

ج  
ظ  
ن  
م  
و

## CHAPTER FOUR:

THE ENABLING  
ENVIRONMENTS  
AND THEIR  
EFFECTIVENESS  
IN THE TRANSFER  
AND LOCALISATION  
OF KNOWLEDGE

ع  
و  
ي

ي



## Introduction

---

In the previous chapter, we presented the situation of the Arab youth with respect to their cognitive, cultural, economic and social effectiveness. The current chapter offers an analysis of the status of the Arab enabling environments, in order to study their successes and failures. The chapter also examines the ability of these enabling environments to transform the Arab youth from a population growth that burdens the development process into a human capital. Such a capital will form an effective production force and will help in achieving a wealth of knowledge that nurtures development and enables the region to move towards the knowledge economies and the establishment of the knowledge society.

This chapter then addresses three main axes: the first addresses the enabling environments which prepare the youth directly, namely universities and higher education institutions. The second includes an analysis of the status of research and development (R&D) as well as other innovation environments. The third axis deals with the broader enabling environments, namely economic and political ones that include developmental and legislative policies, in addition to effectiveness and governance.

## Higher Education in the Arab Region

---

Higher education plays a major role in development. Higher education institutions are the main actors in the transfer, diffusion and production of knowledge processes, through training and research activities. It also assumes a unique social responsibility in developing values, citizenship, engagement in the labour and production market and participation in civil society activities. These institutions produce the human capital required for comprehensive development and the labour market, which is regarded as a crucial and essential factor for economic and social progress in any society.<sup>1</sup>

When institutions of higher education succeed in achieving high quality and meet

the needs of a society, the opportunities for youth integration into the labour market, life and society as a whole increase with respect to the transfer and localisation of knowledge. They also help achieve integration between economic institutions and the forces that organise labour as well as the institutions that are active in civil society. These institutions become an essential mechanism in inducing community change to achieve the objectives necessary for establishing the knowledge society. Higher education institutions are also considered among the most important that can draw together various parties, including students, researchers and instructors, with various backgrounds to work together towards achieving future aspirations for the entire nation.

In its interaction with globalisation, the knowledge and technology revolution has increased the importance and effectiveness of universities in achieving their objectives in terms of knowledge diffusion, production and localisation. With the favourable opportunities it offers, globalisation has also raised many problems for universities, in both its influence and its impact. This in return has reflected on the university environment and administration, governance, teaching methods and appraisal, education, training, research and innovation programmes, as well as on its relationship with production and industrial establishments, and the civil society. Universities all over the world, including those in the Arab region, have opened their doors to the growing social demand for university education in order to keep up with the increasing requirements in the labour markets for workers with high levels of knowledge and skills. Higher education has moved from educating the elite to educating the masses.

The question raised is: How has higher education institutions in the Arab region reacted to international, regional and national changes, with respect to programmes, educational structure and the organisational and institutional environment, so as to be an active factor in the integration of the youth in the transfer and localisation process, and to contribute to building knowledge society?

---

Higher education institutions are the main actors in the transfer, diffusion and production of knowledge processes, through training and research activities

---

In its interaction with globalisation, the knowledge and technology revolution has increased the importance and effectiveness of universities in achieving their objectives in terms of knowledge diffusion, production and localisation

## The Emergence of Universities and the Spread of Higher Education in the Arab Region

The region witnessed the emergence of the first Arab Islamic universities with the beginning of the 8th Hijri Century, during which many universities were established in the Mashriq and Maghreb as religious high schools under the Islamic civilisation. These included the University of Al-Qarawiyyin in Morocco, University of Ez-Zitouna in Tunis, Al-Azhar University in Cairo. However, Arab universities in their modern European form did not emerge until the beginning of the 19th Century, during the “Muhammad Ali” era and within the framework of his modernising project in Egypt with all its victories and defeats. Those universities served as high schools of various disciplines such as engineering, medicine, agriculture, languages and the arts, with the aim of communicating and transferring knowledge, technology and European management systems for the establishment of modern Egypt.

At the end of the 19th Century and the beginning of the 20th, the region, with most of its countries still under occupation, witnessed popular and governmental movements as well as foreign missions that established universities in the Arab region. Three universities were founded in Egypt: The Egyptian University in 1908 (currently Cairo University), King Farouk I of Egypt University (currently Alexandria University) in 1938, and Ain Shams University in 1950. The American University in Cairo was founded in 1919 as a private non-profit university. In Syria, the Syrian University (currently University of Damascus) was established in 1923, and in Algeria the University of Algiers was founded in 1959. The University of Khartoum in Sudan was founded in 1936. Lebanon witnessed an early establishment of private universities, where the American University of Beirut was founded in 1866 and Saint Joseph University in 1875. The Lebanese University was established as the first public university in Lebanon in 1951.<sup>2</sup>

A study conducted by the Association of Arab Universities showed that until 1953

there were around 14 universities, both public and private. Historically, most of the foreign private universities were located in Lebanon.<sup>3</sup> With the beginning of the second half of the 20th Century, several renaissance factors emerged, following the independence movements. These included the progressive movement in Tunisia through which the country was united as a nation state, the development movement lead by Gamal Abdel Nasser and the modernisation movements in the Arab Gulf countries. Meanwhile, governments in the region witnessed a shift that placed education as a mechanism for development and the support of independence. Given these national historic drives, popular aspirations and social demands for higher education and the needs of development increased.

Under the influence of all these events, the efforts of Arab governments in building universities and higher education institutions expanded and multiplied. Consequently, the number of universities in the Arab region increased from 233 universities in 2003 to around 286 in 2006, of which 153 are public universities and 133 are private. The number of students reached 4.4 million, and members of faculty 183,000. The percentage of human and social specialisations was 78% while scientific specialisations stood at 22%. These numbers increased in 2012, where the number of universities reached 500, and the number of students grew to around 9 million, with 220,000 faculty members. As for the student-faculty ratio, it improved to almost 31 to 1; while it remains as low as 100 to 1 in some universities and certain specialisations. In the Gulf countries, these ratios vary between 17 to 1 and 41 to 1, with the global average set at 15 to 1.<sup>4</sup> Table 4.1 shows the number of universities and students in the Arab countries, according to the same study.<sup>5</sup>

## Higher Education Characteristics in the Arab Region

Higher education institutions in Arab states can be classified into three basic models, according to their historical

---

In 2012, the number of universities in the region reached 500, and the number of students grew to around 9 million, with 220,000 faculty members

Table 4.1

## Higher Education Statistics in the Arab Region (2011)

Countries	2011				
	Number of Universities			Number of Students	Number of Faculty Members
	Public	Private	Total		
Tunisia	13	19	32	360 000	21 210
Iraq	25	8	33	397784	31 990
Bahrain	2	8	10	35 848	3 100
Yemen	8	13	21	300 000	10 000
UAE	2	19	21	59 333	1 861
Morocco	14	4	18	419 885	12 085
Sudan	28	7	35	500 000	9 700
Lebanon	1	19	20	205 000	12 700
Oman	1	7	8	80 000	4 100
Kuwait	1	4	5	34 560	1 705
Saudi Arabia	23	8	31	667 000	21 320
Syria	5	10	15	282 484	9 500
Egypt	20	15	35	2 800 000	67 000
State of Palestine	2	13	15	196 625	5 900
Jordan	11	18	29	336 000	8 898
Libya	9	2	11	264 000	9 000
Somalia	3	11	14	4 147	195
Mauritania	1	-	1	25 000	1 175
Djibouti	1	-	1	15 000	580
Qatar	1	6	7	15 500	1 100
Algeria	34	2	36	1 149 899	19 500
<b>Total</b>	<b>206</b>	<b>193</b>	<b>399</b>	<b>8 148 065</b>	<b>252 619</b>

Source: Abu-Orabi 2013.

emergence and nature. The first model is the historical, traditional, central, public and free model; it is widespread in most Arab states except for Lebanon and the State of Palestine. The second model exists in Lebanon and the State of Palestine and is characterised by decentralisation and private education. The two models have acquired these characteristics by virtue of the establishment of both countries and the surrounding historical circumstances. At later stages, this model spread to other Arab countries.<sup>6</sup>

Under the influence of global trends, most Arab states adopted the policy of economic liberalisation following the neo-liberal model in light of the globalisation phenomenon. They also expanded the privatisation of higher education to allow for a wider spread of free pre-university education. In the context of this policy, higher education in

these countries started to be regarded as an important means to assist development policies in integrating local work forces into the global economy. These policies tangibly contributed to the spread of higher education in the last decades and expansion in private education.

As part of their reform efforts, and within the framework of global interaction, countries adopting the first model witnessed progress leading some of them to adopt policy aspects based on “neo-liberalism” within the trend of globalisation. As such, private institutions of higher education were established, and in some countries that were adopting the public higher education model, the Arab Mashriq in particular, the ratio of private institutes and universities reached 48.5%.<sup>7</sup> During the past 25 years, the number of private universities in the Arab region increased to more than 200 in

Under the influence of global trends, most Arab states adopted the policy of economic liberalisation

2011, representing 40% of the total number of universities in the Arab region.<sup>8</sup>

What is noteworthy is that most of the private universities in Lebanon, as well as the American University in Cairo, were non-profit institutions. In fact, the first for-profit private university was founded in Jordan in 1990, and then many other countries followed, such as Yemen, Sudan and the Arab Gulf states.<sup>9</sup> It should also be noted that private universities in the West are generally non-profit institutions, although “profitability” started in certain western universities, it rather remains very restricted and does not represent a trend, as is currently the case in the Arab region.

As for the third model, which is the private foreign model, it appeared in the context of progressing efforts towards adopting neo-liberalism and the knowledge economy within the framework of globalisation. Branches of mostly western foreign universities were widely introduced in many countries in the Arab region. This policy did not only result in the increase of the private sector share in higher education, but also in more diversity, as well as new programmes such as distance learning, open education and parallel education programmes that reached out to more students. This policy also drove the expansion of education in Jordan, the Gulf countries and Egypt, while Arab Maghreb states showed reservation in adopting this policy and recorded relatively low rates in higher education enrolment compared to other countries in the region.

Meanwhile, one study shows how the Gulf countries have created, to some extent, a new model of higher education that enables the building of the knowledge society. The model relies on opening branches of foreign universities, mainly western, in compounds with innovative names such as Doha Education City, Dubai Knowledge Village, and University City of Sharjah. For instance, Doha Education City was built on an area 14 km<sup>2</sup> and is the largest international compound for universities in the world. It includes branches of

internationally renowned universities such as Georgetown, Carnegie Mellon, and Cornell. In Abu Dhabi, Massachusetts Institute of Technology was founded as part of Masdar City, a huge university city. However, these private universities are characterised by expensive fees and the majority of students are foreigners or children of expatriates from other Arab countries.<sup>10</sup>

#### Box 4.1

#### The Internationalisation of Universities and Higher Education in the Arab Region

The existence of foreign universities, or their subsidiaries, or higher education institutes outside their country of origin, has become an apparent phenomenon due to the influence of the knowledge and technology revolution, as well as the hegemony of globalisation that goes beyond country borders.

Studies and international reports show that the Middle East has hosted 34% of the total foreign university branches in 2009. In this same year, there were 160 foreign university campuses – outside their countries of origin – in the Arab world. Most of them were inaugurated during the past fifteen years, especially after the year 2000, and the majority of them are affiliated with American universities. The origins of the foreign universities in the Arab region vary from Australia, to the United Kingdom, Canada, France, Russia, as well as India and Singapore. The UAE hosts almost one quarter of the region’s international university branches, followed by the State of Qatar, with around nine branches. Kuwait, Bahrain, Jordan, and Tunisia also have branches of international universities, as well as local-international universities such as the German University in Cairo and Paris IX in Tunis. Accordingly, the pattern of internationalisation of education varies on the Arab region territory. Saudi Arabia, for instance, has adopted a different model, where high-level international universities were involved in the design and establishment of the King Abdullah University of Science and Technology, with respect to the development of the programmes, building global partnerships in the fields of research, helping students and faculty members to communicate with international researchers, obtaining knowledge facilities and exchanging visits and expertise with the finest universities and research centres in the world.

Source: World Bank 2012b.

Thus, higher education has witnessed diversity with regard to the types of universities, specialisations and student

Higher education has witnessed diversity with regard to the types of universities, specialisations and student distribution over the public and private institutions

distribution over the public and private institutions. The UNESCO data (2010) indicate that the percentage of public universities and higher institutes amounts to 63.8% compared to 36.2% private, and that the percentage of public universities is almost equal to that of private universities (51.5 compared to 48.5).<sup>11</sup> As for the distribution of students, the public sector still prevails in the region (See Figure 4.1).

There is no doubt that efforts in expanding higher education in the Arab region are a necessity imposed by the requirements of the knowledge-based society in need of highly-skilled labour forces. However, these efforts will remain futile unless backed up by similar efforts to advance the quality of education services and outputs. The following question then arises: to what extent can one say that these policies of expanding higher education in the region are effective in enhancing the development processes and arming the youth with opportunities and capabilities

enabling them to participate and contribute in building a knowledge society?<sup>12</sup>

### Problems of Higher Education in the Arab Region

Apart from the lower rates of youth enrolment in higher education institutes, in comparison to developed countries, higher education in many Arab countries is also affected by the following:

First: There is still a genuine concern surrounding the adequacy and effectiveness of these systems in equipping the youth with the opportunities and capabilities that enable them to participate in economic development. Arab universities, especially the reputed public universities accommodating most of the Arab students, have inadequate teaching methods, extreme shortage of research policies, in addition to obsolete academic decisions. Furthermore, they are not coping with the requirements of the knowledge society. Therefore, these countries are witnessing the brain drain phenomenon among their gifted citizens, and have inadequate technical training and scientific formation needed for the progress towards the aspired knowledge economies.<sup>13</sup>

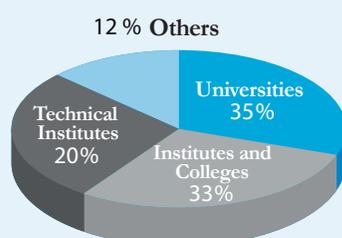
Second: the extended presence of western universities, particularly in the Gulf countries, can help in introducing new methods, decisions and specialisations that cope with the requirements of the knowledge society. However, this might create certain social and political controversies, including, for instance:

- Progress in research might occur in natural sciences, mathematics and technology, but the culture surrounding these universities will remain unchanged. These universities also face the risk of non-integration of knowledge, or as it is referred to in the history of society development, the non-integration of the scientific culture and the human one.
- International universities located in the region remain expensive. At the same time, Gulf countries endorse policies

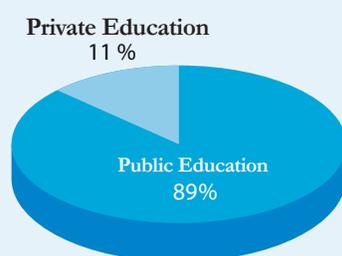
Arab universities, especially the reputed public universities accommodating most of the Arab students, have inadequate teaching methods, extreme shortage of research policies, in addition to obsolete academic decisions

Figure 4.1

#### Classification of Higher Education Institutions in the Arab States



#### Distribution of Students between the Private and Public Education in the Arab Countries



Source: UNESCO 2010a.

of free education at all stages for their citizens and fulfil their social needs. This puts the largest burden in educating citizens on public universities. As for international universities, their students are likely to be the children of expatriates or foreign workers, whose numbers may reach up to 75% of the population, and who have the wealth and capacity to enrol their children in these universities.<sup>14</sup> This could also create a gap in the acquired skills of citizens graduating from traditional universities and expatriates graduating from international universities. It could also impede policies aimed at raising employment rates among young citizens and localising jobs; policies that governments in the Gulf countries are striving for achieving. Meanwhile, the knowledge localisation process transferred through these universities will also be impeded.

This last point illustrates the higher education situation in Arab countries in a clear and obvious duality; national, traditional local universities versus foreign, advanced international universities. The latter will remain isolated in a cultural space in the country they were established, unless major economic progress occurs in these countries and the controversies are absorbed so that the whole community benefits. If this does not occur, the problem could worsen and jeopardise the future of foreign institutions. These controversies are the result of the growing impact of globalisation reflected in the Arab states in what is called the commodification of knowledge, as opposed to its localisation.

### **Higher Education and Unemployment of University Graduates in the Arab Region**

As we have already witnessed with knowledge effectiveness, the unemployment rates among those with higher education, whether in the Gulf States or the Arab region in general has reached an alarming level. A serious attempt should be made to examine the extent and capabilities of the Arab countries in preparing a human capital that

meets the requirements of youth integration in the process of transfer and localisation of knowledge and for moving towards the knowledge economies. The question raised is: What are the reasons behind high unemployment among educated people? In other words, how much does the labour environment (the labour market) contribute to the aggravation of the phenomenon of youth unemployment in general, and that of higher education graduates in particular?

According to various reports and indicators on unemployment, the issue is complex and multidimensional. Geographical, social, political, economic and educational factors combine to make the employment structure in the Arab countries non-conducive to the knowledge society. The employment structure strongly contributes to the marginalisation and exclusion of the youth and women, who are victims of the absence of development policies. Therefore, one cannot understand these reasons, their impacts and interactions without analysing the general features of this structure.

### ***The General Features of the Labour Market and Unemployment in the Arab Region***

Statistics show that the highest rate of participation in the work force exists in countries that import technical labour, where male participation is estimated at almost three times that of women. The agricultural sector includes the largest proportion of labour in poorer countries where employment in this sector reaches more than 50%, while this rate drops to 20% in economies with rich resources. The social and personal services sector constitutes more than 40% of the labour force in developed countries that import labour; workers leave the agriculture sector and seek better wages in the services sector.<sup>15</sup> It is also noticed that labour exceeds 50% in the social and personal services sector in countries that are affected by conflict. The agriculture sector accounted for 27.8% of jobs in the region in 2008. This sector remains predominant in the employment of women, as 39.3% take up jobs in agriculture, while it accounts for 27.8% of men's

---

Geographical, social, political, economic and educational factors combine to make the employment structure in the Arab countries non-conducive to the knowledge society

employment.<sup>16</sup> The employment of women is centred on services and community activities in developed countries that import labour, as well as in countries subject to conflict, while the participation of women in the agriculture sector in less developed countries is significant.

