivizing practices that prioritize environmental sustainability in particular, and contribute to overall sustainable development. These practices encompass efforts to conserve natural resources, enhance energy efficiency, transition to renewable energies, reduce industrial pollution, and increase resource recycling processes and transform the economy into a circular one. Moreover, there is an emphasis on fostering scientific research to generate innovations that can expedite the implementation of these measures and other necessary actions for mitigation and adaptation to address climate change. The 2019 environmental statistics indicate that the manufacturing industries sector and similar sectors collectively account for about 20% of greenhouse gas emissions. These emissions are categorized as direct emissions, and do not encompass those generated by other sectors on which the industrial sector depends, such as the energy, transport, and construction sectors. Emissions from the energy, transport, and industrial sectors are about 82% of total emissions in Egypt. Although Egypt's current contribution to global emissions is only 0.6%, future projections of the costs associated with climate change impacts, given Egypt's high rate of urbanization and economic growth by 2060, range from 2% to 6% of the GDP.

The UNIDO index, measuring efficiency of carbon dioxide emissions from Egyptian manufacturing industries in terms of kg for each unit of value added in the manufacturing industries, indicates fluctuations that happened during the first two decades of the twenty-first century. The index value reached 0.67 kg in 2019 placing Egypt in the 97th rank among 131 countries, near the beginning of the last quarter of these countries. This rank shows modest environmental performance, particularly considering the continuous decline in the emission index in the middle-income countries to which Egypt belongs. Based on the strong correlation between environmental performance and performance in the energy sector, it is worth noting Egypt's position according to the Energy Transformation Index, which monitors the performance of the energy system in countries and measures their readiness to shift to safer, sustainable, and reliable energy, where Egypt ranked 76th out of 115 countries in 2021, placing it at the lowest third of the countries covered by the index. Moreover, the Green Industrial Performance Index, which consists of three sub-indicators: the ability to produce and export green industries, the role of green manufacturing in the added value of industries and in their exports, and the social (employment) and environmental (carbon dioxide emissions) dimensions of green industries, depicts a decline in Egypt's position from the 61st place in 2014 to the 64th in 2017 among 112 countries. Although Egypt ranked third among the 16 African countries calculated by this indicator, its overall performance within the poor African context is notably lower compared to other regions.

There is no doubt that a lot of efforts has been made to support and promote the environmental aspects of the Egyptian industry in general. At the policy level, there is a convergence between environmental and industrial policies as expressed in the Industrial Development Strategy 2016-2020 and the National Strategy for Cleaner Production for Egyptian Industries (2004) and sustainable development policies outlined in the Sustainable Development Strategy: Egypt Vision 2030. Within the framework of the industrial development strategy, the Ministry of Trade and Industry implemented the project of transferring environmentally friendly technology to the Southern Mediterranean countries in cooperation with the United Nations Industrial Development Organization, where it provided technical services to 26 companies in the sectors of chemical industries, food and beverage industries, and textile industries. Among the notable policies aimed at mitigating the climate change impact is the policy of expanding the production of renewable energies, which was manifested in solar energy projects in Benban, Kom Ombo in Aswan and Assiut, and wind energy projects in Zafrana and Jabal Al-Zeit. A project has been implemented to raise energy efficiency in industrial activities (2013-2018), and a project was

undertaken to benefit from solar energy in heating processes in factories (2014-2022).

In the field of the transition to green industries, a recent report by the Information and Decision Support Center reveals that, as of 2020, there were 51 garbage recycling factories, 24 green economy factories, and 421 sewage treatment plants. This report also highlights the government's aim to initiate 14 green projects during the period 2023-2030. Notable among these projects are solid waste management projects, projects to produce new and renewable energies, projects to produce bioethanol and produce biofuels from algae, and projects to produce biodegradable plastic.

In the field of legislation, it has been noted that the procedures and criteria governing the issuance of licenses for industrial establishments that have been in force since the issuance of Law No. 4 of 1994 and its executive regulations in 1995 have undergone enhancements reflected in the updated procedures and criteria outlined in Law No. 15 of 2017 and its executive regulations. These revisions aim to facilitate the procedures for granting licenses for industrial projects. The General Authority for Industrial Development also issued the Guidelines for the Practice of Low-Risk, High-Risk, and Micro-Industrial Activities in March 2018, and the Guidelines for the Preparation of the Environmental Presentation Study in November 2019. In 2020, Law No. 202 on the regulation of waste management was issued. Law No. 72 of 2017 on Investment has taken into consideration aspects related to environmental protection and public health by providing an incentive in the form of a deduction of 30% from the net profits subject to taxation based on the investment costs for projects utilizing new and renewable energy sources, as well as for projects producing such energy, and waste recycling projects.

Concerning environmental management procedures, the assessment of the environmental impacts of industrial activities is one of the most important procedures that must be carried out before implementing an industrial project. However, fulfilling this procedure does not negate the importance of studying the environmental conditions of these facilities after their operation, to avoid any potential environmental risks, and through which it can be ensured that the environmental safety and security requirements of the industrial activity are met.

Despite the mentioned efforts to address the environmental dimensions of Egyptian industry, the indicators about the environmental status of Egyptian industry and Egypt's low ranking on several international environmental indices, linked with the limited awareness of Egyptian industrial facilities regarding the

importance of environmental aspects, especially in terms of monitoring carbon dioxide emissions and energy efficiency, underscores the need for the development of policies, legislations, and environmental management procedures to enhance the environmental performance of the industrial sector.

7. Legislative and regulatory dimensions of deepening industrialization

First: Legislation

In Chapter five, an examination and critique were conducted on ten laws pertaining to the industrial sector.

- Law No. 15 of 2017 on Facilitating the Procedures for Granting Industrial Establishments Licenses.
- Law No. 72 of 2017 on Investment Guarantees and Incentives.
- Law No. 95 of 2018 from the Industrial Development Authority.
- Law No. 70 of 2019 regulating the Egyptian Industries Union and Industrial Chambers.
- Law No. 11 of 2018 pertaining to the Regulation of Restructuring, Protective Reconciliation and Bankruptcy.
- Law No. 5 of 2015 regarding the Preference of Egyptian Products in Government Contracts.
- Law No. 90 of 2018 amending provisions of Law No. 5 of 2015.
- The Economic Courts Law No. 120 of 2008, and its amendments by Law No. 146 of 2019.
- Real Estate Tax Law No. 196 of 2008, as amended by Law No. 23 of 2020.
- Law and basic order of the Industrial Development Bank.

The following are the main findings of the research on the legislations related to the deepening of industrialization, in addition to the proposals apart from those mentioned in chapter thirteen.

- The Supreme Council for Planning and Sustainable Development coordinates economic laws and legislation, supervises the regulatory reform process, and ensures the quality of legislative tools and their consistency with the sustainable development strategy.
- Continuous efforts to update the "electronic record of legislation" with successively issued legislative tools, and working to expand its availability to various individual and institutional users, while improving the service

according to a specific time plan, in order to raise the level of legal awareness in society.

- Enhancing fair market competition in the Egyptian market by providing local manufacturers with the proper legislative framework for competition and avoiding monopolistic practices.
- Reviewing existing legislation, regulations, and decisions with the aim of codifying support for deepening the industry, and monitoring the government agencies' preference for local products in their purchases and their commitment.
- Generating public revenues through the modernization of outdated fees specified in laws that have been in effect for over ten years.
- Streamlining the procedures for granting licenses to industrial establishments under Law No. 15 of 2017, because the articles of the law have responded by adhering to traditional aspects. However, some efforts by the administrative authority, represented by the General Authority for Industrial Development, aims to settle violations for industrial facilities, rather than simplifying procedures, and implementing system of participation, and fostering collaboration between the authority, manufacturers and investors.
- The necessity of encouraging an ongoing dialogue between investors and government authorities, considering the opinions of investors prior to decision making, to meet their needs and priorities, and upholding the principle of participation in the decision-making process. This is in addition to responding to investor inquiries, and addressing their complaints effectively. All this can be achieved by implementing effective systems to receive complaints inquiries, and suggestions from investors, and dealing with complaints efficiently, and taking actions to prevent their recurrence.
- The need to address the refusal of some tax authorities to allow tax installment payments and insistence on collecting the tax at once or freezing corporate funds in banks to compel financiers to pay, bypassing any legal avenues for resolution, without considering the economic situation of the entities and their reputation, which may be affected by the bank freeze, leading to numerous disputes and conflicts.

