



FUTURES IN THE TIME OF COVID-19

RESULTS OF A STRATEGIC FORESIGHT EXERCISE ON THE MANUFACTURING SECTOR IN EGYPT

EXECUTIVE SUMMARY

What are the futures of manufacturing in Egypt in the next five to ten years? Can Egypt use the COVID-19 crisis to create a revolution in manufacturing, can business be unlocked? Or will the gap between the rich and poor, the prepared and unprepared, continue to widen? How should Egypt position itself in terms of not just the implications of the pandemic (near-shoring, localization), but other disruptions such as changes in technology (robotics and automation, the Internet of Everything, 3D printing), Greening and sustainability (the shift to a circular economy, eco-friendly products), and Peer to peer and a sharing economy?

Through a series of Strategic Foresight workshops, these and other questions were discussed by a group of over 60 stakeholders. We did not seek to predict the future, but rather to create scenarios to mitigate risk and create new opportunities for manufacturing. Four future scenarios were developed, along with policy entry points.

1. THE GAP EXPANDS

In this future, the no change scenario, the regulatory landscape and business environment remains unchanged, with current challenges lingering. As a result, we can expect accelerated trends in de-industrialization and loss in competitiveness of Egyptian manufacturing and drop in export earnings. The gap between Egypt and other emerging production sectors globally widens

2. 100 MILLION TO A BILLION

This, the marginal change scenario, was considered the likely future by many participants. In this future, there is a renewed focus on local demand. Egypt manufacturing will produce more for the 100 million strong local market demand, which is likely to be high and would be the focus as the world navigates COVID-19. As well, the export focus will be regional, especially the African market (1 billion population) and Arab nations, but also to some extent Europe (harnessing some of the near-shoring potential emerging as a result of Covid-19).

3. THE GOLDEN KEY

In this adaptive change future, the vulnerable are protected and new industries grown especially

harnessing opportunities offered by industry 4.0. This future is essentially about closing the gap between modernized technology-led manufacturing and traditional labor-intensive manufacturing. The gap is closed by technical and vocational education. There are significant productivity improvements in sectors with application of new technology and skilled workforce and application of circular economy models.

4. ALIBABA TRANSFORMATION

In this radical change scenario, the latent business potential of informal sector, smaller formal sector firms and youth bulge – are unleashed through the linking of two areas: the informal sector (including micro-small formal enterprises) and digital platform technologies. The informal and education sector lead in the transformation of manufacturing.

The preferred future will have elements from various scenarios. The report highlights a vision of manufacturing that mainstreams circular economy, integrates and connects the informal sector and SMEs with rest of the value chain, accelerates adoption of industry 4.0 in selected sectors and taps into emerging market potential domestically, regionally (harnessing AfCFTA) and from near-shoring to Europe.

Taking decisive policy measures to navigate to this preferred future can transform the Covid-19 context into an opportunity for Egypt's manufacturing. Report estimates that it can enable realizing the existing export potential globally of \$14.5 billion (Europe \$ 4 billion, Africa of \$2.7 billion and to Middle-East of \$3.9 billion), while tapping into some of the additional market potential to Europe owing to near-shoring from China. Report finds that China exports currently \$100 billion in goods that Egypt also exports to Europe, so targeting some of this additional export potential might be feasible through near-shoring.

To realize transition to this preferred future, the report identifies key recommendations in four domains, namely, National Industrial strategy; Ease of Doing Business and investment promotion; Industry 4.0 and Innovation Ecosystems; and the Circular Economy and Green Manufacturing.

ACKNOWLEDGMENTS

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INTRODUCTION

With the Covid-19 pandemic disrupting all facets of society, there is heightened uncertainty on the ‘new normal’ in a post-Covid world. Strategic foresight and futures modelling are increasingly used by decision makers in both public and private sector to plan scenarios, guide decision making and prepare for the future. Strategic foresight is a structured and systematic way of using ideas about the future to anticipate and better prepare for change. It is about exploring different plausible futures that could arise, and the opportunities and challenges they could present. Those ideas are then used to make better decisions and act nowⁱ.

The Ministry of Planning and Economic Development and the United Nations system in Egypt, in collaboration with a range of partnersⁱⁱ, organized a multi-stakeholder strategic foresight exercise on the ‘Covid-19 and the future of manufacturing in Egypt’ during June-July 2020.

In two virtual strategic foresight sessions, facilitated by global foresight expert, Prof. Sohail Inayatullah, over 70 sector stakeholders (see annex for participant list) met virtually to develop scenarios for manufacturing in Egypt. They focused on alternative futures to the year 2025. This short-term time horizon was used given the rate of change experienced during the COVID-19 pandemic.

These virtual meetings had two purposes. First to enhance futures literacy in Egypt. This is the ability to read the changing trends and disruptions, manage information and uncertainty through the scenario process, and articulate preferred futures and visions. Second to develop alternative futures or scenarios of the changing nature of Egypt's manufacturing industry. Scenarios are developed to reduce risk, to explore opportunities in different futures, and to develop robust strategies that work irrespective of the future that emerges. Scenarios also lead to higher order conversations among stakeholders. The future thus is collaboratively co-created. Corresponding policy recommendations were identified to trigger change to a preferred future.

An expert reference group meeting was organized to further enrich and validate these scenarios and recommendations. This group consisted of six prominent industry leaders in Egypt, most of them board members of the Federation of the Egyptian Industries (see Annex). The group helped to strengthen the scenario narrative and overall policy recommendations. Further, a work of an analytical group helped to strengthen the scenarios with some quantitative metrics around the scenarios.

Figure 1 : Strategic foresight exercise process



Several types of policy actions can be taken to mitigate the impact of Covid-19 (see figure 2), oriented at keeping business afloat during Covid-19, maintain employment and adapting business. This report focuses on actions to reorient business for the new post Covid-19 economic conditions and realities, while looking at a broader set of emerging issues.

This report presents the key questions tackled by the foresight exercise, the insights developed on future scenarios and the policy recommendations that emerged as an input to the policy decision making process in Egypt.