The public sector still plays a major role in the recruitment process, as the International Labour Organisation report in 2009 indicates that around 29% of the total number of people employed in the Arab world are in the public sector.<sup>17</sup> This might lead to a distortion of the labour market due to the fact that this sector focuses on diplomas instead of skills when recruiting workers, in addition to the inadequacy of the skills acquired by learning with the actual needs of the labour market.<sup>18</sup> The danger of this phenomenon lies in the possibility of directing the human capital away from the jobs that enhance economic growth.<sup>19</sup> This means that the labour market structure in this sense is far from the process of youth integration in the localisation and employment of knowledge, due to the scarcity of job opportunities in the sectors related to knowledge, knowledge production and research. This was reflected in the quantities and types of specialisations chosen by the Arab youth in universities, and the low rates of those enrolled in science, engineering and medicine faculties, as well as other specialties required for the transfer and localisation of knowledge.

### ***Job Opportunities in the Arab Region***

The labour market in most countries of the region is characterised by rigid regulations that are not in harmony with labour and employment. These regulations have become obstacles impacting the flexibility of the economic activity in the labour market.<sup>20</sup> One study shows that the employment to population ratio in the region is below 45%.<sup>21</sup> There are different estimates regarding the number of job opportunities needed to be created in the Arab Region. One estimate suggests that 80 million job opportunities are needed in the region to reach a 64% employment ratio in 2020. If the ratio is to reach 70%, then the

region will need 100 million job opportunities for the same period, which requires a steady growth at the rate of at least 4.4 yearly.<sup>22</sup>

Other investigations suggest even higher figures. According to one study, and in order for non-GCC countries to be able to reach full employment and increase women's participation in the labour force to 35% (which is 15% less than the average in developed countries), by 2030, they will have to create 92 million jobs. This requires an investment estimated at USD 4.4 trillion (in fixed prices for the year 2005). This means that the average annual investment value amounts to USD 220 billion (i.e. approximately 50% of the GDP of these countries in 2009). As for the least developed countries, the investment rate required is much higher; it reaches 100% of the GDP approximately, which definitely requires large foreign support to be achieved. Others estimate that for the creation of 29 million jobs, an investment of USD 1.4 trillion is needed, and this amount rises to USD 2.1 trillion for the creation of 41 million jobs.<sup>23</sup> Whatever the case, all of these estimates clearly indicate the magnitude of the unemployment problem and the need to address it effectively to ward off mounting costs on the present and future generations.

Another characteristic is represented by the weakness of the private sector contribution. Despite the efforts the Arab region countries have made in economic liberalisation policies in order to push the private sector to play a larger role in the economy between 2002 and 2008, the impact of these efforts on economic and social development processes was limited. Research touched on the fact that these efforts did not lead to a tangible increase in invigorating and supporting the private sector to fulfil its role in integrating the youth into the process of knowledge production and transfer, encouraging entrepreneurship among the youth, as well as improving job opportunities and the quality of life. The administrative and political environment of civil society, as well as the private charity entities remained heavily exhausted and unaffected by change.<sup>24</sup> As indicated earlier,

---

The labour market in most countries of the region is characterised by rigid regulations that are not in harmony with labour and employment

this imbalance in the economic structure has resulted in an increase in the unemployment rates among highly qualified youth and weak entrepreneurship.

### ***Obstacles That Have Led to the Youth Unemployment Crisis***

#### *The Weak Quality of Higher Education in the Arab Countries*

Many Arab countries have strived, especially in the beginning of the 21st Century, to establish quality assurance organisations. They have established the Arab Network for Quality Assurance in Higher Education (ANQAHE) with the support of the World Bank. Still, these government-affiliated organisations, which lack independence most of the time, seem to have limited capabilities, and have not directed their efforts in a serious manner towards the modification of higher education institutions, or in their vision of basic reform.<sup>25</sup> Studies show that current governance and the application of practical methods and mechanisms that are far from the new requirements for achieving change and transformation hinder efforts to achieve the requirements of excellence and more towards greater competitiveness. Arguably, higher education institutions in many Arab countries are a continuation of the higher authorities of the state, with an evident absence of public policies and legislations that enable and facilitate independence and transparency, in addition to the accountability of these institutions.<sup>26</sup>

#### *A Gap between Higher Education Outputs and the Requirements of the Labour Market*

The decrease in productivity, increase in unemployment rates among the educated and weak competitiveness of the Arab labour force compared to foreign labour are in large part due to the gap between the educational formation and the requirements of the labour market, as well as the weakness of educational programmes and vocational and technical training. Developed countries are aware of the connections between higher education institutions and local,

regional and international labour markets, and have worked towards achieving them as a matter of importance for continuing economic development. Nevertheless, we find that these connections remain extremely frail and weak in the Arab region and do not effectively serve the major objectives of Arab societies. This explains the demand and the continuous call for higher education institutions to achieve harmony between their education and research outputs and their research functions, and the development of their communities in terms of linking knowledge and research with the labour markets and the human economic development.<sup>27</sup> The education as well as technical and vocational training have not benefited from vertical and horizontal reforms and effective governance that would enable them to overcome the gap between their quantitative and qualitative outputs and the reality of professions and skills in the labour market.

#### *Poor Skills and Their Relation to the Weak Connection between Universities and the Public and Private Sectors*

The dissatisfaction of employers with the skills of university graduates, which we already addressed in the previous chapter within the framework of knowledge effectiveness, is considered among the main obstacles to recruitment. Higher education institutions do not bear the responsibility of this issue alone; they share it with the weakness of the participation of the public and private sectors.

Acquiring skills, developing creativity and innovation, and investing in research cannot be achieved without the link between higher education and the private sector, and without establishing partnerships with the public and private sectors, and developing mechanisms that help achieve the third function of university and other higher education institutions,<sup>28</sup> that is in addition to creating economic environments that encourage the youth to acquire knowledge and high-level skills that are relevant to the knowledge economy and society.

Developed countries are aware of the connections between higher education institutions and local, regional and international labour markets, and have worked towards achieving them as a matter of importance for continuing economic development

### *The Weakness of the Vocational and Technical Formation and Training Systems in Higher Education Institutions*

If the mismatch between the skills and the requirements of the labour market is one of the factors contributing to the spread of unemployment among higher education graduates, then this is due, in addition to the aforementioned reasons, to the absence of vocational formation and training systems in higher education institutions. It is true that there is diversity in the Arab countries in formal education and vocational training, but they follow mostly pre-university education ministries, or various authorities whether “agricultural”, “industrial”, “construction” or “service”. The second AKR has delved deep into detailing their types and features.<sup>29</sup> Nevertheless, certain Arab countries have begun various initiatives that aim to develop technical education and vocational training systems in the public sector, or with the contributions and collaboration with the private sector. These include; Applied Education and Training in Kuwait, Technical Education and Vocational Training in Yemen, Technical and Vocational Education and Training in Bahrain and Tunisia, the Vocational Preparation and Training of Trainers Centre, founded by the Vocational Training Corporation in Jordan, and the dual education known as Mubarak Kohl Initiative in Egypt.<sup>30</sup>

For the purpose of integration through technical education and preparing specialists and researchers who would combine knowledge and applied skills, new specialisations in technical baccalaureate and technical higher education were introduced in collaboration with employers with their financial and human resources. This took place during in the last decade of the past century, in specific fields such as welding, glass, prosthodontics, medical labs and tissue culture. The experiments which started with clear visions succeeded, while those that could not overcome the academic style staggered. However, technical and vocational education and training in most Arab countries has been criticised for the lack of national strategies and policies and

the weak contribution of the private sector in partnering with education and training public institutions. One of the major drawbacks of vocational and technical training is the stereotyping of the training specialisations and curricula, the limitation of training programmes and the weakness of their connection with higher education and university education.<sup>31</sup>

### **Higher Education and Brain Drain in the Arab Region**

The growth of giant transnational corporations, within the framework of globalisation, has led to the internationalisation of higher education and scientific research employment, be it for researchers, students and institutions. This has been especially witnessed in sectors of electronics, metallurgy and medications and has resulted in the emigration of great numbers of scientific cadres from the Arab region to countries abroad.<sup>32</sup> The absence of education and research environments coupled with low wages has supported the brain drain in the Arab region as people search for distinguished jobs at international corporations and research centres. This has become one of the main issues in Arab countries.

A World Bank study (2012) shows that there are millions of Arab immigrants, both youth and adults, in OECD countries. Most of them are from Morocco (1.5 million), Algeria (1.3 million), Tunisia (400,000), Lebanon, Iraq, and Egypt (300,000 from each country). The biggest portion of these immigrants are graduates of higher education (35%). The Arab immigrants amount to 42% of the total immigrants in France, and around 15% of the total immigrants in Sweden, Spain, Germany, and Belgium, and 2.6% of immigrants in the United States of America.<sup>33</sup> A UNDP report regarded the brain drain phenomenon as a reverse aid from less developed countries to developed ones. It presents a severe crisis in the development of the Arab region,<sup>34</sup> for it makes the region lose an important source of education, knowledge and technology, as well as intellectual elements and historical

---

The absence of education and research environments coupled with low wages has supported the brain drain in the Arab region as people search for distinguished jobs at international corporations and research centres

experiences.<sup>35</sup> It also indicates the inability of the region to retain its human resources with varying degrees among countries.

This is evident in Table 4.2, which shows the performance of a number of Arab countries on the indicator “Country capacity to retain talent”, or the ability of the state to provide job opportunities to university graduates and keep national competences and talents. Qatar came first in the international ranking, followed by UAE (rank 6), while a great number of countries failed to keep their national capabilities and talents such as Yemen (rank 139), Algeria (rank 137), Mauritania (136) and Egypt (rank 133).

**Table 4.2**  
**Capacity of A Country to Retain Talent (2013-2014)**

Country	Value of the Indicator (7-1)	Global Ranking (of 148 Countries)
Algeria	2.1	137
Yemen	2.1	139
Egypt	2.3	133
Libya	3.1	87
Lebanon	2.7	115
Mauritania	2.1	136
Morocco	3.6	54
Jordan	3.7	53
Kuwait	3.5	66
Bahrain	4.6	22
Oman	4.8	16
Saudi Arabia	4.6	18
UAE	5.5	6
Qatar	6	1

*Source: World Economic Forum 2013*  
*\*Note: 1 = Skilled people leave for better opportunities in other countries*  
*7 = The country offers the required opportunities for those with capabilities*

The internationalisation of labour markets, skills, knowledge workers and research centres, as well as the production of knowledge in the framework of globalisation, necessarily require a reconsideration of the phenomenon of emigration of the highly skilled from developing to developed countries. It also requires a change in thinking about this phenomenon from a study of the reasons behind the movement to focusing on the movement itself, and how to benefit from it. Studies show that

the emigration of scientists takes place when living conditions are difficult, whether for professional, political or economic reasons, or when advanced professional opportunities present themselves along with better living conditions for further scientific growth.<sup>36</sup>

Emigration does have its positive aspects; it opens doors to new experiences before the youth, helping the formation of cognitive and social capitals and the achievement of financial returns that constitute between 5% and 20% of the GDP in some labour-exporting countries. Financial returns sent to the country of origin have helped to provide job opportunities for women or opportunities of self-employment in areas that do not require high skills, such that the returns constituted capitals that are exploited in achieving public economic activities that provide flexible employment (the cases of Egypt and Morocco).<sup>37</sup> However, this does not overshadow its negative aspects that are represented in the brain drain phenomenon and the decrease of production at the national level. Many emigrants also face problems related to the type of policies that are enforced upon them abroad. This entails greater responsibilities on states and governments to prepare adequate conditions and offer incentives to encourage the immigrants of intellectuals, scientists, researchers and creative people to return in order to localise what they own in terms of knowledge capital and to contribute to the renaissance of their countries and increase development.

One can be guided in this area by the experiences of several developing countries that have aspired to build progress focused on knowledge and interest in research (East Asian Countries).<sup>38</sup> These countries have succeeded in benefiting from the emigration of their scientists, researchers and highly skilled citizens, and have turned loss into profit. They have gathered the scientific skills of emigrants in institutional networks that facilitate the distribution of cadres and information, and initiates research and scientific programmes in common with the research communities and institutions,

Emigration does have its positive aspects; it opens doors to new experiences before the youth, helping the formation of cognitive and social capitals and the achievement of financial returns that constitute between 5% and 20% of the GDP in some labour-exporting countries

locally and abroad. In addition, these countries were able to benefit from their emigrated citizens in ways that have gone beyond financial returns.<sup>39</sup> For instance, India built organised and strong ties with its emigrant citizens abroad, and extended these ties locally into networks and partnership programmes. It also encouraged its scientist citizens abroad to return to invest in the national economy and to bring along their savings and high-level scientific expertise, which benefited the nation's institutions economically and politically. The same applies to China, which encouraged its citizens to return by providing them and their children with education and housing, and opened research centres and highly skilled jobs. Studies show that there are one million highly skilled Indian scientists abroad that only represent 3.43% of the number of scientists in the country. There are also more than 600,000 highly skilled Chinese scientist emigrants, representing less than 3% of scientists in the country. On the other hand, we find more than half of Lebanon's scientists abroad.<sup>40</sup>

### R&D System in the Arab Region

The technological research and development system aims at inducing accumulated knowledge that leads to the production of knowledge in the form of scientific discoveries, new technology applications or inventions. The research system encompasses Research & Development (R&D), Science and Technology (S&T), Innovation & Renovation, Education and Training, infrastructure, and Information and Communication Technologies (ICTs). This research system also includes three activities: basic scientific research, applied scientific research and technological development. It operates with its diverse activities in all areas of natural and engineering sciences, as well as social and human sciences.<sup>41</sup> Research in its integral system is entrusted with the generation of knowledge, theories, and ideas, as well as the formation of knowledge capital and building knowledge cadres. Technological development is considered an objective and a means, as it is considered the medium between research and production

sectors. It is at the same time a product that represents the progress of research for creating tools, designs, innovative methods and new products.

In this part of the fourth chapter of the report, we analyse the status of research systems and monitor the extent of scientific progress, development and innovation in the Arab region. This aims at studying the strengths and weaknesses of these systems, which might help define the Arab needs imposed by the necessity of pursuing the development of this system, enhancing its skills and role in the transfer and localisation of knowledge, and anchor a new development model based on knowledge, innovation and novelty.

### Scientific Research Institutions

Most researchers agree that the status of scientific research in the Arab region is still one of the major obstacles standing in the way of knowledge, hindering the efforts towards real achievements in building the knowledge society.<sup>42</sup> The efforts in building an effective research system face several obstacles, most importantly the absence of a culture that supports research and creativity, the weakness of research institutions governance, the absence of comprehensive policies for building integrated systems of R&D and the weakness of funding and human resources.

The first problem is an outcome of the region's historical and cultural legacy. Studies show that there is concern over the adequacy of cultural dimensions in making social, economic and political changes for building an advanced system of research in the Arab region achieving the mission of localisation of knowledge in terms of transfer, employment and production (see Chapter 3 "Cultural Effectiveness"). In fact, countries that succeeded in advancing towards modernity and renaissance and building a knowledge society (such as Japan, Singapore, and Malaysia) are the ones that succeeded in reshaping cultural structures in their communities, and were able to introduce major cultural adaptations. This has resulted

---

Most researchers agree that the status of scientific research in the Arab region is still one of the major obstacles standing in the way of knowledge, hindering the efforts towards real achievements in building the knowledge society

in spreading the culture of education, scientific thinking, critical thinking, research, experiments and values of relativity, change, openness to the future and to the world, and individual and academic freedom, which enabled them to achieve their astounding renaissance in knowledge economies.<sup>43</sup> This is not available in the Arab countries, where implicit knowledge<sup>44</sup> derived from the Arab patriarchal cultural heritage is still more influential than explicit knowledge systems that universities and schools are trying to spread.

#### Box 4.2

##### Arab Science and Technology Foundation (ASTF) in the UAE: Achievements in Knowledge Transfer, Employment and Production

The Arab Science and Technology Foundation <http://www.astf.net>, is a non-governmental non-profit civil institution working to support scientific research and technological innovation, to contribute to the efforts of building the knowledge society and economy in the UAE. The institution's headquarters is in Sharjah City. It was founded in April 2000, on the recommendation of 375 Arab scientists in Arab countries and abroad.

The institution has focused on knowledge transfer, employment and production in the UAE, and the ASTF established more than 30 companies and supported 750 researchers working in 142 research projects. The institution is also concerned with the programme of Technology Transfer Offices TTO, as well as programmes to extract innovation and creativity, <http://adenobserver.com/read-news/4315>

The institution is also concerned with turning scientific research and technological innovation into start-ups. We recall here the case of the company Vestec, <http://www.vestec.com>, which currently provides its technological products for the employment of artificial intelligence technology.

There are other companies that were founded by the ASTF, including the company Accuvis Bio <http://www.accuvisbio.com>, which is considered "the promotion arm of the institution's scientific research products", in collaboration with the Abu Dhabi University and the Khalifa Fund for Enterprise Development, which is the first and largest biotechnology incubator of its kind in the UAE and the Arab region and is based on the campus of the Abu Dhabi University. The incubator aims at marketing the investment in Emirati patents among regional and international companies that work on corresponding products.