Second: The Regulation

Chapter Six dealt with many local, regional, and international experiences regarding the strategic and governance dimensions of deepening local industrialization issue, which resulted in some initial results and trends, the most prominent of which are the following:

- The global sustainable development goals, the Fourth Industrial Revolution, and the Coronavirus pandemic represent key frameworks and governing and influential variables that had greatly impacted addressing the governance and deepening of industrialization across most countries of the world.
- There is interest in the role of medium, small, and micro-enterprises in industrial development and deepening industrialization, focusing on improving the legislative and planning conditions along with bolstering institutional and procedural roles supporting this type of project.
- Egypt seems to be far from the strategic planning approach of the industrial sector in Egypt in general, and the deepening of industrialization in particular, whether due to the absence of coherent plans and policies or their inconsistent and discontinuous nature.
- The diversity of institutional roles and legislative and procedural approaches to the governance of deepening industrialization issues among stakeholders in Egypt, with the absence of a comprehensive context or framework for integration and coordination.
- There are gaps in national policies targeting deepening specific industries according to agreed development priorities. This stands in contrast to numerous international experiences observed in both developing and developed countries.

Among the most prominent proposals presented to improve the institutional framework and regulatory arrangements for the industrial sector are the following:

- Activating the role of the Supreme Council for Planning and Sustainable Development in carrying out its planning, coordination, advisory, and motivational roles, developing industrial policies and following up their implementation to promote and deepen the industry.
- A detailed proposal regarding the entities affiliated to the Ministry of Commerce and Industry, including the merging some of these entities together, due to convergence or overlap of their competencies, the transfer

of the authority of some entities to other ministries more appropriate to their functions than the Ministry of Commerce and Industry, and separating some entities from the Ministry of Commerce and Industry either because they provide their services to various ministries and entities, or due to their supervisory roles that necessitate their independence from the executive bodies.

- Develop a new legislative framework for the Egyptian industry with a primary emphasis on its contribution to sustainable development in Egypt within the framework of the Fourth Industrial Revolution, and on strengthening the local component in Egyptian industry and enhancing its competitive advantages, supported by some specialized legislation such as legislation on deepening industrialization, and legislation on innovation and technology transfer.

8. Technology, innovation, and linking research and development to industry

First: Technology and Innovation Policy

Among the most prominent findings of chapter seven, addressing technology and innovation policy, are the following:

- Innovation is a central element of any development strategy in our time.
- Innovation is not limited to the process of transforming science, knowledge, and technology into economic value in the form of goods and services, but it goes beyond this narrow concept - despite its great importance - to form an essential means of addressing societal problems in all aspects of life.
- Innovation policies transcend the technological policy of the country, aiming to create a healthy and stimulating environment for the process of converting technology into economic value, the establishment of new technological companies, and ensuring the success of both national and foreign companies operating in the country contributing to sustainable economic growth. Accordingly, technological policies have become an integral component of innovation policy aimed at the production, transfer, and transformation of technology into economic values.
- Egypt ranked 94th out of 132 countries according to the 2021 Global Innovation Index which indicates Egypt's significant lag, especially if we know that all Arab countries preceded Egypt except Algeria and Yemen. Comparing Egypt's performance in 2015 and 2021 based on the elements of both the Innovation Input Index and the Innovation Output Index, it was

found that it has made good progress in knowledge and scientific research outputs, primarily measured by the amount of scientific production in the international scientific journals and conferences. On the other hand, its ranking in the Creative Output Index, which is measured by creative products and services, experienced a decline. This is not surprising as the Ministry of Higher Education and Scientific Research has pursued a policy of stimulating scientific publishing by rewarding researchers and faculty members financially whenever their scientific production increased by publishing in international scientific journals while neglecting to measure the broader impact of this scientific production on the industry, the economy, and society in general.

- The fundamental principle in technology and innovation policy is to be a comprehensive national policy, while acknowledging the existence of sectoral policies, that should be driven from a comprehensive national technology and innovation policy. Only a national policy is capable of shaping cross-sectoral trends and introducing new concepts and visions, including redefining the role and mission of universities in society. It has the capacity to foster cooperation between universities and industries, enhance business environment, and encourage technological companies to engage in research and development activities through tax incentives and other tools.
- In Egypt, despite a prevalent focus on innovation across various sectors, there is no officially documented national innovation and technology policy. It is worth mentioning that both Egypt Vision 2030 and the structural reforms program lack specific technological policies, but serve as governing framework that pushes toward specific policies and directions in terms of technology and innovation.
- The full cycle of innovation requires an efficient national system and a comprehensive national policy for innovation, technology, and science issued by a higher council empowered to coordinate between different sectors of the country, fostering collaboration. This entity should possess the authority to monitor and ensure the implementation of national policy mechanisms. Therefore, it is recommended to develop an integrated system to develop the national policy for innovation, technology, and science and for monitoring and ensuring their implementation. It is stipulated that this system is led by a supreme council deriving its authority from the presidency of the executive power.

- The state shall adopt a clear technology policy within the framework of the comprehensive national policy for innovation, technology, and science, which shall include mechanisms and tools that stimulate and encourage the possession and development of technology domestically. It is suggested that this policy prioritize future technologies and high-value-added industries. Notable examples of such technologies and industries are biotechnology, new energy technologies in particular hydrogen power generation, manufacturing of semiconductors, nanotechnology, artificial intelligence, and other innovations from the Fourth and Fifth Industrial Revolutions.
- It is crucial for the state to adopt a broad concept of deepening industrialization that incorporates product development and design locally. Merely manufacturing the product's components locally does not guarantee the ability to develop them without outsourcing, and often the design element constitutes a significant portion of the added value.
- One of the most important challenges hindering innovation in Egypt is the migration of tech startups and brain drain. Therefore, the government must invest substantial efforts to re-attract Egyptian technology companies and expertise from abroad through well-designed and well-financed programs, coupled with a focus on enhancing the scientific research system, technology, and the business performance environment.
- It is essential to draw upon the experiences of other countries in the field of technology transfer from universities to industries and to redefine the role of universities and research centers as hubs for knowledge and technology transfer to society, production sectors and services. Researchers in universities and research centers represent a knowledge army that engages in the battle of innovation alongside industry. Therefore, there is a need to reconsider the regulations governing universities and research centers and review the promotion criteria for researchers and faculty members to align with their contributions in the innovation battle. Additionally, it is imperative to evaluate the performance of these institutions and their staff in terms of successfully transferring knowledge and technology to society evidenced by patents and new technologies, and assessing the developmental impact thereof, is crucial. This evaluation should also consider the role of these institutions in providing modern education and training to equip individuals with the skills necessary for innovation and advancing the industry, ultimately transforming Egypt into a knowledgeable society capable of achieving sustainable and comprehensive development.

Second: Linking scientific research, development, and innovation to industry

The research, development, and innovation system in Egypt suffers from structural imbalances that must be taken into account when formulating policies to deepen the industry and its programs. Universities and other higher education institutions in Egypt are the driving force of research outputs and the main source of human resources for scientific research and development. Government research centers rank hold the second position in its importance, while the contribution of research centers within the productive business sector declines significantly, as do non-profit civil society organizations. This contrasts with the prevailing model in countries that have made tangible achievements in scientific research and innovation on one hand and industrial development on the other. Egypt's indicators related to the connection between scientific research and innovation production institutions and the industrial business sector exhibit deficiencies. To address these issues and recognizing the crucial role of this connection in effectively translating innovations into industrial products that meet present and future societal needs, there is a need for coordinated policies and measures. These efforts aim to enhance the capacity to make the Egyptian economy more globally competitive.