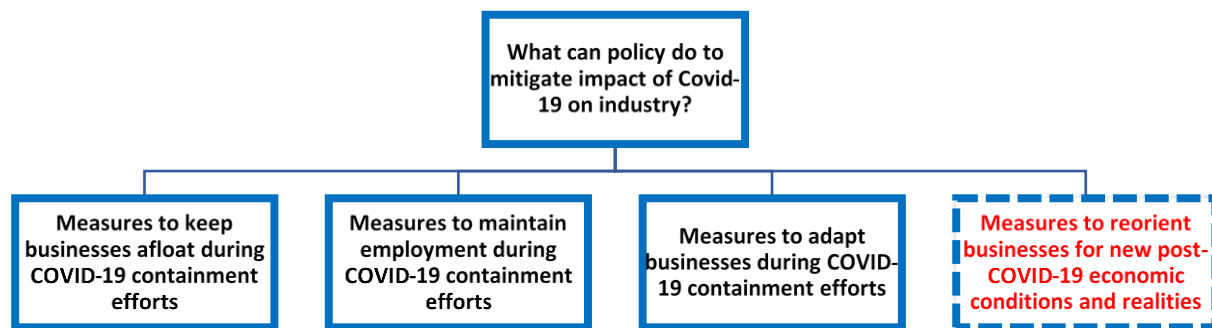


Figure 2 : What can policy do to mitigate impact of Covid-19 on industry ?

Source : UNIDO (2020), <https://iap.unido.org/articles/managing-covid-19-how-industrial-policy-can-mitigate-impact-pandemic>

SESSION 1: Futures Literacy and Horizon Scanning

The first session introduced futures thinking and articulating implications of COVID-19 on the Egyptian manufacturing sectorⁱⁱⁱ. In this process, participants answer a series of questions to assist in the process of futures literacy. These help shift the views of participants from a lack of agency - i.e., nothing can be done as the future is out of control - to there are many positive steps we can do to help create desired futures and reduce the risk of unwanted futures. In this approach, the future is articulated as an asset, an active principle in planning, and not as an empty space. To move participants in seeing the future as active, an initial question was asked on the nature of the impossible.

THE IMPOSSIBLE QUESTION

Question 1: What is impossible today but if possible changes everything for the manufacturing sector in Egypt?

There are numerous responses, among the most insightful in terms of aspects to change in Egypt and constraints:

- Tesla builds a car plant in Egypt.
- Highly skilled and technology literate work force
- Good governance to meet industry needs
- Low cost, high efficiency, personalized production processes
- Wider adoption of circular economy
- Easy access to finance for informal firms
- A full collaboration circle of Academia - Industry – Community
- Integration within regional value chains
- Easy business environment and tax transparency
- The harnessing of youth to be a global center of high value-added manufacturing

THE USED FUTURE

Question 2: What is an example of a used future in Egypt or manufacturing in Egypt?

From here, participants were introduced to the idea of a used future - a practice that the organization and countries continue to engage in even though it does not work. It does not align with the vision, it does not enhance productivity; indeed, it takes away energy, leading to cynicism, and loss of will. Used futures need to be jettisoned so that desired futures can be created. They are the weights of the past that prevent strategic success.

Responses included:

- Staying in traditional products like garments & food
- Manufacturing has to be labour intensive, particularly from low skilled workers
- Working in offices instead of remotely
- Red tape and other regulatory procedures for business registration
- Government as a producer
- One-stop shops

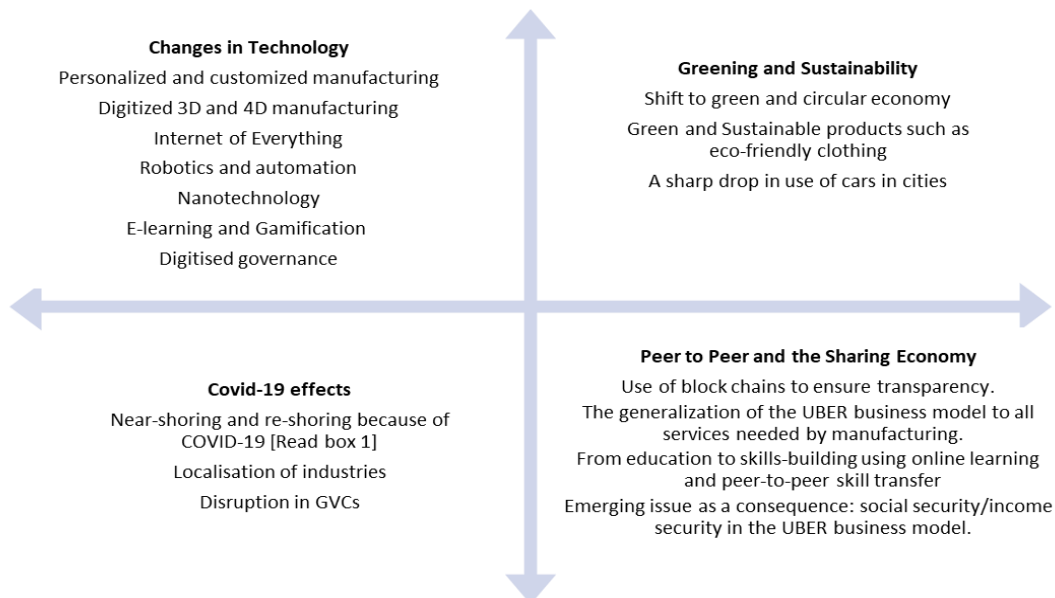
“The notion of one-stop shops has become a used-future in Egypt, we need to aspire for an overall easier doing business environment”

- Reference group interaction

EMERGING ISSUES

From here, we explored emerging issues analysis. These issues are currently still in development - seeds of change - but if they mature to fruition, they are likely to change the rules of business and government. Participants were provided with the background reading material provided by the Futures Platform on emerging trends in manufacturing. As can be noted participants had no shortage of disruptions, they saw possible. These can be divided into changes in technology; changes in the value of nature (sustainability and eco-friendly disruptions; peer to peer disruptions, and other factors (see figure 3)

Figure 3: Mapping of emerging issues



Source: Stakeholder responses during the strategic foresight exercise

Box 1: What is Egypt’s export potential in the context of near-shoring to Europe from China? A preliminary exploration of export potential and key sectors

With Covid-19 impacting and disrupting global value chains, there is an increasing narrative of near - shoring and reconfiguration of global supply chains. The extent of these emerging changes are yet to be seen, however, one important prediction is relocating production from China to closer production bases. In this context for European market, Egypt could prove to be a viable option for re-location and near-shoring from China. The ITC export potential map^{iv} estimates the export potential of countries for 2024. We analysed 1147 products (based on the 6-digit level of the Harmonized System (HS) classification^v), which Egypt exports to the 27 member states of the European Union (EU). All but 37 of these products are also in China’s export basket to the EU. We then focused on products that exceed current export value of over \$100 million each from China, which amounts to 226 products.

Key findings:

For these 226 items the cumulative current export from China exceeds 100 billion annually.

In these categories Egypt currently exports only goods worth \$ 1 billion to European market.

Already currently, even before considering new nearshoring opportunities, the untapped market export potential to Europe from Egypt in these goods categories is an additional \$ 1.7 billion by 2024, i.e., scope to double the current exports.