*Source: Arab Science and Technology Foundation (ASTF) 2013. (Reference in Arabic)*

The second problem arising from the historical inheritance of long colonial eras is the governance of scientific research. After independence, from the mid-20th Century, the region's countries took it upon themselves to establish universities and spread education as one of the mechanisms to support the independence and unity of the nations. The central authority of each country played a key role in this, acquiring great strength as the main supporter of the expansion of education and scientific research. Accordingly, the historical origination of scientific research activities in the Arab countries was characterised by two main features: the first was its inception in the confines of universities established by the government, with the exception of research centres scattered outside universities to face some of the problems in agriculture and health, as happened in Egypt, Lebanon and some countries of the Maghreb. The second feature was represented in the government origination that directed its efforts from the beginning with the omission of many important political and scientific issues.<sup>45</sup>

This strong presence of Arab governments in the management of the scientific research sector in most countries in the region resulted in general in the existence of a permanent central authority in the form of a ministry or a central governmental institution. Therefore, the stronger the government and its political will towards scientific research, the more research activities advanced and prospered. Studies show that most of the Arab countries still rely on the Ministries of Higher Education and Scientific Research to directly supervise the centres of scientific research and development programmes.<sup>46</sup> It should be noted that this general characteristic is present to varying degrees in different Arab countries. In Egypt and the Maghreb countries, governmental bodies for scientific research have been established and they employ permanent researchers to study the important sectors in the state. The government is responsible for these bodies so these researchers work in agriculture and health in general, and are distributed over multiple ministries and agencies. Only a small number of research centres

Only a small number of research centres specialise in the development of essential strategies for scientific research

specialise in the development of essential strategies for scientific research. Europe and France specifically have succeeded in the creation of this type of centre that ensures future planning for scientific research and monitoring of the public interest, with the application of the findings in agriculture, health, marine science, defence, space, energy and other vital public sectors.<sup>47</sup>

Such institutions exist in a very limited manner in the Arab Mashriq, especially in Syria, Lebanon and Jordan. They employ experts who are different from academics working in university research centres, and whose research findings are closer to implementation than to innovation and novelty. However, in Tunisia and Morocco, and in Algeria to some extent, governments have played a major role in establishing strong research institutions. The budget for scientific research relatively increased in these countries. It is expected that this will lead to the liberation of scientific research, development and innovation from bureaucratic control, which may yield effective and sustainable development.

Some countries in the region witnessed the establishment of science villages or cities, or the import of foreign universities and research centres. The attitudes of people involved in research regarding these establishments varied, as was the case with the establishment of foreign university branches in the Arab countries. In the GCC countries peculiarities reside in matters of “sustainability” and knowledge localisation. Some are in favour of this direction, considering this experience essential for achieving links between knowledge production sites in the world and the Gulf countries within the context of the internationalisation of skills and knowledge, in the midst of globalisation and the internationalisation of scientific research standards and functions. On the other side, reservations point to the weakness or absence of national cadres in these villages and centres that are capable of transferring knowledge. In addition, foreign researchers might return to their home countries at any time, which could threaten sustainability due

to the drain of acquired implicit knowledge that leads to real localisation of knowledge.

#### Box 4.3

##### From the Global Research Report by Thomson Reuters

The report indicates the long-term success of initiatives such as the King Abdullah University of Science and Technology (KAUST),<sup>47</sup> the Education City in Qatar and Masdar in Abu Dhabi will rest on their capacity to develop a pool of high quality, locally trained graduates and faculty members. Sustained investment in all levels of the education system is required to ensure success of these high standard establishments. Primary and secondary schools must be equipped with quality staff able to inspire students to pursue further academic study, and equip them with required capabilities. Graduates need a vibrant research and entrepreneurial community in which to pursue rewarding careers if they are not to be tempted overseas. These make it necessary to search for talent and capacities in all parts of the Arab region in order to include them in such projects. If economic integration is a necessity among the countries of the Arab region, the integration of scientific research activities and the integration of the Arab youth - from wherever in the region - in the transfer and localisation of knowledge processes are no less important and they are necessary to achieve economic integration. Without this, these efforts - at least in sparsely populated countries - will continue to be isolated projects at best, thus making us fear their continuity.

Source: Thomson Reuters 2011.

#### Box 4.4

##### Smart and Academic Villages in the Arab World

###### Maadi Technology Village and the Smart Village, Egypt

Egypt has long adopted ICT as part of its national development agenda, with an ICT Master Plan already established in 2009. The Information Technology Industry Development Agency (ITIIDA) and the Ministry of Communications and Information Technology were instrumental in establishing the Maadi Technology Village in southern Cairo and the Smart Village in Cairo's western suburbs. The Maadi call centre is expected to serve as a major outsourcing destination and also create 40,000 jobs. The Smart Village, established in 2003, already has more than 120 companies and 28,000 professionals

###### Dubai International Academic City (DIAC), the UAE

This major project was launched in May 2006 and will be a centre for schools, colleges and universities. By 2015, the Dubai International Academic City is expected to host more than 40,000 students.

Source: International Telecommunication Union 2012a. (Reference in Arabic)

Some countries in the region witnessed the establishment of science villages or cities, or the import of foreign universities and research centres.

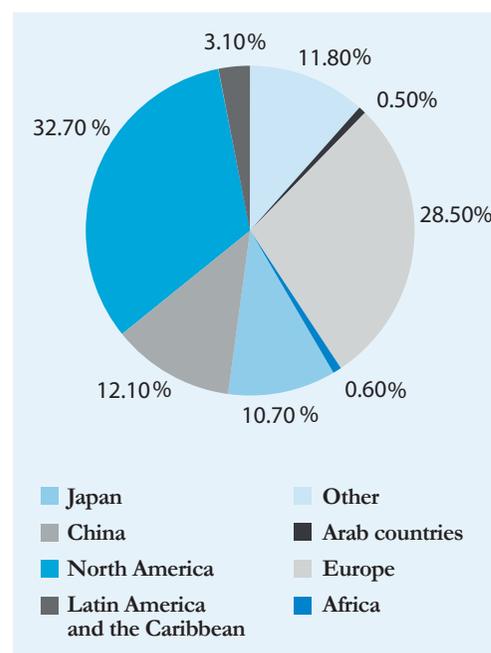
## Spending on Research and Development Activities

Statistics show that the rates of spending on R&D in the Arab countries as a percentage of GDP during the past four decades do not meet the requirements of this sector. In recent years, the Arab countries only allocated modest amounts of their GDP to research and development, at a rate ranging between 0.03 and 0.73%.<sup>49</sup> Table 4.3 shows that the Arab states' allocations for R&D, as a percentage of the GDP, are far below the global average reaching about 2.13%. The gap is evident if we compare the Arab region to countries of the European Union, whose percentage of R&D expenditure reaches 1.98%, or Japan, whose percentage is about 3.39% of the GDP. Figure 4.2 shows that the combined share of the Arab countries from the global spending on scientific research did not exceed 0.5% of the total global expenditure in 2009, even though they count more than 5% of the world population, which is not at all commensurate with the development aspirations of the Arab citizens and their

In recent years, the Arab countries only allocated modest amounts of their GDP to research and development, at a rate ranging between 0.03 and 0.73%

Figure 4.2

Combined Share of Arab Countries from Global Expenditure on Research and Development Compared to Selected Countries and Regions of the World (2009)



Source: Akoum and Renda 2013.

Table 4.3

Research and Development Expenditure as a Percentage of GDP (2010-2011)

Country/Country Grouping	R&D Expenditure as a Percentage of GDP
South Korea (2011)	4.04
Finland (2012)	3.55
Japan (2011)	3.39
Germany (2012)	2.92
Global Average (2012)**	2.13
Singapore (2012)	2.1
European Union (28 countries) (2012)*	1.98
China (2012)	1.98
England (2012)	1.72
Turkey (2012)*	0.92
Morocco (2010)	0.73
Greece (2012)	0.69
UAE (2011)	0.49
Mozambique (2010)	0.46
Egypt (2011)	0.43
Sri Lanka (2010)	0.16
Oman (2011)	0.13
Kuwait (2011)	0.09
Iraq (2011)	0.03

Sources: UNESCO 2014a \* OECD 2014 \*\* World Bank 2014a.

human and material abilities, capacities and potentials.<sup>50</sup> This spending on R&D in the Arab countries is not enough to generate wealth and address the needs related to securing food, water and energy to improve services and infrastructure.

The expenditure of scientific research institutions in the private sector remains very low. Among the 131 countries included in the UNESCO study, Tunisia ranked 36th and Qatar and the UAE both ranked 42nd, while Jordan ranked 96th, Egypt 99th, Syria 108th and Bahrain 119th. There is no doubt that the low participation of the private production and service sectors in funding scientific research and technological development clarifies to some extent the limited innovative activity in the Arab countries.<sup>51</sup>

## Human Resources in Research and Development

UNESCO data indicate that the number of full-time researchers per million citizens in 2011 was 864 in Morocco, 524 in Egypt, 132

in Kuwait, 426 in Iraq and 160 in Oman.<sup>52</sup> The number of part-time researchers who work on scientific research per million citizens was 290 in Sudan, 61 in Libya and 42 in Saudi Arabia. The average number of full-time researchers per million citizens in the Arab countries was 373, while the global average was 1,081. There are more than 500 researchers per million citizens in developing countries (Table 4.4). From the data, perhaps with the exception of Jordan and Tunisia, it can be concluded that the number of full-time employees in research and development in the Arab countries was low compared to the number of full-time scientists and researchers in the same year in countries such as Argentina, where the number was 1,236 researchers per million citizens, with 2,800 in Spain and 7,423 in Finland.<sup>53</sup> Statistics on the share of Arab states of world researchers, compared to various countries, reveal an evident lower level. Figure 4.3 offers a comparison between the share of Arab states from researchers compared to countries or regions with similar knowledge and economic features (such as Latin America and the Caribbean) whose share reaches 4% of world researchers, with 0.2% to 0.5% for the Arab region compared to nearly double for Africa with 0.9%.

The working conditions of the current research institutions in the Arab countries do not help scientists in achieving advanced

scientific levels of knowledge in the fields of cognitive production and technical innovations. Therefore, the UNESCO Science Report in the world for the year 2010 indicates that a very limited number of researchers in the Arab world were recognised by the international scientific institutions.

#### Box 4.5

##### Scarcity of Scientists in the Arab Region

Only one of the world's top 100 highly cited scientists comes from the Arab world: Professor Boudjema Samraoui, a biologist at the University of Annaba in Algeria. The annual L'Oréal-UNESCO Awards for Women in Science grants five women US\$100,000 each, one from each continent. The 13 recipients of this award for the Africa and Arab States region between 1998 and 2010, include only five Arab women: Egyptian immunologist Rashika El Ridi (2010) and Egyptian physicist Karimat El-Sayed (2004), Tunisian physicists Zohra Ben Lakhdar (2005) and Habiba Bouhamed Chaabouni (2007) and Lihadh Al-Gazali from the United Arab Emirates (2008). Egyptian-born Ahmed Zewail is the only Arab Nobel laureate in a scientific discipline; he received the distinction for chemistry in 1999 while working at the California Institute of Technology in the USA.

Source: UNESCO 2010b.

##### Scientific Production and Dissemination

In terms of the Arab countries' production of published research papers, studies indicate that it is modest compared to other

There is no doubt that the low participation of the private production and service sectors in funding scientific research and technological development clarifies to some extent the limited innovative activity in the Arab countries

The working conditions of the current research institutions in the Arab countries do not help scientists in achieving advanced scientific levels of knowledge in the fields of cognitive production and technical innovations

Table 4.4

#### Research and Development Expenditure

Region	Researchers (in Thousands)		Share of Total of Researchers in the World (%)		Researchers per Million Citizens		Total Local Expenditure on Research and Development* per Researcher	
	2002	2007	2002	2007	2002	2007	2002	2007
World	5,810.7	7,209.7	100	100	926.1	1,080.8	136	158.9
Developed Countries	4,047.5	4,478.3	69.7	62.1	3,363.5	3,655.8	161.3	195
Developing Countries	1,734.4	2,696.7	29.8	37.4	397.8	580.3	78.5	100
Less Developed Countries	28.7	34.7	0.5	0.5	40.5	43.4	37.6	43.8
Arab Countries Combined	105.2	122.8	1.8	1.7	354.9	373.2	34.3	38.4

Note: The gross local spending on research and development\* per researcher (by thousands of USD, using PPP)  
Source: UNESCO 2010b.

countries in the world. According to the results of the UNESCO Scientific Research Report 2010 monitoring the activities of scientific publication in the world between 2000 and 2008, the number of scientific publications in the Arab countries increased from 7,446 in 2000 to 13,574 in 2008.<sup>54</sup> The average production of research per million citizens in Arab countries was only 41, compared to a world average of 147. In this regard, Kuwait ranked first, followed by Tunisia. This is also evident by the total absence of Arab universities from the results of the “Search Interfaces” report,<sup>55</sup> which reviewed the most prominent research works in 100 sciences and social sciences fields around the world in 2013.

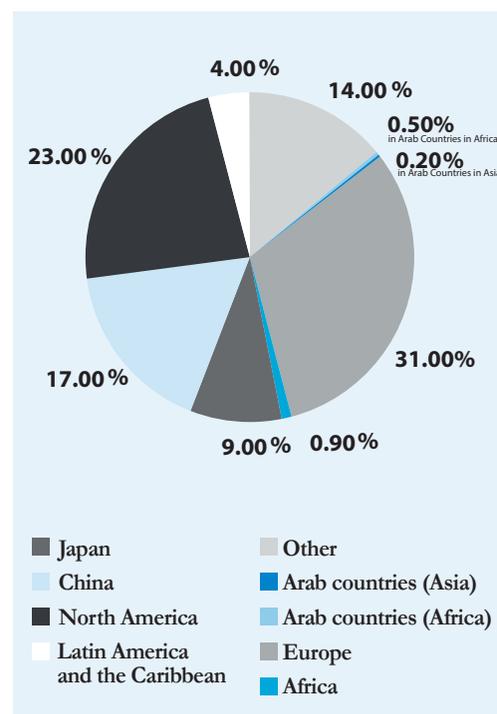
Although all the Arab countries, except Mauritania, witnessed during the period 2002-2008 a significant increase in the number of scientific journal articles,<sup>56</sup> they still lag behind the developing countries and even behind the less developed ones. The situation has not changed much over the last five years, and statistics show that the scientific

production of the Arab countries is still low and published research only constitutes 0.8% of the global average.<sup>57</sup>

The Global Research Report for 2011 confirmed the low level of Arab scientific production through the analysis of research outputs in 14 Arab and Middle Eastern countries: Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, the UAE and Yemen. According to this report, these countries constitute a regional grouping that is similar in terms of the grouping concept to the European Union (E4) countries, the African Group and the Asian Group. Figure 4.4 reveals the extent of the disparity in scientific research progress between the Group of Arab countries and other similar and neighbouring countries, such as Turkey and Iran.<sup>58</sup>

In terms of the Arab countries’ production of published research papers, studies indicate that it is modest compared to other countries in the world

**Figure 4.3**  
Arab Countries’ Share of Researchers Compared to Selected Regions and Countries of the World (2009)



Source: Akoum & Renda 2013.

#### Box 4.6

#### Initiatives to Digitise Iraqi Publications and Documents

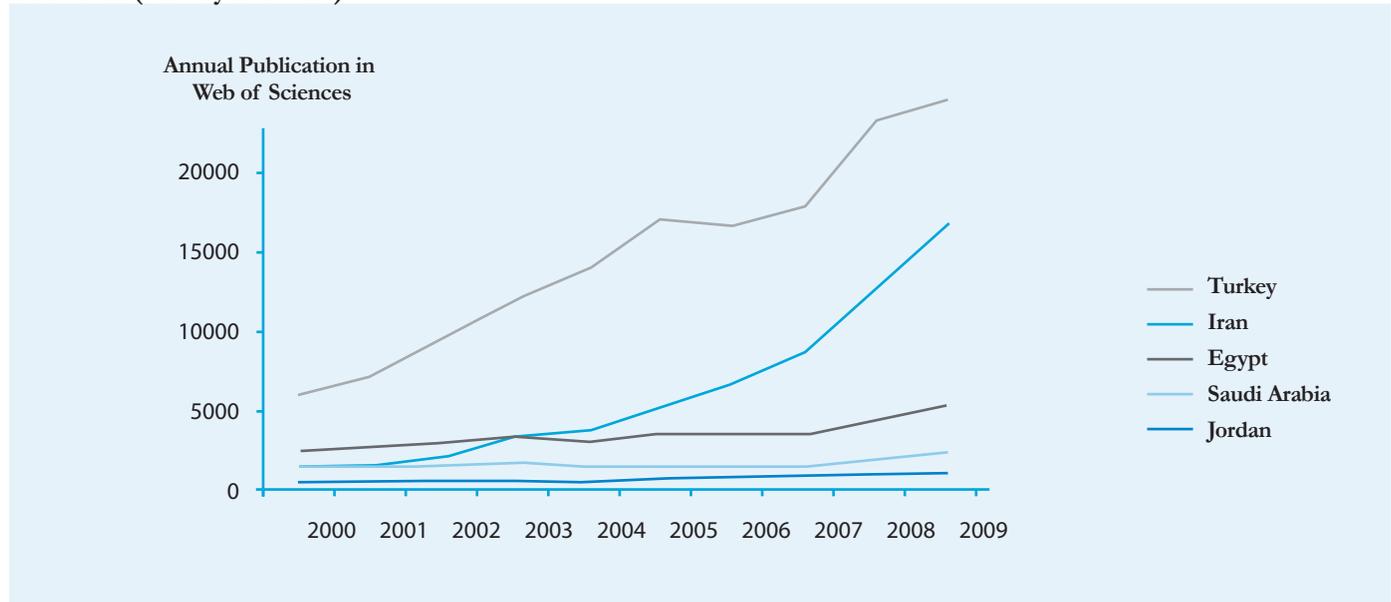
Iraq has a rich tradition of journalistic and scientific publications, which are considered invaluable tools for research in human sciences in the Arab region, particularly in history, literature and politics. Though these journals have been part of a long established and creative scholarly tradition, they are not easily accessible nor available digitally on a large scale. However, in 2006, the American Yale University, in collaboration with the State Library of Pennsylvania and the Royal Library of Alexandria in Egypt, launched a project aimed at digitising the Iraqi publications. The project seeks to digitise a selection of up to 600 Iraqi scientific journals in order to facilitate access to their rare content in the Arab region.