According to the database of the Egyptian Observatory for Science and Technology, the ratio of research and development spending to GDP increased from 0.43% in 2009 to 0.74% in 2018, but it is still lower than the 1% target set by the Egyptian Constitution in 2014, and fall shorts the international standards. It is noted that about 80% of research and development funding in Egypt comes from the government sector with weak participation from the private sector compared to the rest of the world. However, there has been progress in the capabilities of the human resources as evidenced by the rising number of scientific research published in peer-reviewed international journals, participation in international research projects, the receipt of international awards, or in holding prestigious scientific positions. In terms of participation in international research projects and receiving international awards or holding prestigious scientific positions, it is worth noting that most patent applications came from companies at a rate of 50.8%, followed by individuals at 38.6%, and then research centers at 8.5%. However, universities' share, while still modest, increased to 2.1% in 2019. This share is higher compared to 2009 (0.4%) and 2017 (0.13%). As for the overall innovation linkage index, which measures Egypt's performance based on sub-indicators related to collaboration between scientific research and universities, industry, technology incubators, foreign-

funded research and development expenditure, and patents, Egypt's ranking improved between 2017 and 2021, from 113th in 2017 and 2018 to 65th in 2021.

According to the National Strategy for Science, Technology, and Innovation document issued by the Academy of Scientific Research and Technology in 2017, several key challenges that prevent close linkage between scientific research, innovation, and industry institutions in Egypt were identified. These include:

- Weak infrastructure and information necessary for the development of scientific research, along with limited databases of various research institutions.
- The predominant focus of most universities and research centers efforts on scientific publishing for the purpose of promotion, and researchers don't exert sufficient effort to obtain contracts with industry to develop them through scientific research.
- Lack of adequate budgets' allocation for scientific research, and weak spending on research and development in most universities and research centers.
- Lack of marketing of Egyptian universities and research centers as proficient entities hindering broader participation in development and technological projects.
- Some scientific and research institutions in Egypt lack intellectual property policies that regulate the relationship between institutions and the researchers working for them.
- Successful industrial companies rely on a "turnkey" system from foreign countries, resulting in a lack of interest in research and development by local research institutions.
- Difficulties and delays in patenting procedures and intellectual property rights, and lack of support for inventions addressing national industry-related issues. Lack of funding and incentives for technology transfer from research institutions, and lack of involvement of industrial companies and the private sector.
- Lack of trust between universities and most industrial companies, results in some enterprises not recognizing the value of industrial research and innovation by research institutions.
- The law regulating universities does not allow the marketing of innovations, and the many legislative obstacles facing Egyptian public universities and research institutions in supporting startups.

- Despite the existence of institutions and entities for the transfer and marketing of technology from scientific research institutions such as offices for the marketing of industrial innovations, the weak links between them stem from lack of cooperation and coordination between different initiatives, along with the high cost of technology transfer.

One of the most prominent findings of the research on linking commodity and service production institutions with research, development, and innovation centers in support of industrialization and its deepening, inspired by practices in developed countries, is the proposal of an initial vision based on moving in two tracks. The first track seeks to support research and development in industrial institutions by establishing research units in companies and fostering a culture of research and development at the level of the productive sector. Moreover, it provides research-oriented workforce in industrial units by engaging university professors and researchers in research centers to work part-time in factories and appointing university graduates holding Master's and Doctoral degrees. The second track is the adoption of a national strategy for knowledge and technology cooperation between industry, universities, and research and development centers, and the adoption of policies based on the concept of "knowledge transition", by activating three main directions. The first direction is concerned with establishing a modern research infrastructure in universities or research centers that supports the knowledge transition between the university and industry according to the style of research hubs or technology valleys. The second direction seeks to adopt policies to support the transfer of knowledge and technology from multiple sources. The third direction focuses on establishing virtual or real networks for research cooperation and innovation initiatives with industry, for example, by establishing central laboratories in universities to serve industry in general, and establishing strategic industrial cooperation aimed at deepening industrialization in particular.

Chapter eight presents a proposal aimed at affirming the relevance of research, development, and innovation institutions to the requirements of national industry sectors and deepening local industrialization. This proposal is based on a four-dimensional conceptual structural framework.

- The first dimension is concerned with developing units for research and development in the productive business sector for medium and large-sized industries and supporting contracting with a research center in the case of small-sized industries with minimum potentials, as well as supporting the

productive sectors with skilled workforce and fostering the competencies of research and development and cognitive skills.

- The second-dimension deals with the partnership between industry, universities, scientific research institutes, and innovation centers in developing a research infrastructure aligned with the knowledge revolution of the third millennium and contributes to linking knowledge production institutions with the productive business sector and industrial companies.
- The third dimension focuses on the expansion of the development of industrial cooperation for innovation, and "technology and industrial innovation" centers.
- The fourth dimension is concerned with choosing the optimal combination of formal and informal channels for knowledge transfer, along with the corresponding set of policies for its implementation. It is proposed that the Ministry of Commerce and Industry, the Ministry of Higher Education and Scientific Research, the Academy of Scientific Research and Technology, and institutions specialized in the development of industry contribute to the provision of the legal and regulatory environment, and the formulation of the necessary executive plans and programs to activate these dimensions. Indeed, the conceptual structural framework will only work if there is a set of policies and mechanisms to advance scientific and technological research and strengthen the links between scientific research and innovation institutions and industry, with a focus on the objective of deepening local industrialization. Chapter eight has outlined these policies and mechanisms, which include policies and mechanisms for creating a stimulating and supportive environment for research institutions, policies and mechanisms for funding, financial support and stimulation for research institutions and industrial companies, policies and mechanisms for directing research to serve the processes of deepening industrialization, and policies and mechanisms for strengthening the link between research institutions and industrial companies.

9. Technical and Vocational Education and Training

One of the main pillars for the advancement and deepening of industrialization is the preparation of industrial technical cadres that meet the requirements of various industrial establishments, the continuous professional development of the industrial workforce in order to keep pace with rapid technological changes, the consolidation of industrial work values and awareness

of the importance of adhering to occupational health and safety rules and preserving the environment at production sites. These are all tasks that Technical and Vocational Education and Training is expected to accomplish.

Egypt's Technical and Vocational Education and Training map has a total of approximately 2.5 million students, about 2 million enrolled in formal technical education run by the Ministry of Education and Technical Education. Upon completing three years of study, students are awarded a technical diploma. Students who successfully complete five years receive an Advanced Technical Diploma. There is a formal technical education under the Ministry of Higher Education provided by the newly established technological colleges and universities, with about 150,000 students. There is also a formal technical education at the Department of Productive Efficiency of the Ministry of Trade and Industry with about 30,000 students. There is also a regular technical education at the Ministry of Health for the education and training of nurses, consisting of about 60,000 students. In total, formal technical education has approximately 2.2 million students, while about 300,000 students are enrolled in vocational training and non-formal technical education in the ministries of manpower, housing, and others, where the students receive training that helps them get a job without being certified.

The most prominent findings of chapter nine which includes the evaluation of the existing system in Egypt for technical and vocational education and training in general and the sector related to the industry, in particular, reveals several significant findings: the absence of a valid law for technical and vocational education and training, legislative fragmentation, the absence of a national vision and plan for industrial education and for the training needs of the industrial sector, the complexity of the technical and vocational education and training system, weak coordination, follow-up and evaluation, lack of training of trainers, the lack of diligence of industrial companies to fulfil their obligations in joint training projects, and the lack of transparency in funding mechanisms and support for partnerships between the private and the public sector and the entities concerned with industrial education and training.

A survey of a number of experiences has shown that there are several main components of effective industrial education and training, the most important of which are:

- Providing multiple industrial education and training programs that can swiftly adjust to changes in the demand for technical skills in the labor

market, while allowing the implementation of training programs in the workplace or industrial education and training institutions or a combination of both.