*Among this, key sectors with highest export potential to Europe are **electronic goods, apparel, pharmaceutical products, machinery, wood products, plastics and rubber, and processed food products.***

With nearshoring, Egypt could aim to target some additional export potential to tap into a share of the \$100 billion worth exports from China in these sectors.

Box 2: What is Egypt’s untapped export potential in the manufacturing sector?

In addition to producing for the 100 million strong local demand, the success of Egypt’s manufacturing will depend on harnessing the untapped export potential. We analysed the untapped export potential of Egypt to different geographic markets based on the ITC export potential map.

The current untapped export potential to global markets in manufacturing goods is around \$14.5 billion.

Some of the sectors with high untapped potential are plastics and rubber (\$ 1.7 bn), apparel (\$ 1.3 bn), Chemicals (\$ 1.3 bn), Food products (\$ 1.2 bn), Fertilizers (\$1.1 bn), Machinery (\$927 mn), Electronic equipment (\$ 630 mn), beauty products (\$ 750 mn), Pharmaceutical products (\$ 292 mn), paper products (\$ 765 mn).

The untapped potential is highest to EU and West Europe, followed by middle-East and Africa, North America and South and East Asia, Latina America, Pacific and Caribbean. The key sectors with export potential are highlighted in the table below.

Region	Untapped export potential in 2024 for manufacturing goods (in billions, in excess to current exports)	Key products with untapped export potential
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EU & West Europe	4.1	Apparel (\$ 800 mn), Plastics and Rubber (\$359 mn), Electronic equipment (\$367 mn), Chemicals (\$362 mn), Machinery (\$237 mn), Food products (\$267 mn), Pharmaceutical components (\$ 126 mn)
Middle East	3.9	Plastics and Rubber (\$423 mn), Food products (\$ 393 mn), Chemicals (\$ 308 mn), Machinery (\$ 232 mn)
Africa	2.7	Plastics and Rubber (\$386 mn), Food products (\$239 mn), Chemicals (\$ 193 mn)
North America	1.2	Fertilizers (\$182 mn), Food products (\$122 mn), Plastics and rubber (117 mn)
South and East Asia	1.2	Chemicals (\$ 254 mn), Plastics and rubber (\$224 mn), Fertilizer (\$ 146 mn)
East Europe & Central Asia	0.61	Plastics and rubber (\$99.6 mn), Food products (\$ 70), Chemicals (\$52 mn)
Latin America	0.35	Fertilizers (\$120 mn), Plastics and rubber (\$40 mn), Electronic equipment (\$ 20 mn),
Pacific	0.04	Food products (\$ 4.7 mn), Fertilizers(\$15 mn)
Caribbean	0.02	Plastics and rubber (\$2.7 mn)

SESSION TWO: FOUR MANUFACTURING SCENARIOS FOR EGYPT 2025

Following this initial session, participants then met again and articulated scenarios for manufacturing and policy recommendations.

To open this discussion, Tarek Tawfik, Deputy Chairman, Federation of Egyptian Industries (FEI)

analyzed the current context and his ideas for a preferred future as shown in Figure 4. His main plea was that the role of foresight work and the resulting policy recommendations was to help unlock the economy, allow it to flourish with wise government enabling measures.

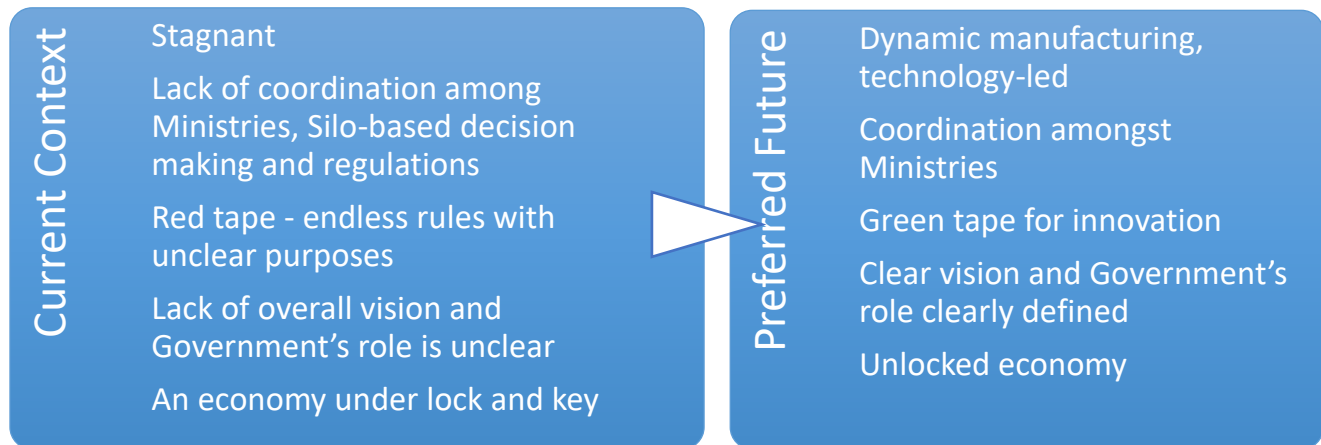


Figure 4: Preferred future

Source: Opening remarks by Mr. Tarek Tawfik, FEI

While there are many scenario building methods available, the "Change progression method" developed by Inayatullah and Milojevic was used as this method integrates both how the external world is changing and what actions are taken. Thus, change moves from no change, to marginal change, adaptive change and radical or transformative change. In this way, policymakers can easily see the possibilities and decisions in front of them. To clarify assumptions, these were passed out to all participants. Four groups were created with moderators for each group.

- **The No-Change scenario.** The next five years manufacturing in Egypt continues along its current path, but the world witnesses rapid change because of COVID-19 and other emerging issues such as digitalization, Industry 4.0, nearshoring, etc highlighted in figure 4.
- **The Marginal Change scenario.** Minor changes are made in a few of the manufacturing sectors,

but the world witnesses rapid change because of COVID-19 and other emerging issues such as digitalization, Industry 4.0, nearshoring, etc highlighted in figure 4.

- **The Adaptive Change scenario.** The sector creatively adapts in a broad array of sectors to the emerging issues such as digitalization, Industry 4.0, nearshoring, etc (highlighted in figure 4) in line with global changes and even faster than comparative nations.
- **The Radical Change scenario.** A major shift or leapfrog is created wherein the rules change. This is a transformational future where we would see fundamental shifts in the landscape and organization of manufacturing, responding at a much faster pace than global changes.