Source: Yale Library 2006

Turkey is one of the largest producers of scientific research among countries of the aforementioned study. Between 2000 and 2009, its productivity rose from 5,000 research publications to nearly 22,000. Its share of the global output of scientific research also increased from 0.7 to 1.9%. The same applies to Iran, where it began from 1,300 research publications in 2000 and increased to 15,000 in 2009. Its share of the global output of scientific research increased from 0.2 to 1.3% during the same

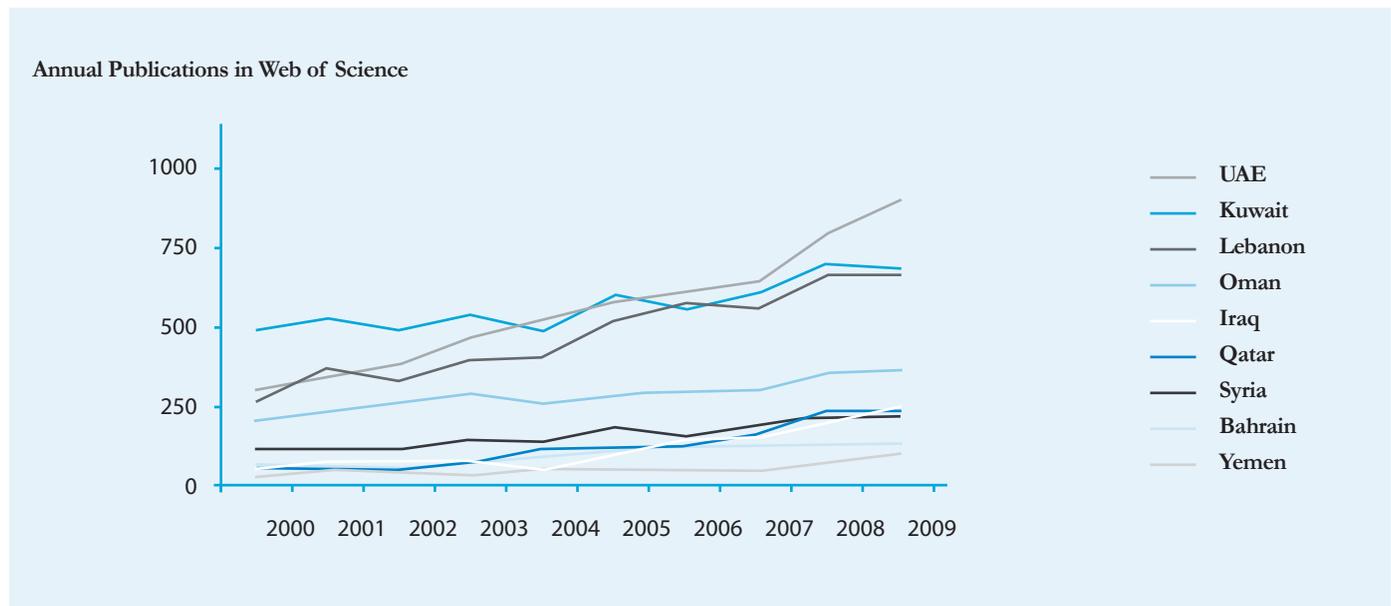
Figure 4.4

**Annual Research Publication Output of the Three Most Producing Countries in the Arab Region and Comparison Countries (Turkey and Iran)**



Source: Thomson Reuters 2011.

**Annual Research Publication Output of the Nine Least Producing Countries in the Arab Region**



Source: Thomson Reuters 2011

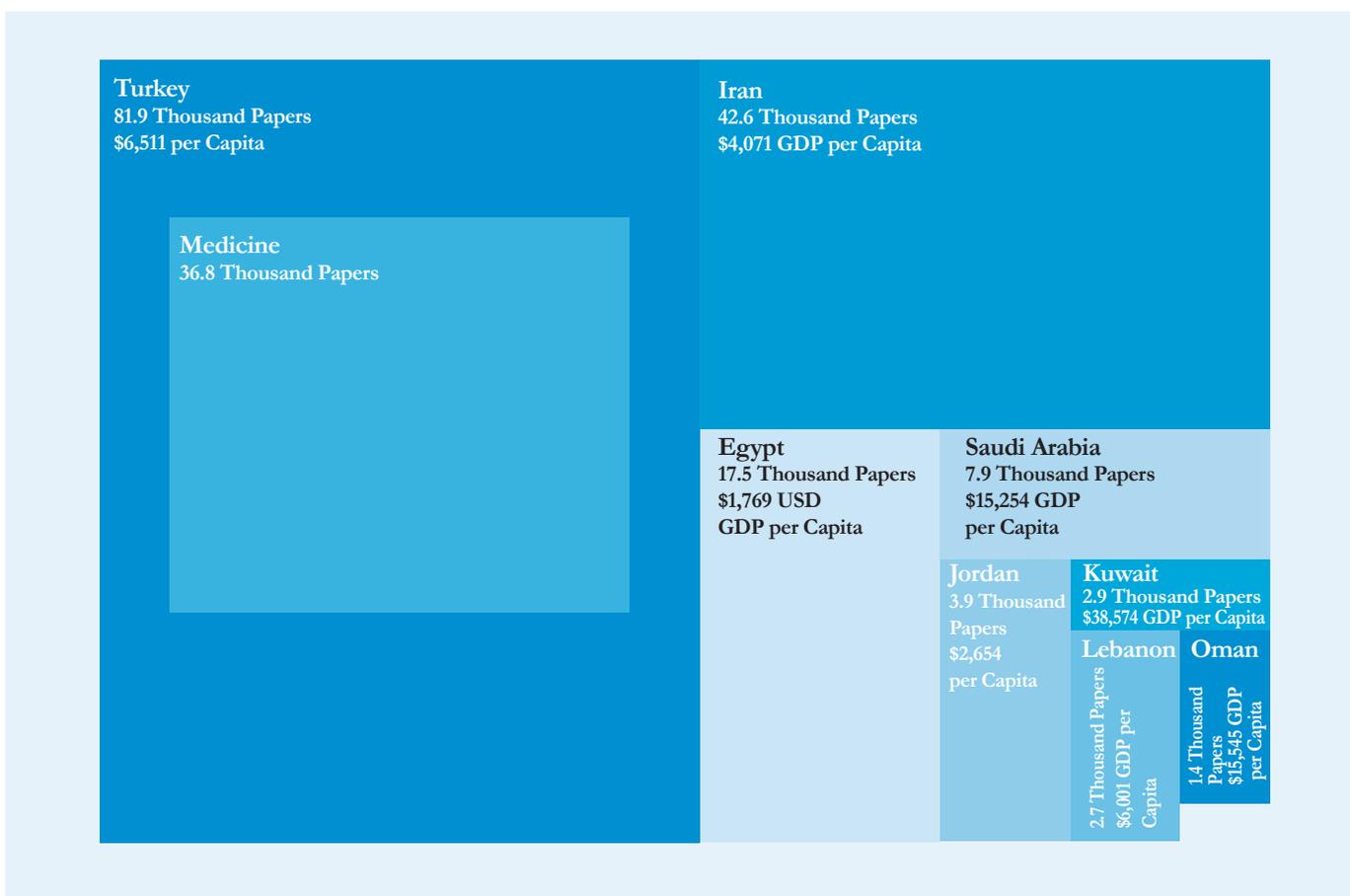
period. As demonstrated in Figure 4.4, Egypt, Saudi Arabia and Jordan have made little progress over the past decade and the share of the three countries increased by about one-third of the production. The UAE has emerged at the head of this group and produced 900 scientific researches in 2009 with a significantly increasing rate since 2000, an indicator of continued progress.

The UAE is followed in this order by Kuwait, Lebanon, Oman, Iraq, Qatar, Syria, Bahrain and Yemen.<sup>59</sup>

Figure 4.5 shows that Turkey produces about half of the total publications of the countries compared, which include six Arab countries in addition to Iran and Turkey. The field of medical science dominated the

Figure 4.5

The Publication Output of Selected Arab Countries and Comparison Countries (Turkey and Iran) (2005-2009)



Source: Thomson Reuters 2011.

Turkey produces about half of the total publications of the countries compared, which include six Arab countries in addition to Iran and Turkey

total of Turkish publications. The share for Iran is about a quarter of the production of the group, while Egypt produces one eighth of the production of the group and the rest is produced by the five other Arab countries combined. Saudi Arabia publishes about half that total.<sup>60</sup>

**Weak Arab Collaboration in Scientific Research**

Collaboration has become a dominant feature in the field of scientific research as it helps countries in sharing experience, costs and resources. Collaboration also facilitates the exchange and exploitation of new knowledge. With its analysis of research interactions between nations in the Middle East – including Arab countries, Turkey and Iran, the Thomson Reuters Global Research Report for 2011 reveals a low level of collaboration in the region. Despite

this situation, some Arab countries such as Egypt, Jordan and Saudi Arabia are relatively frequent research collaborators with around 40% of their domestic output having one or more co-authors from another country. Iran and Turkey have much lower levels of collaboration, while Syria, Yemen, Oman and Qatar have particularly low levels of research connections with other countries. The report highlights the necessity of expanding collaborative research partnerships that would enhance growth and develop joint work with the most developed countries.

In the Arab region, as also appears to be the case worldwide, the most frequent partner in research collaboration is the United States. In addition, there is also a special and repetitive partnership between Saudi Arabia and Egypt. For Egypt, Saudi Arabia is a key partner after the United States. Jordan is the most collaborative nation, with a 43% rate

Table 4.5

Global Share of Research Output for Three Arab Countries and Two Comparison Countries

Turkey		Iran		Egypt		Saudi Arabia		Jordan	
Field	%	Field	%	Field	%	Field	%	Field	%
Agriculture	2.87	Agriculture	1.71	Pharmacy	0.71	Mathematics	0.32	Environment	0.16
Medicine	2.84	Medicine	1.68	Materials Sciences	0.66	Engineering	0.31	Engineering	0.15
Engineering	2.22	Engineering	1.19	Chemistry	0.64	Medicine	0.26	Agriculture	0.15
Plant & Animal Sciences	2.17	Plant & Animal Sciences	1.19	Engineering	0.57	Pharmacy	0.22	Mathematics	0.13
Environment	1.82	Environment	1.16	Agriculture	0.48	Materials Sciences	0.19	Pharmacy	0.12
Materials Sciences	1.67	Materials Sciences	1.05	Physics	0.4	Geosciences	0.16	Chemistry	0.11
Chemistry	1.34	Chemistry	0.93	Microbiology	0.35	Chemistry	0.15	Computer Sciences	0.11
Mathematics	1.30	Mathematics	0.79	Geosciences	0.34	Computer Sciences	0.15	Geosciences	0.10
Pharmacy	1.29	Pharmacy	0.76	Plant & Animal Sciences	0.32	Physics	0.14	Plant & Animal Sciences	0.09
Neurosciences	1.25	Neurosciences	0.60	Mathematics	0.31	Microbiology	0.13	Medicine	0.07
All fields	1.70	All fields	0.87	All fields	0.36	All fields	0.17	All fields	0.08

Note: Analysis of the most representative fields in each country.  
Source: Thomson Reuters 2011.

of research collaboration. Egypt appears to hold a pivotal role in linking collaborations within the region as well as with Europe, North Africa, the United States and Japan. UK and Germany are also frequent partners for all the nations.<sup>61</sup>

***Distribution of Research Shares per Specialisation***

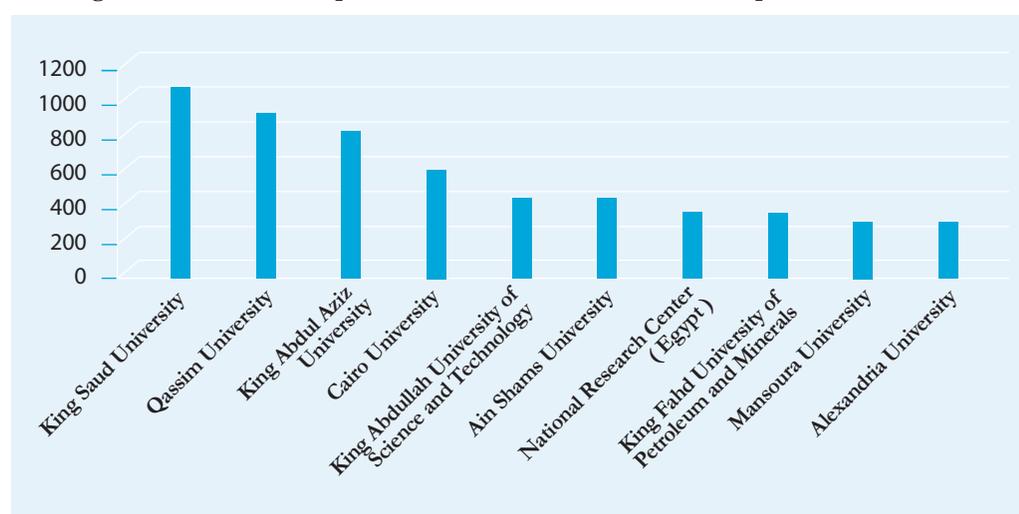
Data from the Arab Scientific Community Organisation (ASCO) concerning Arab publications in 2012 shows that the number of research papers in the fields

of engineering, chemistry, geology, water resources and physics increased significantly. Meanwhile, other areas such as pharmacy and polymer science experienced a decline. Water resources, for example, ranked 14th in 2013 with the publication of 250 research papers, while it was ranked 20th in 2012 with 164 research papers. On the other hand, Arab universities differed in the number of papers they published in 2013. Saudi Arabia recorded the highest rate with 993 research papers published by King Saud University, 835 by Qassim University, 738 by King Abdulaziz University (KAU) and 368 by

Collaboration has become a dominant feature in the field of scientific research as it helps countries in sharing experience, costs and resources. Collaboration also facilitates the exchange and exploitation of new knowledge

Figure 4.6

Ranking of Arab Universities per Number of Published Research Papers in First Half of 2013



Source: Arab Educational, Cultural and Scientific Organisation 2013. (Reference in Arabic)

The achieved efforts of the Arab countries in higher education and scientific research, although important, did not yet translate into distinct output, in comparison with other regions in the world

KAUST (Figure 4.6). Table 4.5 shows the share of specialised research publications in five countries, including three Arab countries, from the global production in the period extending from 2005 to 2009. The table reveals some similarities in research interests between these countries and the specific orientations of each of the five countries.

### ***Use of Scientific Research Output***

The achieved efforts of the Arab countries in higher education and scientific research, although important, did not yet translate into distinct output, in comparison with other regions in the world. It is hoped that these efforts increase and that the output of science and scientific research improves, compared to the progress these countries already achieved during the last decade. The Global Research Report reveals that the rate of use of research output, measured by the number of scientific citations in the Arab countries, has been increasing according to knowledge measures. The report shows that at the start of the 1990s, research citations in the five countries – Turkey, Iran and the three largest producers of scientific research among Arab countries, i.e. Egypt, Saudi Arabia and Jordan – did not exceed a quarter of the world average. However, in 2009, the citation rate rose to half of the world average rate. This average differs from one country to another, and among the different scientific research fields. Based on the same scale, we find that among the highly cited papers in the world, Jordan's share is 0.28%, while that of Egypt is 0.26% and Saudi Arabia, 0.25%.<sup>62</sup>

### ***Patents***

Patents registered within the competent offices in the United States and Europe are considered an appropriate criterion for assessing the extent of the youth and scientists' participation in new technological innovations worldwide. As indicated in Table 4.6, the number of registered patents by the Arab countries remains low compared to the production of other countries, except for Saudi Arabia (which surpassed Turkey

and Greece in the total number of patents registered since 1963). The total number of registered patents in 18 Arab countries since 1963 till 2013 reached 1,821, which was less than that of Malaysia.<sup>63</sup>

It seems that innovation does not represent a major component of Arab projects in science and technology. This may be attributed to the weakness of the overall links between research and development in the public and private sectors, as evidenced by the weakness of the output of registered patents. Chapter 1 discussed the progress of the Arab countries in terms of global competitiveness with regards to innovation and development and in terms of the global

**Table 4.6**

**Patent Production of Arab Countries and Selected Countries According to the US Patent and Trademark Office**

Country	Patents (2013)	Patents (1963 to 2013)
Saudi Arabia	237	858
Kuwait	84	272
Egypt	34	212
UAE	18	120
Lebanon	7	101
Morocco	1	78
Tunisia	4	37
Jordan	6	36
Syria	0	22
Oman	3	18
Qatar	7	18
Algeria	0	14
Iraq	0	10
Bahrain	2	8
Sudan	0	7
Libya	0	4
Yemen	0	3
Mauritania	0	3
Arab Countries Combined*	403	1821
Malaysia	214	1892
Finland	1221	19513
South Korea	14548	118443
Germany	15498	375692
Greece	65	815
Turkey	74	417
Philippines	27	509

Source: US Patent and Trademark Office 2014.  
\* Report team calculations

## Box 4.7

### Steps to Support Innovation and Entrepreneurship in Egypt

1. The development of a Technology Incubators Programme to support these incubators, which employ a large number of graduates, through the provision of a range of financial incentives
2. The establishment of a number of research and development centres in collaboration with international companies. Among the most important of these centres:
  - The Nanotechnology Research Centre in collaboration with IBM, the Cairo University and the Nile University;
  - The Orange Wireless Network Centre in collaboration with the National Telecommunications Institute;
  - The Cairo Microsoft Innovation Centre (CMIC) that specialises in Arabic translation and the development of technological solutions for the Middle East and Africa region;
  - The Centre of the French company Valeo that specialises in international vehicles software and applications.
3. The support of research projects within the framework of an initiative to support research collaboration between universities, research centres and information systems companies (Information Technology Academia Collaboration, ITAC) through four sub-programmes that encourage scientific research for the production of viable products or ideas that are beneficial to the industrial sector, and through financial support that can reach up to 3 million Egyptian pounds per project, as in the case of the Advanced Development Project.
4. The establishment of a centre of excellence for research and development in the field of information extrapolation and computer models in the sectors of tourism and oil, in partnership with the Egyptian universities, specialised companies and Egyptians working abroad. Another excellence centre for wireless technology and electronics and one for mobile services will be established in collaboration with the Egyptian universities.
5. The establishment of a centre of excellence for software engineering, in collaboration with international companies, to provide technical support for companies and support them to get international certification (Capability Maturity Model Integration – CMMI).
6. The establishment of a Technology Development Fund and the support of small businesses operating in the field of innovation, research and development.