- Provide lifelong industrial education and training opportunities, with an emphasis on vocational and career guidance and counselling.
- Establishing integrated systems for the preparation and training of industrial workers (universities – institutes – schools – training centers) in areas of deepening industry and establishing a group of industrial education schools and industrial training centers in geographical areas where activities will be carried out to deepen industrialization, and equipped properly.
- Implementing a national qualifications framework.
- Developing the governance of industrial education and training institutions by forming independent boards of directors capable of making decisions and conduct work in line with the goal of deepening industrialization.
- Providing a legislative framework covering the legal, financial, and administrative aspects in line with the requirements of implementing the trends of expanding and deepening the scope of industrialization.
- Providing a reliable and transparent information system for the industrial labor market, in order to assist the graduates of industrial schools and centers, as well as employers, in making sound decisions.

Some of the key proposals presented for the advancement of technical and vocational education and training based on lessons learned from international practices are as follow:

- The need to transform the strategy launched by the Ministry of Education and Technical Education in March 2022 into an action plan with specific programs, adequate funding, and rigorous monitoring and evaluation of educational and training programs.
- Engaging the private sector in shaping industrial education and training policies and encouraging its participation in projects undertaken by the Ministry of Education and Technical Education.
- Expanding the application of on-the-job training and providing financial and non-financial incentives to encourage companies to participate in education and training projects.
- Forming small groups of companies to participate in train-the-trainer programs.

- Expanding vocational education within technical schools to generate a skilled workforce.
- Establishing a practical model for applied technology schools to ensure the effectiveness and sustainability of private sector participation.
- Adopting a model that delegates the management of some industrial schools to groups or associations established by the private sector.

10. Fiscal and monetary policies in support of deepening industrialization

The examination of international experiences reveals that the key financial strategies employed to foster industrial development and deepen industrialization, particularly in the initial stages of industrialization, include:

- Protecting local industries through high customs tariffs, in addition to imposing quantitative restrictions on imports, and prioritize imports of capital goods and production inputs.
- Providing support to boost exports, in some cases linking this support to specific conditions related to the local component or technological level of the exported products
- Impose a tax on exports of some industrial inputs necessary to deepen some local industries.
- Reducing investment and production costs, especially for pivotal industrial projects, by providing industrial land and utilities at reduced or no cost. This involves decreasing the rental value of units in industrial complexes, refunding part of the land transfer fees, partial or total exemption energy consumption charges, and partial or fully refunding of value added tax or customs duties.
- Stimulate local and foreign investment through tax deductions or exemptions. In some countries or phases, these incentives may be tied to performance in export activities, utilization of local components in manufacturing, or labor training and technology transfer.
- Among the mechanisms that have been used as supplements or alternatives to tax incentives are giving advantages to foreign investment, such as reducing restrictions on foreign ownership, facilitating business operations by reducing the cost of government-provided services to investors, and offering grants or financing to companies to enhance their research and development capabilities or support employee training and skill development.

Regarding the balance between providing tax incentives and improving the investment and business environment, although combining investment incentives with investment-friendly environments is considered one of the best practices, it is not recommended to generously provide tax exemptions. It has become evident over time that their effectiveness is limited compared to the benefits of improving the investment and business environment. Additionally, there is a need to broaden the tax base and increase tax revenues to finance public expenditure, including enhanced industrial development expenditure.

With regard to the use of monetary policy tools in advancing and deepening industrialization, chapter ten focused on three tools: interest rate, the exchange rate, and development banks. An examination of international experiences revealed that the effective use of monetary policy tools was characterized by the following:

- **Selectivity:** This means adopting multiple interest rates based on the priorities of the industrial development strategy, in line with the nature of the targeted industrial activity to expand or deepen, and based on the size of the industrial facility and its geographical location.
- **Dynamic:** This implies that support through interest rates and preferential exchange rates or through the provision of concessional financing by development banks is temporary. It should cease once the intended objectives are achieved.
- **Suitable institutions**: The establishment of permanent financing institutions, with sufficient and stable financial sources, and their primary competence is to provide financial support to industries prioritized in the industrial development strategy.

Analyzing the role of monetary policy in supporting and deepening local industrialization in Egypt reveals its limited impact, mainly manifested through initiatives launched by the Egyptian Central Bank that have been tied to specific financial allocations disbursed within a limited period. These initiatives lacked selectivity, as they aimed to support industrial growth in a general sense without distinguishing specific industrial activities, contributing to deepening industrialization. The exception in this regard was the distinction by size of establishments. There are multiple challenges facing financing the industrialization in Egypt including the lack of long-term industrial financing mechanisms for innovative, high-risk, capital-intensive, or technology-intensive activities, especially in the absence of a robust role for Egyptian development banks. These include the lack of attractiveness of interest rates for industrial investment, even after reductions within the framework of the central bank's

initiatives, compared to industrialized countries, including the crowding out of government investments to the private investments in relation to available sources of financing. Maximizing the role of monetary policy in achieving the objectives of deepening local industrialization in Egypt requires taking into account the following considerations:

- Priority should be given to facilities that are directed to support activities to deepen local industrialization in particular and to be distinguished from those aimed at stimulating industrial growth in general.
- The need to provide mechanisms for long-term financing in industrial activities that are a priority for deepening local industrialization and may not be affordable for commercial banks to finance. This requires a comprehensive review of the role of Egyptian development banks, especially the Industrial Development Bank to ensure that these institutions can assume equivalent role aligned with Sustainable Development Goals and keep pace with international practices.
- Providing a range of additional financing facilities for the industry, such as providing liquidity to industrial establishments by promptly settling the dues and debts of enterprises with the entities affiliated with the Ministry of Finance, reviewing and resolving the debts of some industrial establishments with government departments, and developing alternatives to finance the occupation of industrial lands based on the size of investment and the nature of industries.
- The necessity to integrate monetary policy with other policies aimed at achieving industrial development and deepening industrialization, especially fiscal policy, while taking into account the significant budget deficit of the country that poses a constraint on monetary policy, as the attractiveness of investing in low-risk, guaranteed-yield government debt instruments weakens the inclination of banks to lend industrial sectors, especially those characterized by high risks or requiring long-term financing.

The decision-making process related to development in general and to industrial development, in particular, appears to give more weight to fiscal policy than monetary policy. It is noted that no special attention is paid to industrialization deepening in both fiscal and monetary policy, with the exception of the provision in the Investment Law of greater incentives for industries feeding the automotive industry. In general, the desired effects of industrialization and its deepening of both fiscal policy (especially by providing tax and customs exemptions) and monetary policy (especially by lowering the interest rate or

exchange rate) may not materialize concretely, not necessarily because of an inherent weakness in these tools, but because of legislative, regulatory, procedural and other obstacles that make the investment and business environment a discouraging environment for industrial investments. The effectiveness of fiscal and monetary policies faces limitations imposed by some practices favored by the neoliberal approach (Washington Consensus), such as the reliance on tariffs alone and the avoidance of quantitative restrictions for the purpose of controlling foreign trade. Other examples include the adoption of a unified exchange rate, determined by market forces, forsaking exchange rate pluralism and other methods of exchange control in line with the established sectoral priorities. These practices deviate from successful historical experiences in the development and deepening of the industry.

Industries nominated for deepening and industries to be developed as a basis for deepening.

Industries eligible for deepening were identified in chapter eleven based on five criteria:

- Strengthening industrial linkages, to increase the degree of productive integration of the Egyptian economy.
- Increasing the level of self-reliance, to reduce external dependence.
- Increasing exports.
- Generating increased employment opportunities.
- Accelerating the process of transitioning to a Green Economy.

Based on these criteria, an initial list of ten industries or groups of industries was compiled, subject to potential modification or refinement to reach a final list. This list was derived after extracting sectoral indicators through an analysis of the latest input-output table for the Egyptian economy that was available at the time of conducting this study, resulting in five identified industries for deepening the industry. The list expanded to seven industries with the addition of sectors deemed important for health and food security This number then rose to fifteen industries after the addition of other industries mentioned in the national program for deepening the industry and in the program of structural reforms. As some of these fifteen industries are sub-industries of other of the ten industries included in the preliminary list, the final count was streamlined to nine industries by incorporating sub-industries into broader categories. These nine industries were found to be among the ten industries initially nominated for deepening. Using the results of three studies on promising industries from an export perspective, eight of the ten industries were found to

have this status, validating the accuracy of the initial selection of industries eligible for deepening.