Based on these instructions, four futures were created by stakeholders. The next part of the report summarizes these scenarios and associated policy recommendations.

THE RADICAL CHANGE SCENARIO – The ALIBABA TRANSFORMATION



The Radical change scenario was called the Alibaba Transformation. In this future, the latent business potential of informal sector, smaller formal sector firms and youth bulge – are unleashed through the

linking of two areas: the informal sector (including micro-small formal enterprises) and digital platform technologies. The informal and education sector lead in the transformation of manufacturing. The

informal sector, youth, and digitalization harness vision, creativity and technology to create breakthrough after breakthrough. Current smaller-formal and informal businesses transition into medium size firms that compete on global level, whereby strengthening the ‘missing middle’ of Egypt’s manufacturing. These highly productive

medium sized firms connected to global value chains play an important role in this future. Regulations that are barriers for the informal sector are removed. Harness platform technologies to connect and integrate informal sector to domestic and global demand.

Metrics	Current status	Scale of transformation
Untapped Manufacturing Export potential	Untapped export potential in manufacturing \$14.5 billion ^{vi}	Export potential tapped and new export potential created due to the overhaul of the production systems.
Doing business survey ranking	114	Top 50 by 2025
Manufacturing sector employment	13% of total employment	Significant boost in manufacturing share of employment to over 26%
Source: World Bank Doing Business Rankings 2020, ITC Export Potential data analysis, CAPMAS Statistical Yearbook 2019.		

To create this scenario the following critical shifts are necessary:

- The government puts in place a new legal framework that creates a safe regulatory space in which the informal sector would operate and grow with a high degree of trust in secure transactions and protection of property.
- Set-up a virtual platform that helps connect informal and small enterprise collectives with value chains of larger enterprises and international markets.
- Comprehensive review of ‘doing business environment’ to ensure that informal sector manufacturing firms are encouraged to formalize and enhance their scale of operation to become productive medium sized firms. Start with registering informal sector and documenting promote the transition to formalization building on support efforts during Covid-19 response measures.
- Education curriculum and system is

The shift to informal to formal will not take place by creating ‘incentives’, it is possible only with transition to an overall easier doing business environment.

- Reference group interaction

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- transformed to integrate digital literacy, skills to use emerging technologies and entrepreneurship training targeting the youth.
 - Creating digital friendly regulation that would incentivize the informal and MSME sector to modernize and adapt cutting-edge technologies.
 - Putting in place a regulatory environment that enables financing markets to offer finance product schemes to support the informal and micro-small and medium enterprises sector in digitizing and adopting eCommerce and e-payment.

- Establish targeted incentives and hybrid financing schemes including grants, matching investment schemes, subsidies and procurement policies supporting investments in research and development, technological

upgrading and production capacity expansion in MSMEs, following the best practices in countries such as China, Japan, Malaysia and the United States.^{vii}

THE ADAPTIVE FUTURE SCENARIO - THE GOLDEN KEY



In this future, the vulnerable are protected and new industries grown. This future is essentially about closing the gap between modernized technology-led manufacturing and traditional labor-intensive manufacturing.

The gap is closed by creating a skilled work force through technical and vocational education. Online options given COVID-19 are particularly attractive. There are significant productivity improvements in sectors with application of new technology and skilled work force.

The gap is also closed by becoming industry 4.0 ready and through technology driven productivity

enhancement in all major sectors of manufacturing. This means an investment in not just educational but in internet and backbone soft infrastructure. Enhanced social protection of vulnerable groups.

To prepare for uncertainty in global supply chains, localizing industries and the use of 3D printer technologies would be next steps.

Increased competitiveness and global market share in selected industries, especially with near shoring potential to Europe. Enhanced sustainable and green production certification along different sectors with an overall transition to a circular economy production model.

Metrics	Current status	Scale of transformation by 2025
Untapped Manufacturing Export potential	Untapped export potential	An additional significant near-shoring potential to Europe/MENA/Africa is realized

	\$14.5 billion ^{viii}	Existing export potential to Europe of \$ 4 billion realized, further tapping into export potential to Europe from near-shoring from China also realized (target 5-10 % of \$100 billion market size) Most of \$14.5 billion global export potential realized.
Doing business survey ranking	114	Top 50 -75
Manufacturing sector employment	13% of total employment	Marked increase in share of employment to 20 %
Source: World Bank Doing Business Rankings 2020, ITC Export Potential data analysis, CAPMAS Statistical Yearbook 2019.		

The majority of Egyptian firms are still transitioning or still need the transition from Industry 2.0 to Industry 3.0 while the 4th Industrial Revolution is already underway in many countries. This represents a major challenge for manufacturing upgrading since the new technologies brought by the 4IR is built on existing automation processes and manufacturing capabilities. Indeed, there is little room for leapfrogging from Industry 2.0 to Industry 4.0 directly at the firm level, especially from a technological standpoint since 4IR digitalization relies first and foremost on software applications (IoT, Cloud computing, Big Data, AI) to connect existing hardware machinery and evolve toward the Cyber-Physical model of Factory 4.0.^{ix} Hence an accelerated transition strategy combining industry 3.0 and industry 4.0 is needed in many sectors in Egypt. The recommended policy steps include:

- Develop an Industry 4.0 strategy for Egypt and key sectors, see best practice example from Malaysia in box 3.
- Apply a mission-oriented innovation policy approach targeted at creating new markets, diversifying into new products and improving industrial productivity in selected sectors.
- Revamp technical and vocational education to suit industry 4.0 needs and emerging opportunities.
- Accelerated investments in backbone technology infrastructure.
- Develop a logistics hub like Singapore.
- Incentivize resource efficient and cleaner production practices through a circular economy approach and strategy for the country.
- Targeted import substitution measures in selected industries and adopt measures to localise production.
- Adopt targeted investment promotion policies to attract investments to harness targeted nearshoring opportunities to Europe.
- Enhance social protection schemes and skill training programmes to support workers in transition from one sector to another.
- Implement extension services and vocational training schemes to improve skills related to industry 4.0, following the best practices of Germany and Japan.^x
- Adopt FDI Policy incentives and conditionalities to attract foreign direct investments and favour Industry 4.0 technologies, following the approach in China, Viet Nam, Japan and Germany.^{xi}

Box 3: Malaysia National Policy on Industry 4.0^{xii}

The Malaysian government launched a comprehensive national policy framework 'Industry4WRD: National Policy on Industry 4.0' in 2018, aimed at fostering the adoption of advanced digital production (ADP) technologies in the manufacturing and manufacturing-related services industries. The Ministry of International Trade and Industry, (MITI) the Ministry of Science, Technology and Innovation (MOSTI) and the Ministry of Higher Education (MOHE) lead the creation of this framework. Five main themes were identified as being fundamental for the transition of Malaysia's manufacturing sector in the face of 4IR: i) upskilling and reskilling of the existing and future labour force; ii) inclusion of small- and medium-sized enterprises (SMEs); iii) considerable developments in innovation capabilities and collaborative platforms; iv) focused funding support to kick-start adoption of new technologies; v) adequate digital infrastructure. The policy document identifies some strategic enablers—derived from the five themes identified during the formulation of the strategy—that can leverage the digital transformation of firms. Identified by the abbreviation F.I.R.S.T, these are:

- Providing Funding and outcome-based incentives
- Creating enabling ecosystems and efficient digital Infrastructure
- Ensuring of Regulatory framework and industry adoption
- Up-Skilling existing and ensuring future talent is generated, and
- Providing access to smart Technologies.