Source: United Nations, Economic and Social Commission for Western Asia 2011. (Reference in Arabic)

## Box 4.8

### Arab Initiatives Supporting Knowledge and Innovation

#### Education Reform for Knowledge Economy (EFRKE), Jordan

ERFKE is a major Jordanian education initiative specifically targeted towards at the knowledge economy. Phase two of the initiative is running until 2015. Jordan's Education Initiative (JEI), launched in 2003, won the UNESCO prize for the use of ICTs in education. Today, 6,000 IT graduates enter the workforce annually.

Source: International Communication Union (ITU) 2012b. (Reference in Arabic)

#### King Abdulaziz City for Science and Technology, Saudi Arabia (KACST)

This city represents the national scientific agency in Saudi Arabia and its national laboratories at the same time. The function of the KACST includes the drafting of scientific and technology policies, data collection, foreign research funding and services such as the patent office. Among the KACST's main responsibilities is to support national innovation and technology transfer between research and industry institutes.

Source: King Abdulaziz City for Science and Technology 2014. (Reference in Arabic)

#### Innovation Programme in Information and Communication Technology, Tunisia

The basic drivers of this programme include encouraging research and development activities under the leadership of the key players in the field of production and contributing to projects with high technological value, especially in the digital economy.

The main objectives include the development of new types of partnerships between the public and private sectors; the establishment or development of companies geared towards innovation and that include research and development activities in the process of socio-economic development in the medium and long term; the contribution to building a structured ecosystem that allows the development of information and communication technology; the assistance of operators to access their technical activities to the optimal level and the formulation of new commercial offers through innovative solutions in order to meet users' requirements: (security, quality of service and ergonomic aspects; and the translation of innovation to competitive excellence.

Source: United Nations, Economic and Social Commission for Western Asia 2011. (Reference in Arabic)

The total number of registered patents in 18 Arab countries since 1963 till 2013 reached 1,821, which was less than that of Malaysia

innovation guide, which is called Global Innovation Index by the European Institute for Business Administration (INSEAD).

However, this does not negate progress in these areas. The analysis shows that some Arab countries have made progress in the transition to economies that are relatively characterised, to a greater degree, by knowledge, innovation and economic diversification, particularly the UAE, Bahrain, Oman, Saudi Arabia and Kuwait, as well as Jordan, Tunisia and Lebanon. These countries witnessed several political initiatives that have contributed positively to building the capacities of national innovation for education reform, new universities and new research institutions; to supporting entrepreneurs and incubators of start-ups; and to disseminating an advanced infrastructure for information and communications technology. The most evident changes were in the Gulf region, where the abundance of financial resources sped up the implementation of the initiatives to build knowledge and innovation.

---

It seems that innovation does not represent a major component of Arab projects in science and technology

### **Development in the Arab Region and Its Economic and Political Directions**

---

As highlighted earlier, the problematic side of the relationship between the youth and knowledge localisation “lies in the question of development in the region and the extent to which it succeeds in expanding youth opportunities and developing their abilities”. Young people’s readiness to transfer and localise knowledge is primarily a development issue. Moreover, the transfer and localisation of knowledge is inseparable from development in its economic, political and social aspects. Hence, Arab development is a broad new sense of development, one that is based on knowledge, freedom requirements and social justice that enables young people to effectively integrate in the transfer and localisation of knowledge and drive development forward.

Human development reports issued by the UNDP since 1990 to today have

contributed to the evolution of the concept of development. Development was no longer measured primarily by the per capita income, but rather by health and education levels. UN reports evolved from that concept to include indicators related to the contribution of women and the different poverty scales within nations. Amartya Sen<sup>64</sup> also developed this concept by linking development to freedom.

This Arab Knowledge Report adopted a concept of development that focuses on a very important dimension without which development cannot be achieved; it is social justice, which is based on the triad: 1) the development of individuals’ capacities; 2) the development of protective policies and enabling environments in education, economy and health; and 3) the development of active citizenship based on equality, participation and non-discrimination. The concept of social justice in this sense includes but also goes beyond the conditions presented by Amartya Sen, to achieve a third condition, which is citizenship, along with equality, participation and non-discrimination.

Consequently, this part of the report provides an analysis of the reality of development in the Arab region, in its economic and political dimensions, focusing on clarifying the philosophy of Arab development and building its institutions. With this analysis, we complete the dimensions that we targeted in this chapter by discussing the status of enabling environments and their effectiveness in the transfer and localisation of knowledge.

### **The Status and Challenges of Arab Economic Growth: Disparity in Performance between Countries in the Region and the World**

The Human Development Report 2014 showed the performance disparities between the Arab countries. Five Arab countries appeared within the very high development index with Qatar ranking first among Arab countries and 31st globally, followed by Saudi Arabia in the 34th place,

then UAE (40). Bahrain and Kuwait ranked 44 and 46 respectively while Mauritania came at the bottom of the region's list at 161 followed by Sudan (166) and Djibouti (170). The report indicated that the Arab region includes six countries from the high human development group; Libya, Oman, Lebanon, Jordan, Tunisia and Algeria (they ranked 55th, 56th, 65th, 77th, 90th, 93rd respectively). There are also five Arab countries in the medium human development group, namely Palestine, Egypt, Syria, Iraq and Morocco (they ranked 107th, 110th, 118th, 120th and 129th, respectively). Countries in the low human development group are Yemen, Comoros, Mauritania, Sudan and Djibouti (they ranked 154th, 159th, 161th, 166th and 170th respectively).<sup>65</sup>

The report pointed out that the performance level of the Arab region was lower than the rest of the world in terms of population growth, the average years of schooling, the proportion of the population with secondary education and the Human Development Index, which includes several indicators: literacy rates among adults and youth, school enrolment rates and life expectancy at birth. The region's rates did not exceed the global average except in the level of GDP per capita.

According to the Human Development Index for 2014, the average human development index of Arab countries was about 0.682, which is higher than that of countries with medium human development (0.614) and of countries with low human development (0.493). It is also lower than the global index (0.702) and that of countries with high human development (0.735). Moreover, it is much lower than the index of countries with very high human development (0.890).<sup>66</sup>

The Arab region has been witnessing events and changes that have created instable situations and economic deterioration in the countries affected.<sup>67</sup> Preliminary estimates of the impact on Syria and Yemen, two countries that are facing severe economic and social repercussions, reveal a strong negative impact on growth, the fiscal deficit, employment, poverty and the obstacles hindering progress in other economic activities. Similarly, reports indicate an economic slowdown in the middle-income oil-importing Arab countries that had undergone these changes and political events, specifically Egypt and Tunisia. While this is the case in these countries, the recent rise in oil prices led to a positive performance of the overall economy in 2011-2012 in oil-exporting

The problematic side of the relationship between the youth and knowledge localisation “lies in the question of development in the region and the extent to which it succeeds in expanding youth opportunities and developing their abilities”

Figure 4.7

### Human Development Index in the Arab Region and the World (1980-2013)



Source: UNDP 2014. (Reference in Arabic)

countries mainly, as well as a brighter economic outlook in the medium term. Given the region's noticeable disparity in growth, the socio-economic trends in the ESWA annual report have led to the conclusion that more disparities will be produced between these countries on the register of the Millennium Development Goals, especially if they continue beyond 2015.<sup>68</sup>

### The Problematic of Wealth and Development: Poverty Gap and Inequality

The achievements of the Arab countries in the field of development are mostly limited to quantitative achievements. In education, and while enrolment ratios in various stages of education are experiencing a steady improvement, the quality indicators are still far from international standards (See Chapter 3 on Knowledge Effectiveness).

Concerning health, we notice an improvement in life expectancy at birth from 51 to 71 years in the period between 1960 and 2012. The Mashriq and Maghreb countries recorded a 60% decline in maternal mortality and the Gulf countries recorded percentages similar to those in developed countries. But the Least Developed Countries in the Arab region are still recording high mortality rates

equal to twice the rate of the region. The same applies to access to safe water, and even more for the reduction of hunger and malnutrition.<sup>69</sup> The same also applies in other development indicators, where human development reports have indicated that the majority of Arab countries are still facing difficulties in achieving sustainable economic development. Those difficulties are evident in the fluctuating economic growth rates (Figure 4.8).<sup>70</sup>

The achievements of the Arab countries in the field of development are mostly limited to quantitative achievements

#### Box 4.9

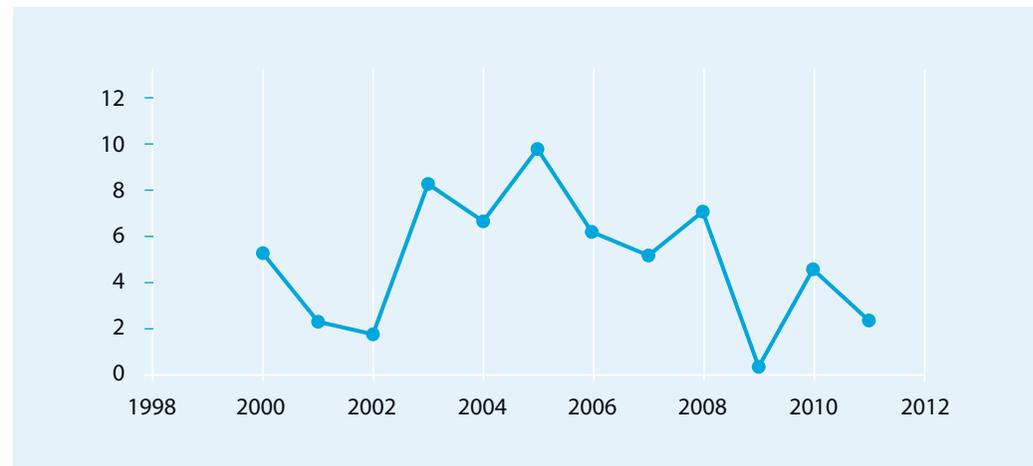
##### World Happiness Report

This index is issued in partnership with the Earth Institute at Columbia University and Sustainable Development Solutions Network for the United Nations. The index was built on a number of important development indicators, including health indicators such as life expectancy; indicators related to governance regarding perceptions of corruption; indicators about income (per capita GDP); and other indicators such as freedom of choice and social support. The index is measured on a 10-degree scale. The World Happiness Report for 2013 indicated that Denmark ranked 1st globally with a rate of 7.693 and the UAE ranked in the 14th place globally and 1st among Arab countries with a rate of 7.144, no more than 0.56 degrees behind Denmark. Oman ranked 23rd globally and 2nd in the Arab world with a rate of 6.853. Qatar ranked 27th globally and 3rd in the Arab world with a rate of 6.666, while Egypt ranked 130th, Yemen 142nd and Syria 148th out of 156 countries.

Source: Helliwell et al. 2013.

Figure 4.8

#### GDP Growth Rate at Constant Prices for Arab Countries



Source: Arab Monetary Fund 2012. (Reference in Arabic)

In addition, the Arab countries showed a marked disparity in the distribution of income and the GDP per capita. While the average GDP per capita of the Arab region as a whole was USD 16,367 in 2012, it ranges between USD 40,658 and 133,713 in the oil economy countries (which represent 13.3% of the Arab population and 50.3% of the Arab GDP). On the other hand, it did not exceed USD 3,996 in any of the countries dependent on the export of raw materials, which represent 18.6% of the population, and 4.6% of the Arab GDP. The maximum GDP per capita reached USD 14,527 in countries with a mixed economy, which represent 21.6% of the Arab population and 18.9% of the Arab GDP. The share of the countries with a diversified economy, which represent 43.7% of the Arab population, amounts to 25.7% of the total Arab GDP with a maximum GDP per capita of USD 16,509.<sup>71</sup>

### The GDP per Capita Gap in Arab Countries and Its Consequences

Data show that the distribution of natural resources and geographical factors have caused a gap in the national income of the Arab countries as evident in Table 4.7, revealing a wide disparity in the GDP per capita from one country to another. While in Qatar the GDP per capita is USD 133,713, it does not exceed USD 1,493 in Comoros.<sup>72</sup>

#### **Poverty**

According to the international poverty line (USD 1.25 per person per day), the proportion of the population living in poverty in the Arab region seems very small and does not exceed 7.4%.<sup>73</sup> The poverty scale indicates a significant decline in poverty levels since 1990, but this sharp decline of the population living under the poverty line does not allow an objective comparison in relation to material poverty among the Arab countries and other developing regions. We notice when estimating the level of poverty using the standard of two dollars per person per day, this percentage increases dramatically.<sup>74</sup> Therefore, the quantitative

Table 4.7

GDP per Capita in Arab Countries in 2012

Country	GDP in 2012 (Million USD)	Per capita GDP in 2012 (Million USD)
Bahrain	53.6	40658
Kuwait	273.7	84188
Qatar	274.2	133713
Saudi Arabia	1436.8	50791
UAE	525.1	57045
Iraq	473.3	14527
Algeria	491.7	12779
Egypt	862.5	10685
Jordan	71.6	11340
Lebanon	73.1	16509
Morocco	227.5	6818
Tunisia	74.4	10612
Comoros	1.1	1493
Mauritania	11.2	2938
Sudan	125.4	3370
Yemen	95.3	3996
Arab Region	5098	16367

Source: UNDP 2014. (Reference in Arabic)  
Note: PPP prices for 2011

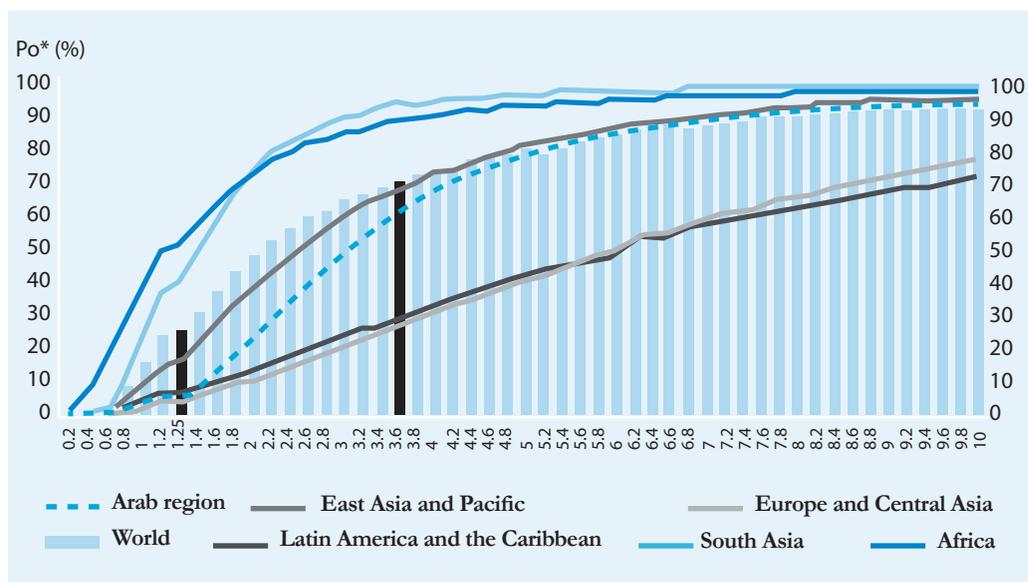
measurement of poverty must include food security and the essential needs that ensure human dignity and citizenship rights.

Human development reports reveal that the true values of per capita consumer spending did not increase in most of the Arab countries to achieve tangible results to reduce poverty, based on the results of national surveys of income and households expenditure. The distribution of income also did not show any signs of significant improvement. It is interesting that this reality is incompatible with indicators that show a significant increase in the rate of the GDP per capita since 1990 to today.<sup>75</sup> This indicates that the Arab region has failed to build effective mechanisms and create social policies to protect large segments of society from falling into poverty, given that poor people hold a marginal position in economic systems that seek social justice while failing to establish mechanisms for participation and accountability.