The next step was to form a comprehensive overview combining the ten initially nominated industries with the five previously defined criteria. To help position different industries on the scale of deepening priorities, weights reflecting the relative importance of each criterion were identified, with two weight values assigned to each criterion. By applying these weights to the ten industries, the priority level of each industry was determined. It was found that:

- The metallurgical, chemical, textile, and garment industries were identified as deserving top priority for deepening. The second priority was assigned to the electronic, pharmaceutical, and food industries.
- The engineering and petrochemical industries were categorized as a third priority.
- The medical device industry and railways were designated as lower priorities.

With regard to the industrial and non-industrial activities that need to be activated or established in order to deepen each of the ten industries, the need to develop agricultural activities, extractive industries, and multiple industries was mentioned in details in Table (6) in Chapter eleven.

Conclusion of the research on approaches to solve the problems of deepening industrialization.

Chapter thirteen outlined the challenges hindering the deepening of industrialization in Egypt, and the proposed solutions to face these challenges. These proposals were formulated based on insights from four sources.

The first source is the workshops, seminars, and other scientific meetings held by the project, in which information, opinions, and suggestions were shared by industrialists from the private sector, and from the public sector, both civil and non-civil, experts, academics, former officials in the industrial sector, and representatives of the industrial chambers of the Egyptian Industrial Union. The second source is the working papers specifically prepared to cover the main issues of the project, as well as conducting a number of case studies to investigate the depth of some industries and to suggest ways to increase this depth. The third source is the field visits conducted by the authors of some of the project's working papers to some industrial facilities and research and development centers, and the discussions with management and the experts. The fourth source is sources of additional materials related to deepening industrialization, especially seminars

and publications of some scientific centers, some press coverage, and recent statements by officials of the industry sector, as well as some relevant laws and recent decisions.

Many of the challenges facing industrialization deepening are greatly impacting industrial investment as a whole. This is not surprising, as investment in industrialization deepening is a type of industrial investment that focuses on producing the necessary local alternatives to some imported machinery, equipment, raw materials, and other production requirements, as well as manufacturing technologies. In addition to the challenges discussed in chapter three and in part two, the challenges derived from case studies of five industries tackled in chapter twelve-namely, car manufacturing, solar panel production, plastics industry, pharmaceuticals using medicinal and aromatic plants, and vegetable edible oil manufacturing – will be highlighted here.

Case studies have shown that the most important problems facing the deepening of local industrialization in Egypt are as follows:

(1) The absence of a national industry strategy linked to both the New and Renewable Energy Strategy 2035 and the National Science, Technology, and Innovation Strategy 2030.

(2) The complexity of current legislation and administrative and bureaucratic procedures is one of the most important factors in not attracting investors, but rather their fear of transferring their activities to Egypt. At the forefront is the inefficiency of legislation in general, and that regulating import and export operations in particular. Additionally, the complexity of tax and tariff problems that do not align with recent developments in their fields. Other challenges include the lack of smooth application of incentives and obtaining the necessary permits, the existence of obstacles regarding compatibility with standards and specifications, certifying of devices and obtaining the approval of the Investment Authority for the establishment of regional offices, as well as the difficulty of obtaining the land necessary for establishing projects.

(3) The lack of market monitoring to provide the necessary protection for both foreign and local companies, has given rise to a parallel market for counterfeit and smuggled goods that are traded commercially outside the purview of inspection and regulation authorities. This phenomenon has, at times, led to significant losses in domestic production. This issue can be partially attributed to a large percentage of factories operating in the informal sector, for various reasons, including the dominance of tax considerations over efforts to integrate these factories into the formal sector. Undoubtedly, the informal sector has

various negative effects on the Egyptian industry, including the absence of fair competition, weak protection of intellectual property rights, and a detrimental impact on the reputation of Egyptian exports. All of these factors have a negative influence on attracting foreign investments and the continuity of serious domestic investors in Egypt.

(4) The lack of documented and announced detailed databases on existing industries in Egypt and on the movement of retail trade in various activities carried out by local and foreign private sector companies is one of the most important obstacles to preparing accurate feasibility studies for various industrial projects and one of the factors hindering interaction and integration between Egyptian industries.

(5) Limited budget allocated to spending on scientific research in Egypt in general, and directed to specialized industrial research centers in particular, with poor linkage between industrial and scientific research facilities in Egypt. It is noted that insufficient attention is paid by scientific research and technological development policies to the conduct of applied research and the transfer of its results to local manufacturers. It is also noted that some efforts in the field of supporting scientific research activities depend mainly on grants provided by international institutions and organizations, with a tendency of these efforts to slow down or cease once the grants are exhausted and the donor institution withdraws.

(6) Inadequate financing policies for the private industrial sector coupled with obstacles that hinder their implementation. Repeated exposures of producers to the problems of devaluation and deficits in the dollar supply disrupt production processes and raise cost levels.

(7) The small size of the local market is one of the obstacles facing different industries and hinders raising their level of competitiveness. In addition, most of the private sector establishments operating in the industrial sector in Egypt fall under the list of medium, small, and micro-enterprises. State enterprises and the public business sector also face operational limitations. These factors limit the scale of production, leading to increased production costs and reduced product competitiveness. It is worth mentioning that the components and production inputs suffer from poor direct investment, due to its reliance on sales to the local market and the absence of export outlets or difficulty in accessing them in most cases.

(8) High prices of transport, trading, and energy services. High energy prices in particular represent one of the main obstacles for both local and foreign companies operating in Egypt.

(9) Prohibition of local content/ component requirements under WTO rules is a barrier to integration with global supply chains because it ensures demand for feeder industries rather than having to compete with other manufacturers in the global market.

(10) The Customs Authority and the General Organization for Export and Import Control face challenges in accurately identifying the imported items in accordance with the international system (HS Code), and the existence of many difficulties in the procedures for examining imported raw materials, components and devices with prolonged examination period, and delayed release of these raw materials from customs. The industry may be adversely affected by decisions to impose dumping duties on some imports of raw materials, despite insufficient domestic production, and despite differences between imported types and local counterparts, as well as significant price disparities between local and imported products.

(11) The weak environmental performance of the Egyptian industry and the need to improve it is an essential goal and a key element to support competitiveness. Additionally, there is a lack of environmental awareness within the industrial community due to the prevalent misconception among most manufacturers that environmental considerations are associated with high-cost investments, leading to increased product costs and, consequently, higher prices compared to competitor products.

The following are the highlights of the report's proposals to address the obstacles to deepening industrialization in Egypt:

I. Strategic Issues, Priorities and the Role of the State

Addressing many of the deficiencies in the performance of the Egyptian industry and the imbalance in priorities requires starting from a new strategy for development in general and for industrialization in particular, which in turn starts from a new philosophy of development and the state’s role in achieving it. The proposed development philosophy is the self-reliant developing country. The core of this philosophy centers on comprehensive, equitable, and sustainable human development that depends on the subjective forces of the Egyptian society in the first place, especially the reliance on the human and natural resources of society, and on the development of its saving capabilities to the maximum level. The

emphasis on deepening industrialization as highlighted in the report is a genuine embodiment of the principle of self-reliance. The proposed philosophy/model of development is based on six pillars; the first is the advancement of the human and saving capabilities of the population, the second is the activation of the components of the developing country through comprehensive national planning, the third is participatory democracy and the fair distribution of income and wealth, the fourth is maintaining discipline of national economic relations abroad, and the fifth underscores the cooperation between the countries of the South in various fields, and the sixth is taking into account the requirements of sustainability in a broad sense.