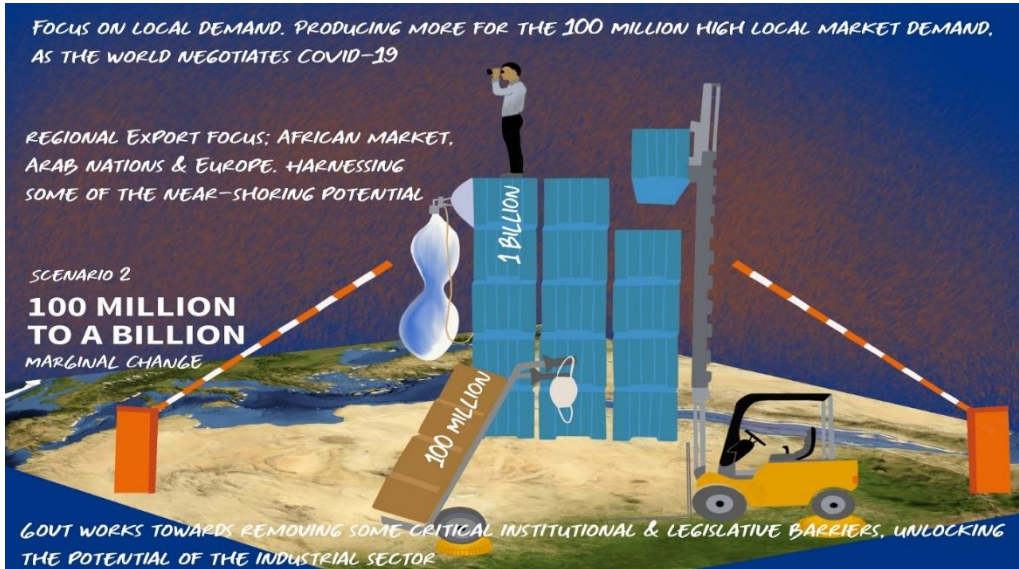
Specific action plans have been developed to achieve sectoral goal. The strategy distinguishes catalytic and

high-growth potential industries (electrical and electronics, machinery and equipment, chemicals, aerospace and medical devices) “as game changers for the manufacturing sector” from other more mature high-growth sectors (automotive, textiles, transport and pharmaceuticals). An action plan fosters the adoption of 11 advanced technologies associated with 4IR to increase productivity and competitiveness in the catalytic and high-growth potential industries.

SMEs, including microenterprises, have been integral to Malaysia's economic transformation process. To support SMEs, the government launched Industry4WRD Readiness Assessment, a programme to help determine SMEs' readiness to adopt ADP technologies, identify gaps and areas for improvement for smart manufacturing, and to raise the technological capabilities of SMEs.

In terms of governance of the strategy, MITI will supervise and chair the multi-stakeholder Malaysia Industry4WRD Council. For a general impact assessment, the strategy also identifies four measurable targets on manufacturing labour productivity, manufacturing sector's total contribution to the economy, World Intellectual Property Organization's Global Innovation Index rankings and number of high-skilled workers in the manufacturing sector. While it is still too early to assess the impact of the national strategy Industry4WRD, Malaysia's commitment, policy-backed, holistic, coordinated multi-partner approach to foster the adoption of new technologies is a noteworthy model.

THE MARGINAL CHANGE SCENARIO – 100 million to a Billion



This was considered the likely future by many participants. This future has three strands. First was a renewed focus on local demand. Egypt manufacturing will produce more for the 100 million strong local market demand, which is likely to be high and would be the focus as the world negotiates COVID-19. Second, the export focus will be regional, especially the African market (1 billion population) and Arab nations but also to some extent Europe (harnessing some of the near-shoring potential emerging as a result of Covid-19). Third, the government works towards removing some of the critical institutional and legislative barriers and partially unlocks the potential of the industrial sector. Thus, localize, regionalize and unlock are the key strategies for this future.

Metrics	Current status	Scale of transformation
Untapped Manufacturing Export potential	Untapped export potential \$14.5 billion. ^{xiii}	Export potential to Africa realized : added \$2.7 billion Some of the untapped export potential to Europe and Middle-East realized : \$ 1 billion out of \$4.1 billion potential [Europe] Export potential to Middle-East partially realized : \$2 billion out of \$3.9 billion
Doing business survey ranking	114	Top 75-100
Manufacturing sector employment	13% of total employment	Maintaining the share of employment or marginal increase 16%
Source: World Bank Doing Business Rankings 2020, ITC Export Potential data analysis, CAPMAS Statistical Yearbook 2019.		

The key policy recommendations are:

- Improving the ease of doing business, capitalizing on the successful practices of free trade zones and investment-zones. Study the possibility to continue/ build on the free zones and streamlining supply to local market during COVID19 as well as accelerated production for African markets.
- Explore the emerging market potential by harnessing of the African Continental Free Trade Area (AfCFTA) and boost investments in sectors with high export potential to African and regional markets.
- Adopt strategic trade policies to support export promotion in new markets, following the approaches of Indonesia, Malaysia and Viet Nam.^{xiv}
- Tap into local market opportunities through modern supply chains mechanisms. For example, by linking local supplies with online retailers and improving access to modern retail formats.
- Support the development of niche products

that are normally associated with vulnerable groups and local communities as well as products in which Egypt enjoy a well-known global reputation such as Egyptian Cotton & Agribusiness.

- Address job security and social protection schemes for workers more comprehensively. We are likely to see more social insurance (new social insurance law) especially for the public sector but this doesn't include the informal/semi-formal sector, who represent the majority of the labor force.
- Encouraging the adoption of sustainability measures; promoting adoption of market access requirements, quality certificates, resource and energy efficiency practices.
- Upgrade technical education and vocational training to match market requirements.
- Explore targeted diversion of natural resources rents and other revenue streams towards productive industrial development capacity, following the model of Indonesia and Malaysia.