The majority of Arab countries are still facing difficulties in achieving sustainable economic development

Figure 4.9

Poverty Levels in Arab Countries and Developing Regions According to Various Poverty Lines 2009-2000 (in PPP 2005)

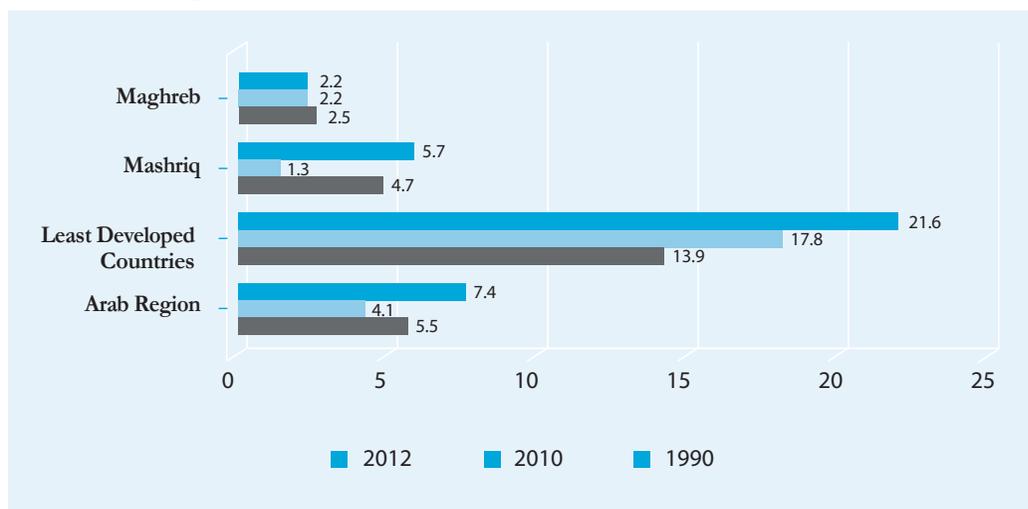


Source: ESCWA and the League of Arab States 2013. (Reference in Arabic)

According to the international poverty line (USD 1.25 per person per day), the proportion of the population living in poverty in the Arab region seems very small and does not exceed 7.4%

Figure 4.10

Poverty Levels in Arab Countries as per the International Poverty Line USD 1.25/Day per Person



Source: ESCWA and the League of Arab States 2013. (Reference in Arabic)

Figure 4.9 shows how the selection of National Poverty Lines clearly affects the estimated poverty rates everywhere in the world, but more importantly in Arab countries. We notice that poverty rates drastically increase with a poverty line of three dollars per person per day. Reports show that the rate of the decline of poverty in the Arab region is one of the slowest globally and is not enough

to have a significant impact on poverty in the near future. Poverty in the Arab region is primarily centred in rural areas, which reflects the severity of the great disparity between rural and urban development. Moreover, despite the fact that the majority of the Arab population lives in rural areas, the contribution of agriculture, the main economic activity in these areas, does not exceed 15% of the total Arab GDP.<sup>76</sup>

The Arab Development Challenges Report 2011 presented a significant comparison between the performance of the Gross National Income per capita and the human development indicators. This comparison revealed that all the Arab countries, with the exception of Tunisia, Jordan and the Comoros, were below the regression line that separates countries with a gross national income higher than their human development index on the one hand, and countries with a gross national income lower than their human development index on the other. Thus, with the exception of Tunisia (2010), all the Arab countries, which have been classified in the Global Human Development Report at a higher level, are still lagging behind in human development compared to their income levels. This means that most of the Arab countries could achieve higher levels of human development if they enjoyed the same degree of efficiency that characterises their counterparts in the developing world.<sup>77</sup>

By reference to the scale of human poverty (non-material poverty), which includes three aspects - health, education and the level (or quality) of life - we find that the rate of human poverty in the Arab region fell from 31% in 1997 to 23% in 2007.<sup>78</sup> Human

poverty has decreased at a slower rate in the Least Developed Arab Countries, where the rate fell from 40% in 1991 to only 34% in 2007. The Gulf countries have achieved the highest rates of decline in the human poverty index standing at 45%, with a significant progress in Kuwait, Qatar, Oman

**Table 4.8**

**Percentage of Population Living under National Poverty Lines**

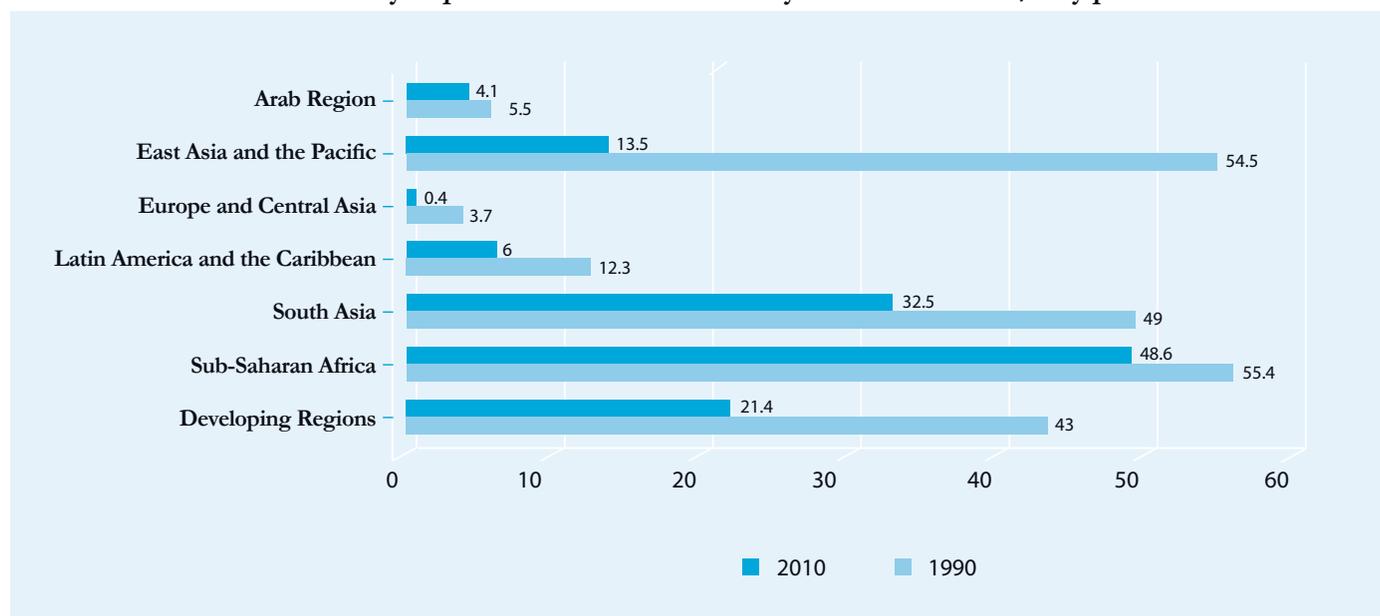
Country	Year	Poverty rate (%)
<b>Mashreq</b>		
Egypt	2011	25.2
Iraq	2012	18.9
Jordan	2010	14.4
Lebanon*	2005	8
State of Palestine	2011	25.8
Syria*	2007	12.3
<b>Arab Maghreb</b>		
Morocco*	2007	9
Tunisia	2010	15.5
<b>Less Developed Countries</b>		
Mauritania*	2008	42
Sudan	2009	46.5
Yemen	2005	34.8

*Sources: World Bank 2014a, and \* Abu-Ismaïl et al. 2011.*

Human development reports reveal that the true values of per capita consumer spending did not increase in most of the Arab countries to achieve tangible results to reduce poverty

**Figure 4.11**

**Prevalence of Extreme Poverty as per the International Poverty Line of USD 1.25/Day per Person**



*Source: ESCWA and the League of Arab States 2013. (Reference in Arabic)*

and the UAE. Despite this decline, reports on the Millennium Development Goals show that the index is still high compared to the national income per capita.<sup>79</sup>

### ***Inequality***

The issue of equality is one that is currently given priority in national dialogue about social justice in many Arab countries or other countries seeking growth. The issue of equality and social justice is directly related to the issue of social cohesion, which is closely associated with strong economic growth and the development of a human capital able to contribute effectively to the knowledge economy and society. Social inequality is also linked to the issue of gender. Inequality is strongly reflected in the status of women economically and socially and also on important issues such as the quality of life, education, citizenship and social environment. Acute inequality, particularly among the youth, often results in political and social instability in these various areas.

Most international studies tend to measure inequality with the Gini coefficient. According to this coefficient, Arab countries are among the developing countries with the least disparity in income distribution, where the average Gini coefficient estimates the status of the distribution of income in the Arab region by about 39.5%. This rate is considered acceptable if compared with those of some Asian countries such as China (48.2 %), the Philippines (45%) and Thailand (40%).<sup>80</sup> However, some criticise this measurement and consider it not enough to estimates of the Gini coefficient only because of its reliance on consumer surveys that tend to exclude the 5% of people with the highest income, thus resulting in relatively moderate inequality rates.<sup>81</sup>

### **The Structure of the Economy Remains That of the Rentier Model**

The lack of adequate infrastructure and the weakness of public economic structures in the Arab region are two of the most important challenges facing the transfer

and localisation of knowledge. The rentier economic pattern prevailing in the region is characterised by these economic structures and it neither motivates the processes of the transfer and localisation of knowledge nor the effective integration of the youth in these processes. The great reliance on oil production and its export has resulted in the threat of relying on a single non-renewable economic source. The economic abundance caused by this rentier economy resulted in a large degree of neglect of the enabling economic environments that are centred on knowledge as a renewable economic resource characterised by its readiness for transfer and dissemination and for the achievement of the greater added value. Knowledge economies are also characterised by the intensive use of technology and digital technology with rapid development, high productivity revenues and influence on the shape of modern society. Oil revenues supported a pattern of development that is led by the services sector at the expense of the productive sectors, making the region the least industrial among developing regions, including sub-Saharan Africa. Moreover, the contribution of agriculture in the GDP has already reached the minimum.<sup>82</sup>

Despite the fact that the economies of non-Gulf countries are less dominated by oil and gas, mining and public utilities still hold 31% of the GDP in these countries, while they do not provide jobs for more than 1% of the population. In parallel, manufacturing remains significantly marginal, as it contributes to the GDP by 10% and only employs 8% of the labour force. One of the tragedies is represented in the limited contribution of agriculture (12%) to the GDP, while about 13% of the population is still working in this sector, which reflects this sector's cognitive and technological recession. The services sector contributes the highest share in the GDP and absorbs the highest share of the labour force (52%), while this rate drops in the GCC countries (42%). The types of services available in the Arab countries occupy the lowest rings of the value chain, and consequently provide little contribution to the development of local knowledge.<sup>83</sup>

Inequality is strongly reflected in the status of women economically and socially and also on important issues such as the quality of life, education, citizenship and social environment

#### Box 4.10

##### Common Characteristics among the Arab Countries Based on the Attributes of the Rentier Economy

Despite the large differences between the countries of the Arab region in terms of the economic situation and social structures, there is a set of characteristics that constitute a series of similarities and represent a common denominator, combining all the Arab countries. The weak economic diversity and the high concentration in a limited number of economic sectors is one of the most important of these characteristics, in addition to the rentier management of the sources - including the non-natural sources - and the low employment rates with high rates of young highly skilled expats.<sup>84</sup> Add to this the inflation of the public sector, the weak climate for investment, the brain drain, the trade imbalance in favour of import and export concentration in low value-added commodities, which reflect the weakness of knowledge economies and the prevalence of the rentier economy.

Source: Hanlik 2012.

##### **Arab Countries' Poor Export of Advanced Manufacturing Products**

In general, the ratio of exports to the GDP in the region amounts to 28% and their openness to trade is still relatively weak. Protection regulations on foreign trade play a negative role as well, according to estimates by the IMF.<sup>85</sup> However, the main factors behind poor exports do not lie in overprotection itself, but in the weakness of export industries in terms of competitiveness; the focus of exports on low value-added products and the lack of labour force skills that could advance export industries. The flaw in the revenue-generating structure of the economies of the region reflected negatively, as we have seen, on the size and structure of foreign trade.<sup>86</sup> Raw materials still dominate the Arab export composition, as fuel constitutes 70% of the region's exports. These percentages are even higher in oil countries, reaching 80%. As for the export composition of countries with little or no oil, it is the most diverse, however, dominated by exports of textile and clothing up until 2005.<sup>87</sup>

The importance of the growth of high value-added products, and the resulting revenue that reflects on the rates of export, lies in the belief that it is a central process in the transfer, production and localisation of knowledge. Moreover, knowledge and innovation development and shaping them into moulds which facilitate their use by the industry sector, production firms and national services, the production of advanced technological goods and their exportation are all significant indicators in measuring society's knowledge and innovation capacity. Many international organisations, including the World Bank, use these indicators and the country's percentage of high-technology exports to compare the different levels of knowledge and innovation capacity that countries have reached.

The readiness of the Arab world, in terms of technological productivity, capacity and commercial weight in the technological production chain, is measured through a number of indicators issued by the World Bank and the Global Competitiveness Report shown in Table 4.9. The Global Competitiveness Report's Value Chain Breadth indicator assesses the "presence" or involvement of the country in the steps of the value chain.<sup>88</sup> On a scale of 1 to 7, countries close to 7 have had a broad presence across the entire value chain. The 2013-2014 results show that many Arab countries have scored a higher value than the average 3.5 and some Arab countries (Qatar 10, UAE 18, KSA 28, and Lebanon 41) even scored higher ranks than China (43), Turkey (42), and Canada (57).<sup>89</sup>

In terms of Venture Capital Availability in the Global Competitiveness Report 2013-2014, Qatar came in second worldwide, followed by the UAE (10), Oman (14), and Bahrain (15), reflecting the direction taken by the Gulf countries in this regard, while Yemen scored very poorly (134).<sup>90</sup> On another hand, the quasi-absence of high-technology exports (as a percentage of manufactured exports) in 2011 is apparent in certain countries such as Qatar, Bahrain, Yemen and Djibouti. While Morocco scored the highest percentage in the Arab

Raw materials of low added value still dominate the Arab export composition, as fuel constitutes 70% of the region's exports

Table 4.9

## Indicators of Trade in Technological Goods

Country	Value Chain Breadth (Scale of 1 to 7) 2013-2014 (a)		Venture Capital Availability (Scale of 1 to 7) 2013-2014 (a)		High-Technology Exports (% of Manufactured Exports) 2011 (b)	Trade of Manufactured Goods 2009 (c)	
	Global Rank (of 148)		Global Rank (of 148)			% of GDP	KAM Index
	Value		Value				
Qatar	5.2	10	4.5	2	0	-	-
UAE	4.9	18	4.1	10	***3	-	-
Saudi Arabia	4.5	28	3.4	25	*1	13.25	0.36
Lebanon	4.1	41	2.7	62	2	38.01	6.22
Jordan	3.9	49	3.9	14	3	36.09	5.86
Bahrain	3.9	51	3	45	3	52.18	8.38
Oman	3.9	53	3.8	15	0	-	-
Morocco	3.8	61	3	44	6	63.09	9.01
Egypt	3.7	76	2.8	56	*8	32.54	5.32
Mauritania	3.6	79	2.9	51	1	-	-
Kuwait	3.2	111	1.9	132	-	-	-
Yemen	3.1	121	2.6	71	**1	-	-
Libya	3.2	113	1.9	134	0	16.54	1.17
Algeria	2.7	143	2	128	-	-	-
Syria	2.6	145	2	123	0	23	2.28
Sudan	-	-	-	-	*1	-	-
Tunisia	-	-	-	-	-	13.82	0.54
Djibouti	-	-	-	-	**0	30.74	4.86

\* World Bank database 2010 \*\* World Bank database 2009 \*\*\* World Bank data 2009

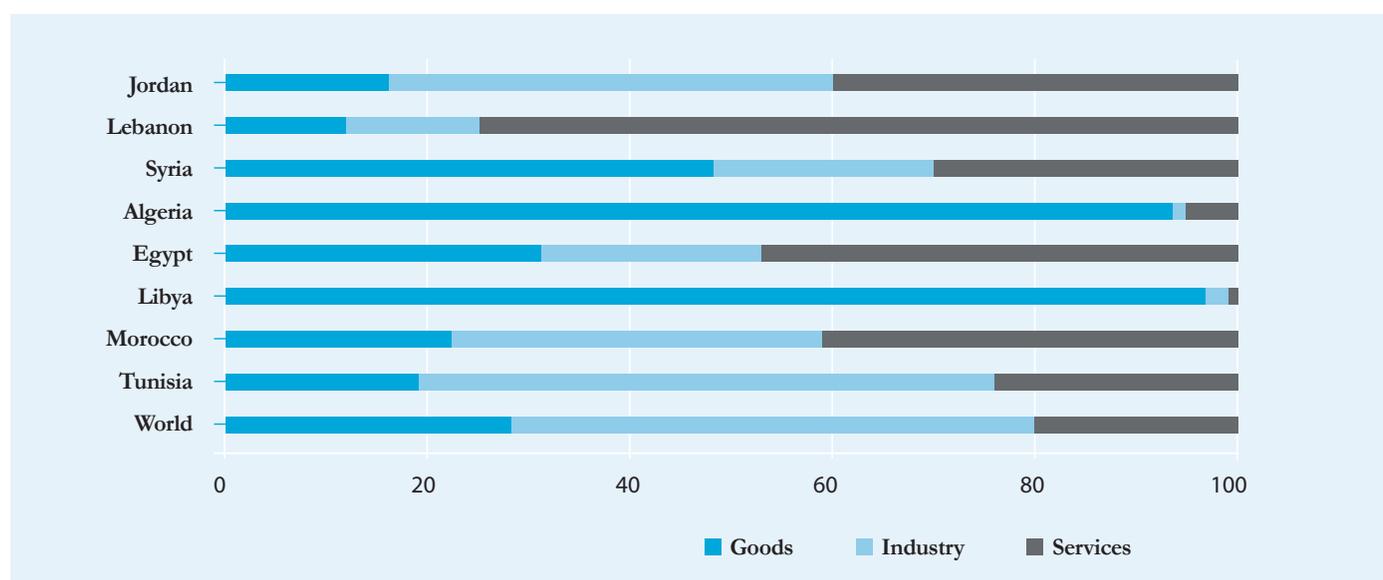
References: a. World Economic Forum 2013 - Global Competitiveness Report 2013-2014

b. World Bank database 2014, World Bank 2014a

c. World Bank KAM database 2012, World Bank 2012a

Figure 4.12

## World and MENA Export Composition



Source: Hanflik 2012

region (6%), which remains modest on a global level compared to the Philippines (49%) and Singapore (45%) scoring the highest percentages. The USA's percentage on the other hand was 18%, Germany's 15%, and India's 7%.<sup>91</sup>

**Weak Labour Market, Foreign Direct Investment and Investment Environment<sup>92</sup>**

The report had previously discussed two important issues indicative of the weakness of the labour market in the Arab world in general. The first is related to the rigidity of the labour market, regulations, and all related financial institutions and banks. The second is the incompatibility or rather the gap between the youth's skills and knowledge (outcomes of education) and the requirements of the labour market, which has led to the unemployment and marginalisation of many young people.<sup>93</sup>

In this part of the report, we discuss the investment climate and the environment of foreign direct investment. Studies have shown that the investment climate is correlated with the encouragement of foreign direct investment, reform of the legislation and regulations governing work, reduction of corruption and evasiveness in problem solving, and re-examination and restructuring of the role of the public sector to achieve a competitive and transparent environment.

Moreover, the establishment of a market economy needs the reform and development of the region's heritage in terms of skills in marketing, trade and entrepreneurship, financial institutions and banks and governance of the public sector. It also requires accessibility to project funding in accordance with encouraging and supportive regulations, and the Arab countries are not starting from scratch. However, it is imperative to expand the scope of reform of all these structures in order to expand the bases of existing ones and achieve a level of effectiveness in the localisation of knowledge, creation of job opportunities for the youth and their integration into

the aspired knowledge society.<sup>94</sup> In a study conducted by the World Bank in 2013<sup>95</sup> focusing on the Ease of Doing Business index in more than 180 countries, Arab countries did not achieve good rankings (see Table 4.10).