It is important to formulate and deepen a strategy for industrialization in line with the six pillars of the proposed development philosophy/model, with a degree of relative stability, and not subject to frequent changes with shifts in leadership positions. As shown in chapter four, the problem facing industrialization and its deepening lies not only in the preparation of strategies and plans, but also in implementation, the availability of the will to implement by policymakers and decision-makers, the weak coordination between many devices related to the industrial sector, the absence of institutional linkage between these devices, and the weakness of follow-up and accountability for the planned initiatives.

Therefore, it is increasingly important to have a senior leadership that mobilizes efforts, unite stakeholders, foster coordination, and eliminate the fragmented approach that often leads to conflicts in directions and decisions and waste of resources. The report offers two alternatives for dealing with this problem. The first is outlined in Chapter Six, which suggests activating the roles of the Supreme Council for Sustainable Planning and Development as an institutional framework to perform its planning, coordination, advisory, and incentive roles regarding the creation, monitoring, evaluation, and adjustment of sustainable industrial policies and deepening industrialization in Egypt. The second alternative mentioned in chapter seven, which is the establishment of a **Higher Council for Science, Technology, and Innovation** led by the president of the country. This Council shall formulate and oversee the implementation of innovation, technology, and science policies that achieve the country's development vision and strategic objectives.

Concerning setting up a comprehensive plan for the development of local industrialization in priority sectors, the pivotal role played by the private sector should be highlighted. The government also has an important and essential role in the initial period to create, guide and control the environment that attracts

investments in the required fields. This requires the development of a comprehensive strategy for the development and deepening of local industrialization with an emphasis on increasing the volume of local and foreign industrial investments and providing more incentives and credit facilities to industrialists. Additionally, it is imperative to offer the necessary incentives to support the ability to adopt modern technology, the utilization of clean energy, improve quality, and increase research investments in those areas. This approach aims to enhance productivity and promote the production of modern and smart products, while considering the environmental dimension, and encouraging green initiatives to reach a more sustainable and green industry. Both the national sustainable development plan and the industrial development plan should be linked to the strategic plan for energy, with an assessment of the country's sources of renewable energy and their locations, and the identification of the economically viable options with high potential. Additionally, the selection of the appropriate type of technology is crucial to the development of these energy sources, through a well-structured timeline linked to a local industrialization program, with sufficient flexibility to modify both programs in response to the global and local conditions and developments.

Concerning the role of the state in industrialization and its deepening, it must be based on two principles. The first principle is the evolved concept of the developing country, in which the state is entrusted with leading economic growth and comprehensive development alongside the private sector. This places the developing role of the state in a democratic context based on the rule of law and ensuring popular participation in the planning and monitoring of development initiatives. This makes development a societal responsibility, not solely the government’s responsibility. The second principle is the key role of industrialization and its deepening in achieving development and ensuring its sustainability. The economic and developing role of the state is dual in nature. There is a primary role in the development of public policies, including industrial policy, aimed at stimulating the entanglements and forward and backward linkages between industries in various sectors, between industries in the public and private sectors, coordinating competing investments, and reducing the cost of transactions and business performance services. The second role involves the establishment of state-owned projects, particularly those with social return exceeding the private return. This includes infrastructure projects and the production of public goods, as well as industrial projects that the private sector may find challenging to undertake, due to high costs, the long gestation periods, the high risks, or externalities with no compensatory benefits to the private sector generated from the beneficiaries. In addition to the projects that represent natural

monopolies, as well as some projects of strategic importance from the perspective of food security, pharmaceutical security, etc.

As observed in several project workshops, the private sector was urging the government to establish projects in certain industries, citing its incapacity to establish them. The absence of these projects was seen as an obstacle to deepening industrialization. These projects can be established by the state alone or in partnership with the private sector, and even with the public sector. Incentives can be provided to encourage the purchase of shares in these projects by investors, whether institutions or individuals. The state can guarantee a minimum profit margin for participants, whether institutions or individuals, which exceeds the current interest rate by several percentage points. It is therefore important to recognize that emphasizing and deepening the role of the country in development in general and in industrialization, in particular, does not imply excluding or marginalizing the role of the private sector. One of the roles of the state is to encourage the productive private sector, as well as the cooperative sector and non-governmental organizations, to create a conducive investment and production environment for these parties, and to mobilize their efforts to accelerate the pace of the development process. Additionally, providing technical assistance to address technical challenges faced by private-sector factories and supporting initiatives to market their products internationally are roles that fall under the purview of the country.

It is also important that the revitalization of the role of the state in production and productive investment be accompanied by a program of administrative, financial, and technical reform of public sector projects, in order to remedy the decline in economic liberalization and privatization. It is essential to consider Article No. 34 of the Constitution that "public property is inviolable, and its protection is a duty in accordance with the law". Selling profitable public sector companies or relinquishing the state's stake in profitable companies with mixed ownership to local or foreign investors should only occur in cases of extreme necessity, given the available opportunities for both local and foreign investors to establish new projects, coupled with substantial incentives to do so. Regarding insolvent public sector companies, privatization is not justified as long as there are avenues for reform. As for companies that are definitively proven to be beyond repair after exploring possible avenues for reform, liquidation is a more prudent option. Concerning army-owned companies, privatization might not be necessary; instead, they can be transformed into public sector companies.

II. Technology Issues and Documenting the Links between Research, Development, and Innovation Links with Industry

Although efforts made to promote scientific and technological research stimulate innovation, and develop a strategy for science, technology, and innovation until 2030, there is still a need for a more precise formulation of a national strategy and policy for scientific research, technology, and innovation. This strategy should be derived from the proposed philosophy of development and is endorsed by the proposed Council for the Development of Industry, Technology and Innovation, which operates under the umbrella of the Supreme Council for Planning and Sustainable Development. The technology and innovation policy should be a comprehensive national policy, and any sectoral technology policies must emerge from this comprehensive national policy. It is also important to realize that the development of innovation policies extends beyond the technological policy of the country, encompassing all factors that helps to establish a healthy and stimulating investment and business environment to transform technology into economic value, namely, goods and services.

It is also essential in this regard for the country to have a **national system of innovation** that includes the main actors (such as universities, research centers, relevant government agencies, technology companies, etc.), This system should feature strong interconnections among these entities, coupled with specific policies of priorities, supported by programs and mechanisms to stimulate their implementation. As one of the lessons learned from international practices is that the importance of focusing on a limited number of sectors and technologies, emphasizing the need to avoid excessive sectoral and technological expansion in technology and innovation projects.

Since the gap between scientific research and industry is still wide and constitutes a major obstacle to the progress of many industries, it is proposed to adopt a national strategy for knowledge cooperation between universities, research centers and industry, and to adopt policies based on the concept of knowledge transfer encompassing three key elements. The first element is the establishment of modern infrastructure in universities and research centers according to the style of research resorts or technology valleys. The second is to adopt mechanisms to support the transfer of knowledge and technology from its multiple sources to the industrial sector. The third is to create virtual or real networks for research collaboration and innovation initiatives between industry, universities and research centers.

Among the mechanisms for linking scientific research and industry are the establishment of central laboratories in universities to serve industry, the establishment of what is known as industrial alliances or innovation alliances for the purpose of deepening industrialization, and the establishment of what are known as corporate universities, a strategy successfully implemented in Malaysia, which has had a prominent impact on its industrial and technological progress. One of these mechanisms is the selection of faculty research topics and graduate student thesis topics to meet the industry's needs for materials, equipment and technology currently imported, which assumes the availability of information that can guide the selection of research topics. It is crucial for universities and research centers to realize that their role goes beyond the scientific production and encouraging its publication in international scientific journals. Rather, this role should extend to interacting with industry to transform the outputs of scientific research into products and technologies of economic value. The activity of universities and research centers in this regard must be a key element in evaluating their performance. The rules for scientific promotions in these institutions must also include a distinct evaluation of researchers whose research leads to the development of new technologies or patents for products of high economic value.