^{xv}

THE NO CHANGE SCENARIO - THE GAP EXPANDS



In this future the regulatory landscape and business environment remains unchanged, with current challenges lingering. As a result, we can expect accelerated trends in de-industrialization and loss in competitiveness of Egyptian manufacturing and drop in export earnings. The gap between Egypt and other

emerging production sectors globally widens. The gap between economic groups within Egypt will expand including gender. With manufacturing in decline, it would be important that other sectors compensate, especially service sector.

Metrics	Current status	Scale of transformation
Export potential achieved by 2025	Untapped export potential \$14.5 billion ^{xvi}	The export potential remains untapped and widens.
Doing business survey ranking	114	Drops > 120 as other countries make progress
Manufacturing sector employment	13% of total employment	Fall to below 10% of employment
Source: World Bank Doing Business Rankings 2020, ITC Export Potential data analysis, CAPMAS Statistical Yearbook 2019.		

To mitigate this scenario, participants offered these suggestions as immediate way forward:

- Develop a national Industrial strategy.
- Need to implement a regulatory reform process that addresses all sectoral and cross-sectoral impediments affecting the ease of doing business.
- Need to create systemic platforms that include all stakeholders to create a common vision and strategy for sub-sectors
- Identify potential for localization of manufacturing industry in selected sectors in light of Covid-19 supply disruptions.
- Need a clear plan for power generation/renewable energies/transportation and logistics that supports manufacturing and logistics that supports manufacturing
- Create a vision of technology-led structural change in manufacturing sector to improve productivity.
- Enhance knowledge and technology transfer across countries.
- Review banking sector regulation to promote specialized and long-terms credit for investment in manufacturing sectors, emulating the practices in Brazil, China, Germany and Ethiopia.^{xvii}
- Following the practices in Brazil, Ethiopia, Malaysia and the United States, consider establishing intermediate technology institutes for improving productivity of key sectors.^{xviii}

THE VISION OF A PREFERRED FUTURE OF MANUFACTURING IN EGYPT



These four scenarios give different visions of the future of manufacturing. The future that realizes could be a mix of these scenarios in different sectors, with some sectors making no-change, while some sectors undergoing radical changes. Participants shared four themes around their conceptions of a preferred future. The first was adapting to the fourth industrial revolution. The second was a focus on human centered industrial development, that ensures that the workers wellbeing is take into account along with integration of informal and smaller enterprises into the value chains. The third was the creation of a green economy with environmentally friendly industrial development practices. And the final there were ability to withstand shocks - robust and resilient. Using these broad principles, an aspirational vision of manufacturing in 2025 can be developed combining some of the ideas emerging from the four scenarios.

- A **circular economy model** is realized in Egypt's manufacturing sector limiting the impact on the environment and natural resources. The model integrates to its core the **informal sector and micro-smaller firms**, connecting them amongst each other and to the rest of the economy.
- The potential of **industrial clusters** will be explored that promotes greater interaction between small, medium and larger enterprises across the value chains and promote more circular linkages.
- The focus will be on **productivity enhancement** and graduating a large proportion of smaller firms into medium-sized highly productive firms well integrated into the global value chains.
- Accelerated transition is made to **industry 4.0** in high potential sectors, especially harnessing a skilled young work force for improving productivity and tapping into export potential.

- Some selected products with enhanced production potential for **domestic** and **regional market**, especially harnessing AfCFTA, are identified and promoted to serve these markets. This results in accelerated harnessing of the low hanging fruits in terms of export potential of \$3.9 billion to the Middle-East and \$2.7 billion to Africa.
- An enhanced social protection scheme is developed that provides safety nets of unemployed workers and workers undergoing skill training and retraining to match the industry needs.
- The existing untapped global export potential of \$14.5 billion is fully utilized. New export potential of Egypt to Europe is harnessed in light of emerging **near-shoring opportunities** from global supply chain reconfiguration from China capturing a considerable share of the \$100 billion export market opportunity.
- The economy is unlocked and business environment sees significant improvement with respect to doing business rankings with Egypt climbing to top 50 globally.

Metrics	Current status	Scale of transformation by 2025
Untapped Manufacturing Export potential	Untapped export potential \$14.5 billion ^{xix}	An additional significant near-shoring potential to Europe/MENA/Africa is realized Existing export potential to Europe of \$ 4 billion realized, further tapping into export potential to Europe from near-shoring from China also realized target 10 % of \$100 billion market size) by additional investment in production capacity. \$14.5 billion global export potential realized [priority given to harnessing export potential to Africa (\$2.7 billion), Middle-East (\$3.9 billion)]
Doing business survey ranking	114	Top 50
Manufacturing sector employment	13% of total employment	Significant boost in manufacturing share of employment to over 26%
Source: World Bank Doing Business Rankings 2020, ITC Export Potential data analysis, CAPMAS Statistical Yearbook 2019.		

BACKCASTING: KEY RECOMMENDATIONS TO TRANSITION TO A PREFERRED FUTURE OF MANUFACTURING IN 2025

Keeping in mind the idea of a preferred future of manufacturing, and back casting the vision and the narrative of a new manufacturing in Egypt, some key

level recommendations emerges that can be classified under the following four domains.



Domain 1. New Industrial Strategy

- Urgently develop a cohesive forward looking **national industrial strategy**, which sets the overall vision of industrial development and clarifies the role of Government in the industrial sector. This strategy should integrate the responses towards emerging issues highlighted in this report, including potential of localisation of industries, clearly articulate the role of Egypt in regional value chains and encourage more efficient production practices. It should identify the **'used futures'** in manufacturing and propose an exit strategy from sectors where global demand is decreasing or saturated and draining the resources. It will also serve as an overarching framework for the policy-actions of the Government.
- Adopt a **whole-of-government** governance framework enabling greater collaboration and coordination between key stakeholders and various government entities. Such a framework could allow for active private sector involvement from the beginning as well as structured implementation approach enabling governments to tackle long-term challenges and targets while achieving quick policy wins.^{xx}

Re-licensing acting as a disincentive to production during Covid-19

The textile sector in Egypt witnessed a dual demand and supply shock in light of the covid-19 crisis and its implications.

Businesses wishing to switch to producing protective gears, such as masks, need to get a new license. Requiring an already authorized enterprise to get re-licensed to produce a product that is critically needed is a barrier to production, in terms of time and effort. A regulatory impact assessment unit within government could have helped avoid this situation.