Foreign direct investment is an effective tool in the transfer and localisation of knowledge and technology. It also supports sustainable development in the Arab region and helps improve the economic situation of the youth. FDI has played an important role in the region since 2002. However, it was affected by the global economic crisis, which led to a decline in foreign direct investments – down to 7% in some Arab countries as of 2011. The Arab region witnessed a small FDI impact centred in the sectors of real estate and petrochemicals, which are considered fertile lands for the rapid growth of job opportunities. However, this is not the case for the

The establishment of a market economy needs the reform and development of the region's heritage in terms of skills in marketing, trade and entrepreneurship, financial institutions and banks and governance of the public sector

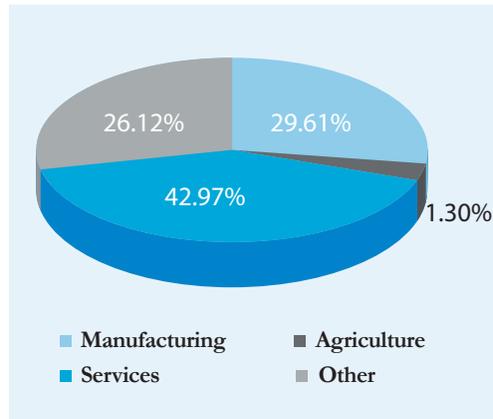
**Table 4.10**  
**Ranking of Arab Countries on the Ease of Doing Business Index**

Country	2013
UAE	23
Saudi Arabia	26
Bahrain	46
Oman	47
Qatar	48
Tunisia	51
Morocco	87
Kuwait	104
Lebanon	111
Jordan	119
Egypt	128
Yemen	133
State of Palestine	138
Sudan	149
Iraq	151
Algeria	153
Comoros	158
Djibouti	160
Syria	165
Mauritania	173
Libya	187

**Note:** The Ease of Doing Business index ranks economies from 1 to 189, where countries with the highest rankings enjoy business-friendly environments.  
*Source: The World Bank & the International Finance Cooperation 2014.*

Figure 4.13

### Distribution of Foreign Investment per Sector



Source: Khalid Wazani, background paper for the report.

transfer and localisation of knowledge that these countries need in their quest to build a knowledge society and develop science and innovation.<sup>96</sup>

FDI received by Arab countries dropped from US\$68.6 billion in 2010 to \$43 billion in 2011, a decline of 37.4%. The value of FDI received by Arab countries accounted for 2.8% of the world total, which amounted to \$1.5 trillion and around 6.3% of investments received by developing countries, which amounted to \$684.4 billion. The performance of Arab countries varied in terms of investment, with high levels in Algeria, Bahrain, Djibouti, Iraq, Jordan, Kuwait, Morocco, State of Palestine and UAE, and low levels in Lebanon, Mauritania, Oman, KSA, Somalia, Sudan, Syria and Tunisia. Saudi Arabia was the Arab country that received the highest FDI with \$16.4 billion and a share of 38.2% of the total, followed by the UAE with \$7.679 billion (17.9%), then Lebanon in third place with \$3.381 billion (7.9%), and Sudan in fourth place with \$2.692 billion (6.3%).<sup>97 98</sup>

Figure 4.13 illustrates the distribution of foreign investment by sector, showing that most investments primarily focus on service sectors, with a smaller focus on productive sectors, namely those related to industry and production sectors, which have a direct impact on and correlation with the transfer and localisation of knowledge.

Box 4.11

### Attracting FDI in Arab Countries

The Business Environment Index 2012 reports that, over the past six years, many Arab countries (18 in total) have improved their laws and legislation to make them more encouraging and attractive for investment. The unemployment rates that exceed 16% in the Arab region, according to Arab Labour Organisation estimates, as well as the low level of women's participation in the labour market are considered to be among the region's economic weaknesses, and they both negatively affect the ability to attract foreign investment. As such, it may be important for the Arab region to address the laws in force in order to improve the level of women's participation in the national economy, through the provision of equal opportunities and encouraging the participation of women in economic, social and political life, noting that women constitute half the Arab population. The above factors have also affected the ability of Arab countries to attract foreign investment that is beneficial for the transfer and localisation of knowledge, despite these countries' central role in global energy production with 58% of the world's oil reserves and almost 30% of natural gas reserves. The Arab region's share of total foreign investment worldwide was limited to less than 3% in 2012 and only 6.3% of total foreign investment received by the developing world.

Source: Khalid Wazani, background paper for the report.

### Governance and Institutional Quality

The concept of governance is defined as the practice of authority for managing the affairs of the state or its national institutions, be they political, economic or administrative. Good governance is a concept that relates to the capacity of the public "institution" or civil society to manage public resources in such a way that fulfils the requirements of development and progress, in favour of human welfare. The UNDP considers good governance as one of the most important ingredients for sustainable human development, provided that it is based on three pillars: (1) accountability and transparency, (2) participation, and (3) the rule of law.<sup>100</sup> The World Bank and the International Monetary Fund (IMF) refer to six main indicators to measure good governance and institutional quality around

FDI received by Arab countries dropped from US\$68.6 billion in 2010 to \$43 billion in 2011, a decline of 37.4%

## Box 4.12

### The Turkish Experience in Youth Empowerment in Terms of Production and Knowledge

Since 2001, Turkey has initiated economic restructuring policies in various fields, starting with the liberalisation of the economy, to the creation of an investment-friendly environment and the improvement of the macroeconomic performance. Between 2002 and 2012, Turkey achieved an annual growth rate of 5% and significantly attracted FDI amounting to US\$36 billion in 2002 and \$153 billion by the end of 2012. Returns from tourism have also increased from \$8.5 billion in 2002 to \$25 billion in 2012. It is worth noting that 50% of Turkey's population is under the age of 30, and that its population growth rate is the highest among the Organisation for Economic Cooperation and Development (OECD) countries, as the number of inhabitants in Turkey reached 76 million people in 2012. Turkey has boosted science, technology, creativity and innovation, spending \$3 billion on research and development in 2002 and \$10.8 billion in 2011, i.e. an increase of 260%. Turkey is currently focusing on research-based science and technology policies, and is moving towards the promotion of creativity and innovation through entrepreneurship in technology, and through the transfer and localisation of technology. Turkey's second area of focus is the development of human resources, especially the youths who are involved in creativity and innovation. Furthermore, Turkey focuses on research, development, creativity and innovation as a key mechanism in economic development. In general, Turkey's experience in scientific research is based on the following pillars:

- Human resources development policies;
- Identification of skills required by the private sector and review of school curriculums in all educational stages;
- Orientation of education and training systems to focus on research and development activities;
- Adoption of joint programmes between the private sector and universities in research and development and student training;
- Adoption of the mandatory internship project for university graduates in private sector companies;
- Adoption of the mandatory practical training policies for university students in work while still in school;
- Orientation of secondary education students towards a mandatory course in design and technology;
- Promotion of Public – Private Partnership (PPP) projects;
- Evaluation of the work institutions and granting them facilities according to four criteria:
  - Technology and innovative thinking in the project;
  - Structure and comprehensiveness of project plan;
  - Impact of the project on the level of competitiveness and development;
  - Analysis of its compatibility with the market and marketing strategies.
- Evaluation of students in schools and universities according to advanced knowledge and skills standards
- Improvement of vocational and educational training (VET) programmes.

Source: Sirin Elci, background paper for the report.

Most investments primarily focus on service sectors, with a smaller focus on productive sectors, namely those related to industry and production sectors, which have a direct impact on and correlation with the transfer and localisation of knowledge

## Box 4.13

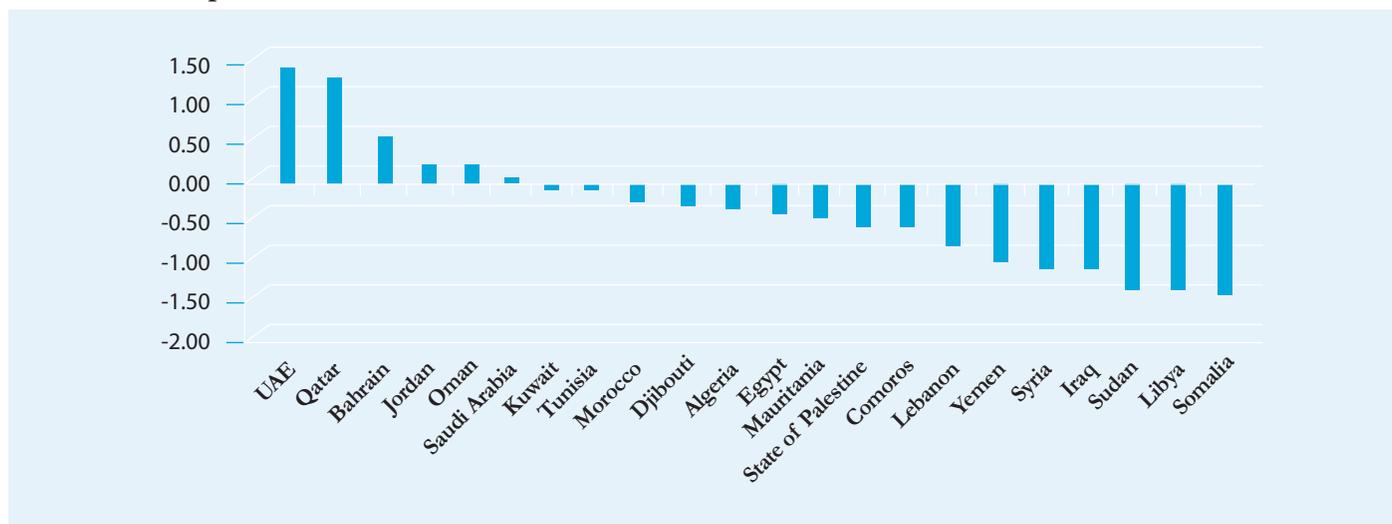
### Misconception of the Liberalisation of the Economy in Arab Countries

Studies reveal that most Arab countries have confused the “liberalisation of economy” with “privatisation” in their efforts towards restructuring the economy and promoting the private sector. They have understood privatisation in a narrow sense, i.e. a transition from state-owned public property to private property. However, privatisation, in essence, means transition towards a philosophy of market freedom and its integration into the global economy. Moreover, it is a comprehensive process whereby states move towards modernity in its contemporary form and build foundations for the knowledge economies and knowledge community. The market liberalisation philosophy means starting from the current economic structures in the Arab world towards comprehensive reforms that enhance competitive advantages, restructure commerce in order to increase exportation, build global networks in R&D, attract FDI, reform the labour market and build strong democratic institutions.<sup>99</sup> Furthermore, studies confirm that foreign direct capital is essential as a basic element in the transition to the free market philosophy, the success of modernisation efforts, private sector development, knowledge transfer and exploitation and creation of new jobs that require high levels of knowledge and skills. This ensures integration into global market policies. Yet, such integration and transition into knowledge economies need the help of global economic blocs and developed countries that are ahead in their transition towards advanced economies, through bilateral conventions and trade agreements as well as lifting barriers to free trade and starting arrangements that lead to integration. In this respect, studies confirm that Arab countries need now more than ever to accomplish a regional integration that enables them to exploit their wealth in localising knowledge in the Arab region, and to achieve full integration with the global market. The integration of Arab economies would ensure a competitive advantage, whether in terms of human resources, wealth or a large commercial market. It also provides the Arab region with an advantage in negotiation with various other global economic blocs. Sources: Saidi 2005

Source: Saidi 2005.

Figure 4.14

Control of Corruption



Source: World Bank 2014b.

Studies show that the Arab region still scores low in governance indicators with varying degrees between countries

the world, namely, (1) rule of law, (2) voice and accountability, (3) government effectiveness, (4) political stability, (5) regulatory quality, and (6) control of corruption.<sup>101</sup>

Studies show that the Arab region still scores low in these indicators,<sup>102</sup> and has done since the World Bank began to measure the indicators of good governance and to calculate its rates in 1996. The percentile rank of the majority of Arab countries has remained the same, despite the disparity in ranks between countries. The World Bank statistics in 2013 show that despite the progress, the process remains a slow-moving one in comparison to countries of Eastern Europe and East Asia. These figures show institutions' poor performance and quality in terms of governance and exercise of authority. Despite the progress achieved in some countries, the Arab region's rate is only higher than that of African countries, which has the world's lowest scores.<sup>103</sup>

However, the disparity between Arab countries is stark across the various indicators. Qatar and the UAE, for example, registered high rates in the "control of corruption; 1.24 and 1.29 respectively. The rank of these two countries is close to that of USA (1.28), and France (1.3), while Denmark has ranked first on this indicator with a rate of 2.41. However, the rates of other countries,

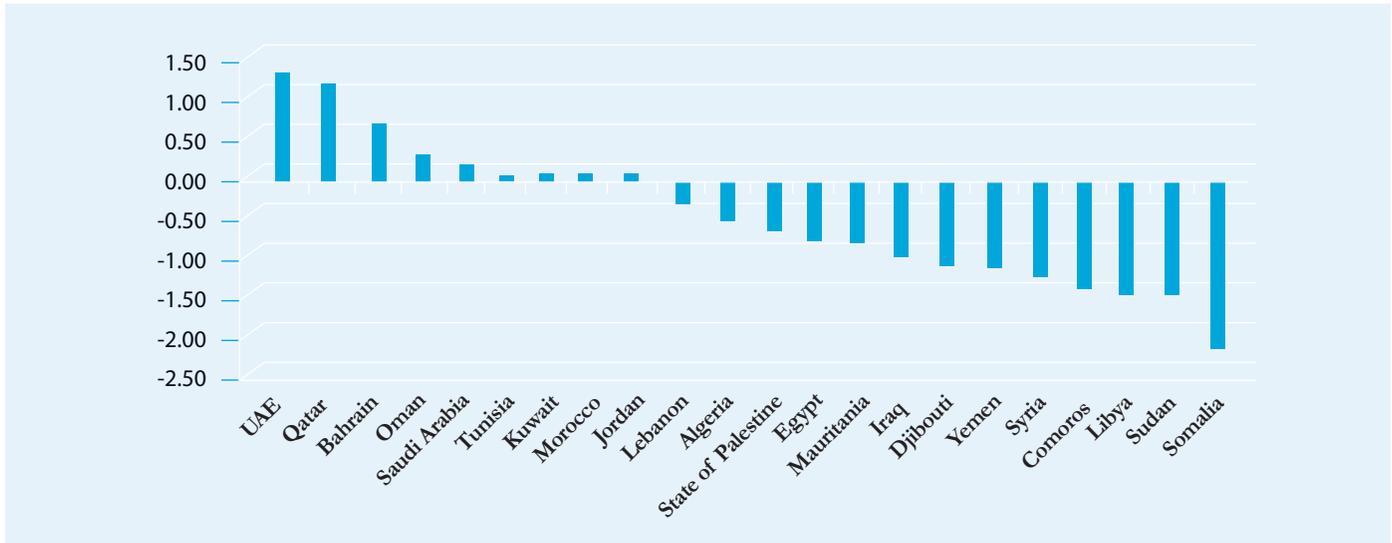
such as Libya (-1.52) and Somalia (-1.58) are among the lowest globally. This shows that in specific countries, governance indicators are in desperate need of improvement and support.<sup>104</sup>

The rule of law indicator also shows this disparity between the Arab countries. The 2013 rates indicate that Yemen, Libya, Iraq, Lebanon and Djibouti ranked the lowest, while Qatar, Oman and Kuwait ranked the highest. The rule of law indicator measures the availability of fair legal frameworks that guarantee the full protection of human rights, especially for minorities. It indicates the existence of an independent and neutral judiciary authority. Countries with low such rates reveal the close relation between stable security and citizen's perception on the ability of laws to protect their rights. In the political stability indicator, we notice that the Gulf countries have scored the highest, while Yemen, Lebanon and Iraq have scored the lowest, as is the case with the rule of law indicator.

The government effectiveness index also shows great disparity between the Arab countries. Qatar and the UAE topped the list, scoring 1.17 and 1.07 respectively, while Somalia (-2.21), Sudan (-1.53), and Libya (-1.5) have been listed at the bottom since 1996.<sup>105</sup> We notice a close relation in the

Figure 4.15

Governance Index



Source: World Bank 2014b.

countries with the highest ranks, between their rates and their high annual per capita income.