Among the most prominent measures that can effectively promote research related to technology and innovation, ensuring its alignment with the needs of existing industries to solve certain problems are: improving the financial conditions of faculty members and researchers, allocate appropriate funding for research projects to support the potential of laboratories in universities and research centers, supporting distinguished graduate researchers in universities and research centers, and facilitating the pursuit of postgraduate studies for workers engaged in research and development activities within technological companies. This support can be structured in accordance with the joint supervision system between their companies and Egyptian and foreign universities. It is also proposed to motivate universities and research institutions to grant licenses for the use of their technology and intellectual property to establish or startup companies in exchange for a specified return. This approach contrasts with the practice of universities and research institutions establishing companies themselves to develop and market the outputs of scientific research, as they may lack a comparative advantage in this field. It is also recommended to encourage researchers in these entities to establish technology startups to develop and market the outputs of their research findings. It is also proposed to popularize the method actually followed by the Academy of Scientific Research and Technology, acknowledging the innovator's right to own their patent.

Given the low investment rate in research, development, and innovation by industrial companies and the fact that the vast majority of these companies lack research and development units, it is proposed to provide the state's support to increase the number of such units in industrial companies - especially relatively large companies - and to develop existing ones. Programs should be instituted to facilitate the exchange of scientists and researchers between academic and industrial domain. One of the good steps on the road to technical support for industrial facilities was the establishment of the Industrial Modernization Centre and the establishment of the Ministry of Commerce and Industry with a suitable number of technology centers. However, these entities need to develop their capabilities, expand their services, and evolve into centers of excellence with a primary role in transferring technologies to the industries targeted for deepening, and linking universities and research institutions with industry. More experts and technicians, as well as the appropriate material and technological capabilities are needed in both entities.

To deepen industrialization, it is necessary to pay special attention to three aspects. Firstly, design holds significant economic value within products, and because it has not received appropriate attention in past and current efforts to deepen industrialization. The second, is the importance of preparing for the Fourth Industrial Revolution, which requires targeting the national technology and innovation policy to produce some of the technologies of the Fourth Industrial Revolution and its solutions, or at least to participate in their production. Thirdly, there should be a focus on transferring expertise and increasing the contribution of the local component within the framework of government procurement contracts and the implementation of projects with foreign companies.

Last but not least, government technology centers should be developed into centers of industrial excellence. It is necessary to empower these centers with expertise and technicians in order to play an effective role in the transfer of technology necessary to deepen the targeted industries, and in linking research centers with those industries.

III. Legislative, Procedural, and Regulatory Issues

1- To address the evasion of the application of Law No. 5 of 2015 regarding the preference of the local product in government contracts, as amended by Law No. 90 of 2018, it is necessary to establish a mechanism for monitoring the compliance of all government entities with this law. Additionally, imposing deterrent financial penalties on entities that evade the legal requirement to notify

relevant procurement processes or contracts and those that circumvent the law by imposing conditions and specifications that cannot be met by local products or companies would be important. However, the greatest assistance in implementing the local product preference law will come through improving the quality of the local product and enhancing its specifications by intensifying research, development, and innovation efforts.

2- Laws and ministerial decisions must not remain in force without amendment or update for long periods, in order to avoid the difficulties that arise for producers, especially producers of new products. For example, some companies producing innovative products such as natural pesticides are unable to obtain support when exporting their product, due to a ministerial decision regarding pesticides that does not include this type of pesticides.

3- A special system must be established for the remuneration of distinguished experts and consultants in state-owned companies, research institutions, and supervisory and control bodies, coupled with controls to reduce the likelihood of nepotism and other forms of corruption and abuse, in order to avoid poor performance resulting from the standing of financial regulations as an obstacle to attracting distinguished technical and scientific cadres.

4- Some laws and regulations concerning public sector companies and economic and service entities that contribute to resource loss and missing opportunities to deepen industrialization must be amended. For instance, the National Railways Authority of Egypt and some companies specializing in railway "Amrat" accumulate large quantities of scrap needed by iron and steel factories as production requirements, but the regulations of auctions and tenders and their complex procedures prevent their disposal.

5-To overcome several obstacles in obtaining approvals and licenses, it is necessary to remove ambiguity in some provisions of the Licensing Law, which opens the door to different interpretations, while simplifying the relevant procedures, shortening their number, and reducing the implementation period. It is also necessary to facilitate the investment process for investors by expanding the authority of the Industrial Development Authority offices in the governorates, increasing the number of qualified employees in these offices, and delegating them to make decisions without referring to the headquarters of the Authority.

6-In order to alleviate the burden weighing on investors and encourage investment, it is necessary to amend text included in the Industrial Development Authority Law No. 95 of 2018, which designates the authority as an economic public body. This text negates this vital government entity of its service-oriented

nature for investors and portrays it as closer to a private company seeking profit. The national interest dictates transforming this authority into a service-oriented body not obligated to cover its expenses, let alone generate a profit.

7- The purpose of the investment map, as entrusted by Law No. 15 of 2017 on Investment Guarantees and Incentives to the General Authority for Investment and Free Zones, was to be prepared and updated every three years, its effectiveness relies on proper preparation and offering adequate information on possible projects in various regions This is done according to its resources, and comparative advantages, and preliminary feasibility studies. However, the practical benefit of the published investment map falls far short of the desired benefit, hence, it is necessary to develop the method of the investment map preparation to assist potential investors in choosing projects. The appropriate beginning for the desired development may be the amendment of the executive regulation of the Investment Law or the establishment of a special regulation that define specifications of the investment map and the method of its preparation.

8. There is still a need for a speedy disposition of cases, which requires the simplification and acceleration of case procedures on the one hand, and focusing on the appropriate economic rehabilitation of judges of economic courts, and ensuring their training for their duties on the other hand.

9. Regardless the circumstances that necessitated the issuance of Law No. 32 of 2014, which restricted appeals on contracts involving one party being the state or one of its central or local agencies or public bodies and institutions and state-owned companies to the contracting parties only, it became necessary to amend it, especially considering nine years have passed since its issuance. The amendment is necessary in order to resolve the conflict of this law with several principles stipulated in the Constitution, including those related to citizenship, the sovereignty of the citizens, the inviolability of public property, and the duty of every citizen to protect it. This is crucial to activate public oversight over government actions and protecting public funds.

10. There is a need to reconsider the security clearance procedures for foreign investors, as the current clearance duration is extensively long (up to seven months). It is suggested that the period should not exceed thirty days from the submission of the request. With regard to procedures, attention is drawn to the complex procedures faced by industrial enterprises - especially the medium and small ones - when dealing with customs and tax authorities. What complicates matters more, is that it is very common for procedures and instructions to be ambiguous and tolerate multiple interpretations. It is also important to adhere to

the use of the Harmonized System of Customs Nomenclature (HS Code), through the ACI "Advance Cargo Information system" - and any exceptions should be issued by the competent authority.

11. Aligning the standards of local industries with international standards, while providing technical assistance to factories and small workshops to obtain quality certificates facilitating the entry of their products to various global markets. Thus, it is essential to enhance the import inspection laboratories for production inputs to help speed up their release from customs ports.

12. With regard to the expenses incurred by industrialists and increasing production costs, Article No. 11 of the Real Estate Tax Law No. 196 of 2008 should be amended in order to exempt the buildings of industrial facilities and associated undeveloped land actively used from being subject to real estate tax.

13. Establishing a supreme council to coordinate laws and regulations related to economic and development issues. Among its primary responsibilities is to develop a new legislative framework for Egyptian industry, including legislation aimed at deepening industrialization.

14. Restructuring the Ministry of Commerce and Industry by merging some of its entities together, reassigning the supervision of some entities to other entities, or making them independent entities, so that the ministry devotes itself to its core functions.

IV. Labor, Education, and Technical and Vocational Training Issues

The establishment of applied technology schools within the framework of the partnership between the private sector and the Ministry of Education and Technical Education was a constructive initiative. To ensure the sustainability of these schools, a well-defined business model needs to be established. However, the gap in the field of training is too wide to be filled by this initiative, and more efforts are needed to enhance the performance of various training institutions.