- Establish a **national futures council on manufacturing** attached to the Prime-Minister's office to implement and monitor the national industrial strategy and integrate emerging issues to the strategy from time to time. **Immediately, the council should identify the specific goods and sectors that are near-shoring from production bases such as China**

and match it to existing export activities to the addressed markets and target those directly with a set of incentives. The council should also help identify the ‘used futures’ in manufacturing and propose an exit strategy from sectors where global demand is decreasing or saturated and draining the economic resources.

- Create a **regulatory impact assessment unit** at the highest level of the Government to ensure that any new proposed decrees, laws and regulations are in line with the overall industrial strategy, promote ease of doing business, and coherent with existing legislations.

Domain 2: Ease of Doing Business and Investment Promotion

- Address structural and policy barriers common to all manufacturing sectors and sector specific conditions to enhance manufacturing capabilities.^{xxi}
- Urgently review **customs procedures** and **regulations** to simplify the processes for customs clearance and cross-border trade to help harness the untapped export potential of Egypt to the tune of US\$ 14 billion. In this regard, explore the potential to **privatize parts of customs clearance** process to enhance efficiency.
- **Rationalize and unify investment regimes.** Currently There are around 6-7 investment regimes in Egypt, each promoted by a different entity (GAFI, Suez Canal Authority among others) which different implications, in addition to upper Egypt where land is given without cost. There is no clear rationale for an investor to choose between these different regimes, and there is evidence that the competition between these regimes lead to misinformation and ambiguity and complexity to it, deter foreign investors. A new and unified investment

regime (linked to the new industrial strategy) is needed to streamline the investment process. This will enhance the performance of investment zones and stimulate investments to harness the **near-shoring opportunities** emerging from GVC consolidation in the context of Covid-19.

- Take urgent measures to increase transparency, coherence and predictability of **tax codes and licensing.**
- Rationalize and simplify the **land allocation** process.
- Ensure **harmonization of regional and local level policies** to ensure that the overall policy framework support the overall national industrial strategy.
- Combine horizontal and vertical interventions in order to create an enabling business environment and attract more FDI. This includes three main pillars: Investment support factors, Regulation and policy factors, and Sector-specific factors.
- Attract higher value-added, higher technology-intensity and higher complexity FDIs to orient the production structure toward knowledge-intensive manufacturing. Best practices follow a “high-road” to Global Value Chains combining

We need to ensure that our ports act as ‘entry passages’ to our country and not operate as ‘toll booths’.

- Reference group interaction

both integration and enhancement and build capabilities to adapt to the 4IR paradigm.^{xxii}

- **Enhance the benefits of FDIs for local manufacturing in terms of capabilities through focusing on FDI-SME linkages.** SME-FDI linkages and potential effects materialize in different mechanisms which can be summarized through

three types of linkages. Firstly, general linkages: innovation and human capital spillovers can rise when inward investors bring in a new expertise and technology. Such positive externalities can also happen through labour mobility between foreign and domestic firms. Secondly, supply-customer linkages: local SMEs become suppliers of inward investors which expands market opportunities for SMEs allowing them to integrate in Global Value Chains. This can also lead to increase SMEs competitiveness with the standards introduced by foreign companies. Finally, technology-partners linkages: arising when foreign firms and domestic SMEs partner on common projects as part of joint ventures and strategic alliances allowing direct innovation and technology spillovers.^{xxiii}

- Ease regulations, procedures and customs process to allow Egypt to benefit from R&D outcomes and innovation processes.
- Enhance linkages between industry-academia-research centres and the entire innovation ecosystem to help manufacturing sector to climb up the value chain.
- Estimate the **skill gap** to match the industrial strategy and create accelerated educational investments to match these. The focus should be placed on collaborative assessment of current and future skills needs and gaps in order to adapt educational and training content accordingly. The initiatives should adapt the workforce to occupational and skills needs reconfigurations within the manufacturing sector. They should focus on skill needs induced by the **industry 4.0** while taking into account the current skill gaps which already represent a

Domain 3. Industry 4.0 and innovation ecosystem

- **Map out the current activities, initiatives and regulations on industry 4.0** including on renewable energy, smart cities, power grid and others.
- **Develop an industry 4.0 strategy** and articulate its role in the overall national industrial strategy, following the example of Malaysia (see box 3).
- Address industry-wide challenges to **industry 4.0** adoption, starting with an identification of most critical areas for the **industry 4.0** such as R&D and skills. Building on these technology-specific enablers, the most critical ones across 4IR trends should be identified and prioritized. These include innovation, education and skills policy as well as ICT infrastructure.^{xxiv}
- **Simplify the intellectual property regime** so that firms can easily register new products in Egypt and get rewarded for innovation.

Egypt was able to manufacture ventilators at almost 10% of the cost of imported ventilators. Africa presents a huge market opportunity for these low-cost models. But the regulations and customs procedures are a huge hindrance to tap this potential currently.

- Reference group interaction

major issue for manufacturing firms.

- **Enhancing the supply of knowledge-workers** (especially ICT and digital experts) in manufacturing through new higher-education programs dedicated to the future of manufacturing. At the same time, focus should be made to **re-skilling and up-skilling** the current workforce in occupations witnessing changing tasks and skills. This can be achieved through lifelong-learning schemes in partnership with private sector as well as

anticipating and assisting the professional reconversion of workers threatened by job loss due to automation.^{xxv}

- **Link the SME-support initiatives with the other policy areas relevant to industry 4.0** in order to enable greater efficiency of these initiatives. For example, programs dedicated for young innovative companies, with technology through programs assisting manufacturing SMEs in their digital journey, with skills through training schemes targeted at SME employees, with investment policy through SME-FDI linkages programs etc.^{xxvi}

Domain 4. Circular Economy and Green Manufacturing

- **Create a circular economy vision and strategy for the country**, clearly articulating the role of industry, informal economy and other sectors. This will help to reduce the environmental impact of the production and consumption process and generate new revenue generation opportunities. This would also be critical in integrating the potential of informal sector into the economy.
- Design an **integrated policy framework to adopt circular and green manufacturing practices**

Conclusion

The foresight exercise provided a multi-stakeholder inclusive platform for stakeholders to come together and brainstorm on the future of manufacturing. The purpose of the exercise is not to predict the future, but rather to envision different potential futures and recommend policy actions that can be implemented now to transition to a preferred future. The stakeholders developed four scenarios of future of manufacturing in Egypt and a vision of preferred future combining elements of these four futures. In

across all segments of value chains (eco-design, alternative materials, renewable energy sources, resources efficiency throughout manufacturing operations notably by leveraging new technologies) while also promote new business models deriving from the circular economy (shifting the focus from traditional linear-chain approach to product lifecycles in order to achieve sustainability synergies across supply chains).^{xxvii} Move beyond the simple promotion of renewable energy use and include circular economy promotion (both through regulation and waste management strategies), energy-efficiency programs, green manufacturing and eco-innovation support (through regulation, financing, green investment, sustainable procurement).

- **Link more effectively environmental policies and other policy areas such as education** (focusing on skills needs for green transitions) or SME-support (by providing targeted support for SMEs which face higher constraints in terms of access to information, financing, etc. to face environmental requirements) to support the green transition.^{xxviii}

the process, stakeholders had open conversations on the critical challenges confronted by the manufacturing sector in Egypt and formulated potential entry points of solutions that can be classified under the four domains of a new national industrial strategy; ease of Doing Business and investment promotion; industry 4.0 readiness and innovation ecosystem; and circular economy and green manufacturing. These recommendations need follow up action plans by relevant stakeholders.

Annex 1: Participant list

	Name	Institution
1	Sherif El Diwany	Alexandria Business Association
2	Olivier Stoullig	African Development Bank
3	Sara Bertin	African Development Bank
4	Heba Korashi	American University in Cairo
5	Samer Atallah	American University in Cairo
6	Soha Abdelaty	AUC
7	Mona Amer	Cairo University
8	Waleed Azab	Chemical and Fertilizers Export Council
9	Ahmed Huzayyin	Chemonics Egypt
10	Bassem Kamar	EBRD
11	Shaimaa Hedaya	Egyptian Commercial Service
12	Dr Magued GEORGES	Egyptian Export Council for Medical Industries
13	Mohamed Samy	Engineering Export Council of Egypt
14	Maha Saleh	Engineering Export Council of Egypt
15	Dr. Walid Gamaleldin	Export Council for Building Materials
16	Irene Selwaness	Faculty of Economics and Political Science, Cairo University
17	Laura De Matteis	FAO
18	Khaled Abdelazim Khalifa	Federation of Egyptian Industries
19	Ahmed Fikry Abdel Wahab	Federation of Egyptian Industries
20	Shaimaa Bahaa El Din Hussein	Federation of Egyptian industries
21	Tarek Tawfik	Federation of industries.
22	Emad Ghaly	German Chamber
23	Stefan Bergheim	German Futures Centre
24	Karin Elshafei	German-Arab Chamber of Industry and Commerce
25	Jan Noether	German-Arab Chamber of Industry and Commerce
26	Mohamed Hossary	Giza Systems
27	May El-Dardiry	Giza Systems Education Foundation
28	Saleh Dina	IFAD
29	Mohamed El-Ghazaly	IFAD
30	Breisinger, Clemens	IFPRI-Egypt
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34	Yasmin Farid El-Emady	Industrial Modernization Center (IMC)
35	Elizabeth Kalishian	Industrial Modernization Center(IMC)
36	Hisham Basha	Industrial Modernization Centre (IMC)
37	Muhammad Azhar Rauf	International Finance Corporation / World Bank Group
38	Matthias Knappe	International Trade Centre
39	Yasmine Helal	International Trade centre
40	Lilia Naas	ITC
41	Mohamed Hassouna	Ministry of Public Business Sector
42	Dalia Tadros	Ministry of Public Business Sector
43	Shereen Allam	Ministry of Social Development
44	Sara Noaman	Ministry of Trade and Industry

45	Ahmed Osama Reda	Ministry of Trade and Industry
46	Nermine Abulata	Ministry of Trade and Industry
47	Reham Rizk	MoPED
48	Farah Sadek	MoPED
49	Cherine Khallafa	MTI
50	Mohamed Abbas	Nile University - NilePreneurs
51	Ahmed Farouk	Nilepreneurs initiative at Nile University
52	Jorge Galvez Mendez	OECD
53	Joshua Polchar	OECD
54	Alaa	The Engineering Export Council of Egypt
55	Amal abd el kader	The National Council for Women in Egypt
56	Randa Aboul-Hosn	UNDP
57	Sylvain Merlen	UNDP
58	Mohamed Bayoumi	UNDP
59	Riel Miller	UNESCO
60	Kwamou Eva FEUKEU	UNESCO
61	Jana El Baba	UNESCO
62	Ahmed Salah	UNESCO
63	Paul Hector	UNESCO
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69	Annachiara Scandone	UNIDO
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72	Sally George	UNRCO
73	Amira Shoukry	USAID SEED

END NOTES

ⁱ OECD definition, <https://www.oecd.org/strategic-foresight/>

ⁱⁱ See annex for the full list of partners

ⁱⁱⁱ The core ideas are based on Sohail Inayatullah (2020) *What Work: Case studies in the Practice of Foresight*.

^{iv} <https://exportpotential.intracen.org/>

^v The Harmonized System is an international nomenclature for the classification of products. It allows participating countries to classify traded goods on a common basis for customs purposes. At the international level, the Harmonized System (HS) for classifying goods is a six-digit code system. See :

<https://unstats.un.org/unsd/tradekb/Knowledgebase/50018/Harmonized-Commodity-Description-and-Coding-Systems-HS>

^{vi} Calculated using ITC export potential map dataset

^{vii} Read more about it in United Nations Industrial Development Organization, 2020. Industrialization as the driver of sustained prosperity. Vienna

^{viii} Calculated using ITC export potential map dataset

^{ix} UNIDO, Programme for Country Partnership (PCP), Egypt, Diagnostics Study, 2020.

^x Read more United Nations Industrial Development Organization, 2020. Industrialization as the driver of sustained prosperity. Vienna

^{xi} Ibid.

^{xii} United Nations Industrial Development Organization, 2019. Absorbing Advanced Digital Production Technologies to Foster Industrialization Evidence from Case Studies in Developing Countries. Background document prepared for the Industrial Development Report 2020. Vienna: United Nations Industrial Development Organization. Vienna.

^{xiii} Calculated using ITC export potential map dataset

^{xiv} Read more United Nations Industrial Development Organization, 2020. Industrialization as the driver of sustained prosperity. Vienna

^{xv} Ibid.

^{xvi} Calculated using ITC export potential map dataset

^{xvii} Read more United Nations Industrial Development Organization, 2020. Industrialization as the driver of sustained prosperity. Vienna

^{xviii} Ibid.

^{xix} Calculated using ITC export potential map dataset

^{xx} UNIDO, Programme for Country Partnership (PCP), Egypt, Diagnostics Study, 2020.

^{xxi} Ibid.

^{xxii} Ibid.

^{xxiii} Ibid.

^{xxiv} Ibid.

^{xxv} Ibid.

^{xxvi} Ibid.

^{xxvii} Ibid.

^{xxviii} Ibid.