The absence of a strategy and action plan with performance indicators to track progress in the implementation of the plan was a serious problem for Education, and Technical and Vocational Training. In March 2022, the Ministry of Education and Technical Education issued a strategy for the development of technical education. It is a well- conceived strategy, but its success depends on its effective implementation, integration with a national qualification system, and the improvement of governance in industrial education and training institutions by forming independent boards of directors with the active private sector participation.

Concerning developing the skills of national human capital, it is proposed to enter into strategic partnerships with countries and leading international companies in their respective fields, to help establish centers for design engineering, simulation, and prototyping. The ninth issue, highlighted in this summary, contains additional proposals deserving heightened attention in the formulation of the industrial policy. There are other proposals that can be referred to in this summary under the heading of the ninth issue that deserves greater attention in the formulation of the industrial policy.

V. Issues of stimulation and alleviation of obstacles that burden industrial establishments and limit their competitiveness.

It is proposed to offer appropriate financial incentives along with other incentives in case of local investment in any industry, which could vary according to the level of manufacturing depth and the degree of technology used. This is associated with the provision of credit on concessional terms by lowering the interest rate granted to industrial investors. The presence of various preferential interest rates is proposed to increase gradually as the local component percentage increases for foreign investors and as the production volume increases for local investors in the priority industrial component. It is also proposed to develop protectionist policies for the local industry by exempting imported components necessary for the industry, as well as exempting the final product from value-added taxes, as one of the policies through which a competitive advantage can be achieved for the local product. It is better to continue supporting exports as long as it helps to provide additional levels of protection to the industry in general.

Supporting the localization of some raw materials is recommended, provided that some industries such as iron, metal, engineering, plastics, textile, etc. are improved and developed while ensuring compliance with standards and microprocessors. Furthermore, it is proposed to exempt the local factory from the industry development fee, provided that the exemption is conditional on the gradual deepening of local manufacturing by producing some production inputs. It is also proposed to support infrastructure investment by granting loans at subsidized interest rates and covering part of the cost of such investment in industrial-free zones, and to expand the targeting of such programs to regions, local governments, and special economic zones.

With regard to energy, part of the microfinance funds should be directed to small enterprises that aim to introduce renewable energy for different sectors, especially in the absence of financing plans or clear policies to finance off-grid microenterprises in Egypt. Offering financial incentives such as tax and customs

exemptions for industrial facilities used for solar energy in electricity generation is proposed. The clustering of multiple small-scale projects in the field of renewable electricity should be encouraged through the design of modular projects to achieve the required scale. In general, the administrative procedures and conditions for granting the land necessary for the establishment of solar power generation facilities should be simplified. It is also important to review the current terms and conditions of Renewable Energy Purchase Agreements to address the concerns raised by investors, including the development of standardized forms for renewable energy project documents developed by the International Renewable Energy Agency, which provides effective guidance for standardizing contractual procedures and documents in accordance with international best practices. Finally, it is proposed to reorganize the New and Renewable Energy Authority and make it a "unified platform" for issuing all permits and authorizations required from the concerned institutions and departments regarding renewable energy investments, facilitating the development and implementation of renewable energy projects.

With regard to environmental protection, it is proposed to establish a legal framework for solid waste management that focuses on institutional responsibilities for waste collection, selection of treatment and recycling sites, and creating a mechanism with the Ministry of Electricity and Renewable Energy under which local authorities recycle organic waste. It is also proposed to strengthen international cooperation with international and regional institutions, leading countries, and companies working in the field of renewable energy technology to support clean industrialization. Among the incentives for investment in the new areas are the formation of specialized industrial clusters, addressing issues such as the lack of facilities or the absence of paved roads, the lack of gas station services and security services, and the need for advisory, administrative, and financial services in support of industrial development.

Finally, we emphasize what has been repeated in several parts of this report regarding the importance of consistent treatment between all industrial establishments of different types of ownership, with regard to taxes, customs, and fees, in order to achieve equal opportunities and fair competition in different industries.

To alleviate the obstacles that burden investors, in addition to the previously addressed requirement to exempt industrial establishments from the real estate tax, there are many other burdens that must be considered to be reduced or eliminated, the most prominent of which are the following:

- Fees imposed on vehicles transporting goods when passing through toll stations between cities ("Karta" as commonly referred to), especially since they are not subject to codified rules and are estimated arbitrarily. It also applies to some entities, while exempting other entities owned by the state.
- The fees collected by the Industrial Development Authority for any service it provides, as this authority operates as an economic body seeking profit, while – as previously proposed – supporting industrial growth requires to function as a service provider that provides its services free of charge or at a low cost.
- The customs duties on machinery, equipment, and production supplies present a significant burden, as machinery, equipment, production lines, and their components necessary for project establishment are subject to unified category of 5% in accordance with the Law on Joint Stock Companies, Companies Limited by Shares and Limited Liability Companies. However, these items are subject to a category of 2% if they are used in projects in accordance with the provisions of Article No. 10 of the Investment Law, as well as the Law on the development of medium, small and micro enterprises. The burden of customs duties is often added to other burdens such as ground usage fees that escalate for reasons beyond the control of the importer, such as prolonged inspection and examination period by the competent authorities.
- Costs that are imposed arbitrarily, such as those resulting from some technically unjustified requests to the Civil Protection Authority, due to the lack of technical knowledge of some inspectors responsible for overseeing the factories. At times, they issue violation reports without inspecting the factory or enforcing decisions without prior notification to the factory owners. Unintentional violations may lead to imprisonment sentences, requiring costly legal disputes to overturn them.
- The cost of getting industrial lands is a significant concern. One of the proposals in this regard is to provide land at a symbolic price or free of charge for some activities and to switch to a usufruct or leasehold system for a period followed by ownership. The government appears to have recently responded to a suggestion which is the allocation of industrial land to the usufruct system. However, if the implementation of the proposal to make land available through the usufruct system solves a problem, it may raise another issue that requires addressing, which is the difficulty in obtaining bank loans that previously relied on land ownership as collateral.
- The high cost of energy, including the expenses of electricity delivery, energy prices, and accounting systems for its use, especially during peak hours.

VI. Bridging information gaps

The state shall contribute to bridging the information gap, in particular by informing producers about the local market and to a greater extent about foreign markets. It is important to familiarize companies with foreign markets by publishing adequate information and preparing lists of the highly demanded goods. This is important, as the local market may have limitations of certain production requirements of the industries targeted for deepening industrialization, and production units may not achieve economies of scale if they are limited to meeting local demand. Therefore, feasibility studies for deepening industrialization projects should be based on accurate information on the foreign markets to which a proportion of production can be exported. It is expected that the recent initiative launched by the Ministry of Public Business Sector will help bridge part of the information gap regarding foreign markets. This initiative aims to revitalize the activities of the Nasr Export and Import Company, now known as 'Gosoor' or ' Gosoor Al Nasr' Company.

It is proposed to establish online platforms to acquaint factories with each other and their respective productions, facilitating access to what each factory might need from others instead of resorting to imports. Foreign factories can also use these sites to order some of what Egyptian factories produce and were not previously aware of, thereby expanding export opportunities, similar to platforms like ‘Ali Baba’ in China and ‘All India’ in India.

It is important to build detailed databases of industrial data and statistics for both existing and new specialized industrial zones. Such databases can help integrate small and medium industries and strengthen value-added chains.

Collaborative efforts between the Ministry of Commerce and Industry with the Union of Industries and Chambers of Commerce are suggested to compile lists of the companies’ requirements for spare parts, raw materials, or equipment, and to inform universities and research centers, provided that these lists are updated periodically. This information can be useful in designing research programs at universities and other research institutions, and it can also serve as a guide for graduate students in selecting their thesis topics, which may lead to innovations that reduce the need of some raw materials, intermediate goods, and equipment, or contribute to the development of some production techniques. Finally, in order to fill the information gap, it is necessary to assess national manufacturing capabilities and determine the potential contribution to the machinery and production equipment industry.

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