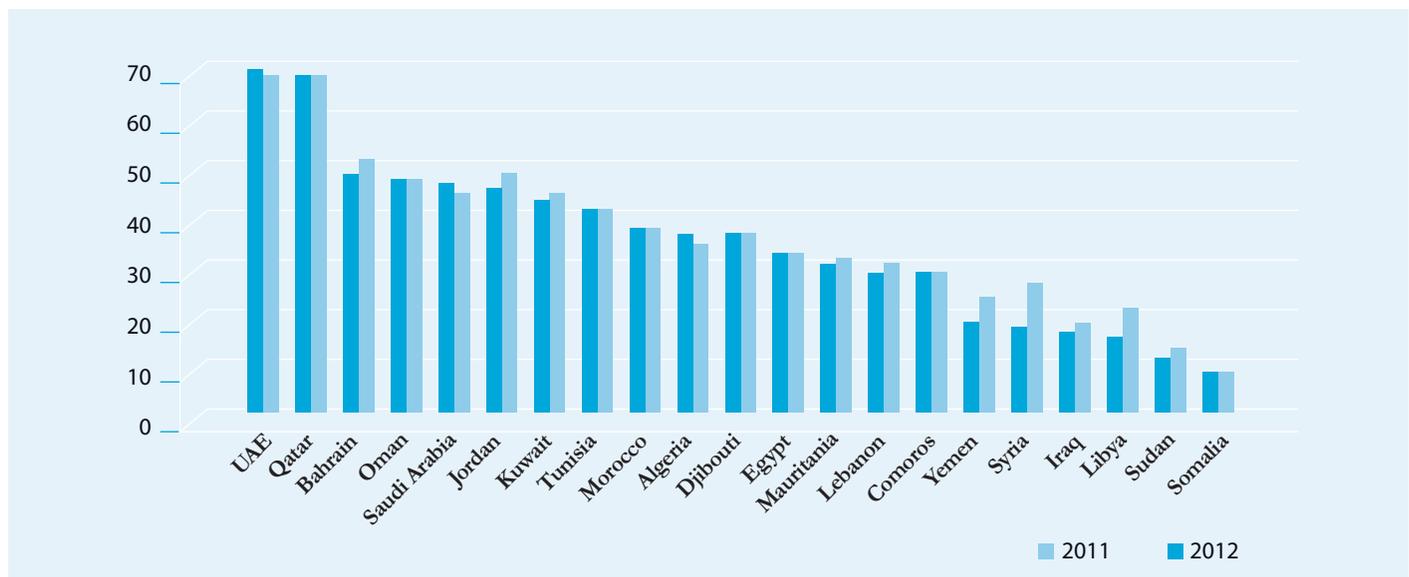
Accountability cannot be discussed separately from corruption. The low governance rates of the Arab countries are directly related to their ranking on the Corruption Perception Index, issued by Transparency International. On a scale of 0 to 100, where 0 refers to the highest levels of corruption. The rates of all Arab countries were below 50, except

for the UAE and Qatar, which scored 69 and 68 respectively. This can be traced to a number of factors including the adoption of e-government practices and the use of the internet.<sup>106</sup>

There is consensus among many researchers that the lack of good governance, weak management of the economy and the absence of institutional quality are the main reasons behind the failure of many Arab countries to encourage the private sector,

Figure 4.16

Corruption Perception Index



Source: Transparency International 2013

The lack of good governance, weak management of the economy and the absence of institutional quality are the main reasons behind the failure of many Arab countries to encourage the private sector, to attract FDI, and use available resources efficiently to improve the labour market and eliminate unemployment and poverty

Laws constitute successful tools for ensuring the integrity of societal life, regulating relations among individuals and groups, and giving all citizens a feeling of justice under authority

to attract FDI, and use available resources efficiently to improve the labour market and eliminate unemployment and poverty.<sup>107</sup>

In this context, it was found that many oil-producing Gulf countries had succeeded in attracting highly-skilled workers to improve their work environments and accelerate economic growth. These efforts, however, were mostly in the oil sector, while the needed change was not brought about in others. This shows the adverse effects of having petroleum as a natural wealth on the management of the economy.<sup>108</sup> Furthermore, non-oil exporting countries also struggle with gaps in development. Although these countries are not considered poor in terms of resources, they have an abundance of labour power and agricultural opportunities. Some of these countries, such as Jordan, Tunisia, Egypt and Morocco managed to improve their development factors by liberating the economy, encouraging development and attracting direct foreign investment. The development rates in these countries, however, remained low in comparison with countries that achieved progress. Researchers note that the slow pace of development in the majority of oil exporting and non-oil exporting countries of the region is not attributed to

a lack of resources but rather to inadequate management of the economy and weak institutional quality.<sup>109</sup>

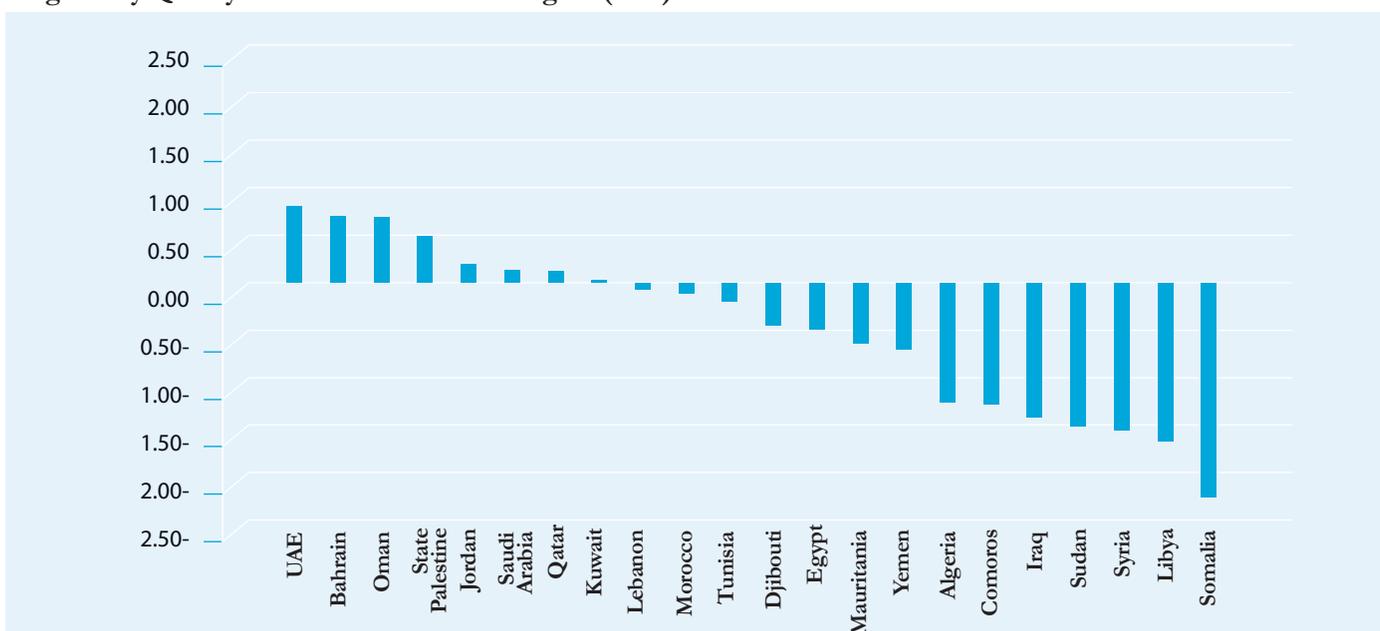
Various studies highlight the many reasons behind the poor economic performance of Arab countries, such as reforms not conducive to government performance, the adoption of policies unfavourable to productivity and low competence in managing the economy.

### Regulatory Structure and Rule Of Law

There is no doubt that the regulatory structure, the rule of law for protecting intellectual property, guaranteeing political stability and fighting corruption form an efficient mechanism that guarantees the transfer of knowledge and supports its localisation. Laws constitute successful tools for ensuring the integrity of societal life, regulating relations among individuals and groups, and giving all citizens a feeling of justice under authority.<sup>110</sup> It is important to note that the majority of Arab countries have endorsed the concept of rule of law and have passed protection laws.<sup>111</sup> However, World Bank data shows a great disparity in regulatory quality and rule of law indicators between the Arab countries.

Figure 4.17

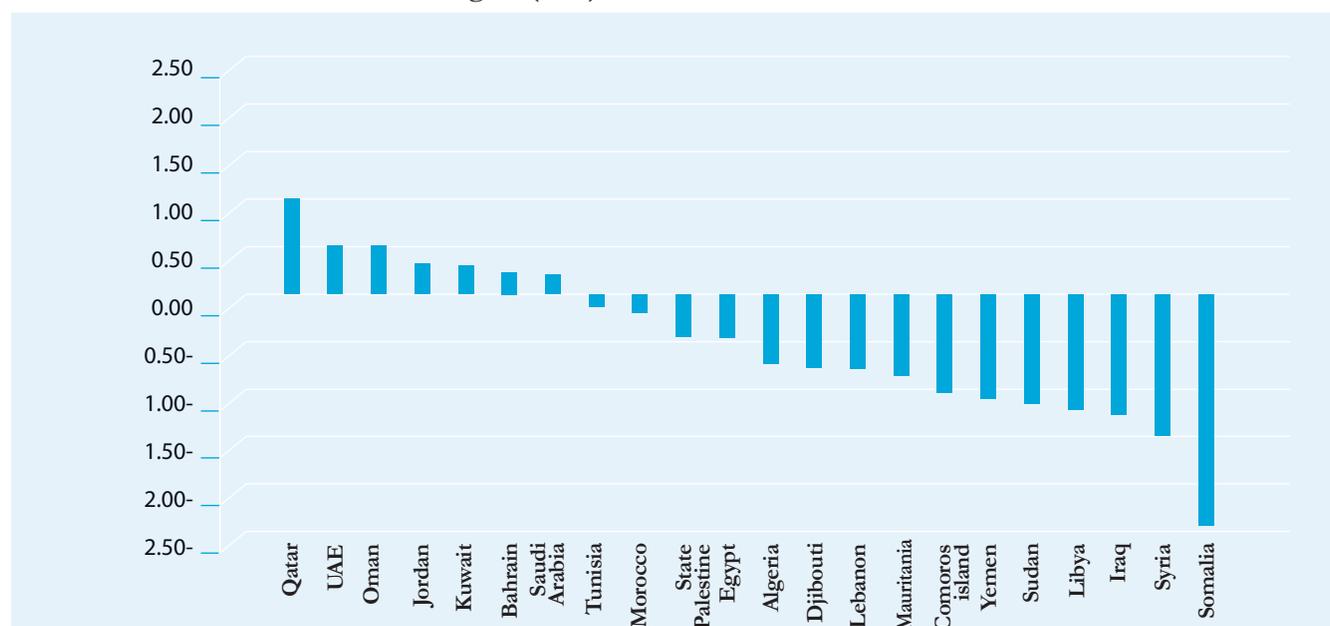
Regulatory Quality Indicators in the Arab Region (2013)



Source: World Bank 2014b.

Figure 4.18

Rule of Law Indicators in the Arab Region (2013)



Source: World Bank 2014b.

In terms of the quality of legislation, the UAE (0.78), Bahrain (0.6) and Oman (0.47) take the lead among the Arab countries, while Libya (-1.83), and Somalia (-2.21) rank the lowest (Figure 4.7). As for the rule of law, Qatar (1.11) and the UAE (0.64) ranked the highest while Syria (-1.611) and Somalia (-2.21) ranked the lowest.<sup>112</sup>

### Information Technology Infrastructure: Readiness and Implementation

The ICT infrastructure is a main component in the knowledge economy. It is the key determinant of the infrastructure and level of competitiveness of a macro economy based on knowledge, creativity and innovation. The efficiency of the technological structure constitutes a main factor in achieving transparency and flow of information, improving the climate of economy management and attracting investments, especially FDI. This supports the process of the transfer and localisation of knowledge and youth integration. The readiness of the infrastructure and its accessibility depend on the success of technology in achieving these goals, in addition to the efficiency of its investment in society. Arab countries have taken measures to increase the use of

internet, computers and mobile phones. Despite this, as mentioned in the first chapter of this report, the gap still exists.

The penetration of computers in the Arab World remains much lower than

Table 4.11

Percentage of Households with Computer

Country	Percentage
Algeria (2010)	20
Bahrain (2012)	92.7
Djibouti (2010)	13.01
Egypt (2012)	37.92
Iraq (2008)	18.2
Jordan (2012)	54.6
Kuwait (2012)	82.31
Lebanon (2011)	71.50
Mauritania (2010)	2.99
Morocco (2012)	43.06
Oman (2011)	58
State of Palestine (2012)	53.94
Qatar (2012)	91.51
Saudi Arabia (2010)	57.3
Sudan (2012)	14
Syria (2010)	40.37
Tunisia (2010)	19.10
UAE (2012)	85.2
Yemen (2010)	3.96

Source: ITU Statistics 2014.

The penetration of computers in the Arab World remains much lower than the developed countries, except for Gulf countries

The GCC and Tunisia achieved advanced ranks worldwide in terms of the use of ICT in public services, such as hospitals

the developed countries, except for Gulf countries, notably Bahrain, Qatar and the UAE, whose rates draw close to those of most developed countries in the number of computers per 100 inhabitants. Bahrain ranked first in the Arab world, with 92.7% of its households owning a computer, followed by Qatar (91.51%), and the UAE (85.2%). As shown in Table 4.11, the majority of the remaining Arab countries scored low in comparison to the Gulf countries and the rest of the world.

At the end of 2014, only 36% of households in the Arab countries were connected to the internet, a rate that is lower than the global average (43.6%). The gap is smaller when we consider the number of internet users, which is around 40% in the world and 40.6% in the Arab world. This disparity in the results can be traced to the lack of land phone services in households in the Arab world, which forces the youth to use the internet outside the house or on their phone. Three Arab countries ranked 23th, 24th, and 29th globally in the Networked Readiness Index

for 2014: these are respectively: Qatar, the UAE and Bahrain.<sup>113</sup>

These indicators highlight the position of the Arab region in terms of (1) internet infrastructure, degree and price of access indicators, (2) telecom networks that are increasingly important to the use of the internet through smartphones and 3G, and (3) use of internet in governmental and social services.<sup>114</sup>

The Internet Price Basket indicator comprises the prices of land and mobile phones and internet subscription, and is determined as a percentage of the GNI per capita. In 2012, it ranged between 0.4 in Qatar, which occupies the second place globally, and 0.5 in the UAE (rank 7) and 21.8 in Mauritania, which ranks 134th among 161 countries.<sup>115</sup>

## Use of Mobile Phones in the Arab Region

Table 4.12

### Use of ICT in Public Services

Country	Internet Access in Schools		Use of New Technologies in Businesses	
	Rank (out of 148 Countries)	Value*	Rank (out of 148 Countries)	Value*
Algeria	147	3.2	-	-
Bahrain	30	5.5	45	5.0
Egypt	110	4.2	125	2.7
Jordan	27	5.6	44	5.0
Kuwait	57	4.9	66	4.4
Lebanon	86	4.5	107	3.4
Mauritania	109	4.2	141	2.0
Morocco	95	4.4	113	3.1
Oman	53	5.0	47	4.9
Qatar	10	5.9	15	6.0
Saudi Arabia	15	5.8	49	4.8
Tunisia	70	4.7	-	-
UAE	4	6.1	21	5.8
Yemen	119	4.1	146	1.7

Note: On a scale of 1 to 7 (7 being the highest) according to surveys of users and stakeholders

Source: World Economic Forum 2013.

Table 4.13

### ICT Indicators in the Arab World

Country	Networked Readiness Index*		ICT Development Index (IDI)**		
	World Ranking (out of 148 Countries) 2012	Value in 2014	World Ranking (out of 157 Countries) 2012	Value in 2011	
Algeria	129	2.98	3.07	106	2.98
Bahrain	29	4.86	6.3	39	5.79
Comoros			1.7	138	1.68
Djibouti			1.77	131	1.71
Egypt	91	3.71	3.85	86	3.65
Jordan	44	4.36	4.22	76	3.9
Kuwait	72	3.96			
Lebanon	97	3.64	5.37	52	4.62
Libya	138	2.75			
Mauritania	142	2.61			
Morocco	99	3.61	3.79	89	3.59
Oman	40	4.56	5.36	54	4.8
Qatar	23	5.22	6.54	31	6.41
Saudi Arabia	32	4.78	5.69	50	4.8
Tunisia	87	3.77	3.7	91	3.58
UAE	24	5.2	6.41	33	5.68
Yemen	140	2.73	1.89	127	1.76

Sources: \* World Economic Forum 2014. \*\* ITU 2013.

The level of mobile coverage is not considered a challenge in many areas in the Arab region, with 13 Arab countries exceeding the proportion of mobile subscribers of 100% in 2013.<sup>116</sup> It is worth noting that there are many low-income Arab countries that are not among high income countries that have achieved good mobile charges per minute, as is the case in Egypt.

### Use of ICT by the Government and the Public Sector

E-government is still a concept that is not entrenched in the Arab region. The majority of countries did not score higher than 50% in the e-government services indicator. Some countries, however, consider ICT among the government's top priorities, as is the case in the UAE, Bahrain and Qatar, which achieved high ranks globally.

The United Nations E-Government Survey Report measures the willingness and capacity of governments to use ICT in the provision of public services by presenting the E-government development index. It is a composite index that compares countries on a scale of 0 to 1, with 1 being the highest. It consists of the size and quality of e-services, the status of telecom infrastructure in the country and the needed human capital for the use of internet. We notice in this report that the GCC countries are at the forefront with all of the countries ranking within the top 50 out of 193 countries: Bahrain 18th (0.8089), the UAE 32nd (0.7136), KSA 36th (0.69), Qatar 44th (0.6362), Oman 48th (0.6273) and Kuwait 49th (0.6268). Meanwhile, other Arab countries with low development levels are at the bottom of the list, such as Djibouti (184) and Somalia, which ranked last. Countries such as Libya scored 0 in the index, which means that none of its services are electronic. None of the Arab countries surpass developed countries in terms of e-government services, except for the Gulf countries. The E-participation Index is another indicator that illustrates the extent to which these technologies are used in the decision-making process.<sup>117</sup>

### Use of ICT in Public Services

The GCC and Tunisia achieved advanced ranks worldwide in terms of the use of ICT in public services, such as hospitals. Qatar ranked second in the world in this area, and seventh in terms of internet access in schools.

Based on the above, we deduce that regardless of the efforts of many Arab countries to improve the level of internet access and use of ICT, internet disparity still exists between countries in the region, and it is still defined by their level of income. The GCC countries, for example, remain at the top of the list of the ICT indicators (see Table 4.13), and have high ranks globally. Low-income countries, however, remain at the bottom of the list.

### Problems and Challenges of the Arabic Language and Translation

Considering that language is an incubator of knowledge and culture it must be protected and developed so that it can absorb new and growing content of the knowledge economy and society. This applies to the Arabic language, which now more than ever, has to lose the unbendable moulds that have constrained its progress, in order to enter new spaces of innovation and effective contribution to the production of knowledge. In this general perspective, the Arabic language is facing a number of challenges in the era of knowledge and globalisation, including explicit challenges such as being limited to literature/linguistic mummification and hybridisation, and the decline of educational systems. Other challenges are implicit, such as "claiming the inability of the use of Arabic language in science, internal and external marginalisation, and the rising trend of colloquialism".<sup>118</sup>

Translation is considered an important channel that helps develop the Arabic language, being a process of interaction that reinforces communication and the sharing of knowledge gains. It contributes to the development of the local intellectual product, and opens it up to other

---

Regardless of the efforts of many Arab countries to improve the level of internet access and use of ICT, internet disparity still exists between countries in the region

---

Considering that language is an incubator of knowledge and culture it must be protected and developed so that it can absorb new and growing content of the knowledge economy and society

possibilities by looking at other phenomena from a different perspective. Until now, no new and real initiatives have been put forth to open the door for dialogue and constructive criticism, in order to review the Arabic language and set alternative rules and new linguistic formats that go in line with the requirements of innovation and knowledge production, and the transfer and localisation of knowledge. Such an initiative has to address different intellectual movements and break rigid mind-sets. The lack of such initiatives highlights another

gap in our public cultural, social and political systems on both the regional and national levels in the Arab countries. This gap should be dealt with through a policy of linguistic reform that comprises all the concerned sectors, sets the priorities, and specifies the needed steps. The reform of the language, and subsequently of the Arabic education system, and the capitalisation on information technology should be done according to a vision that aims at building a knowledge society and achieving sustainable human development.

Table 4.14

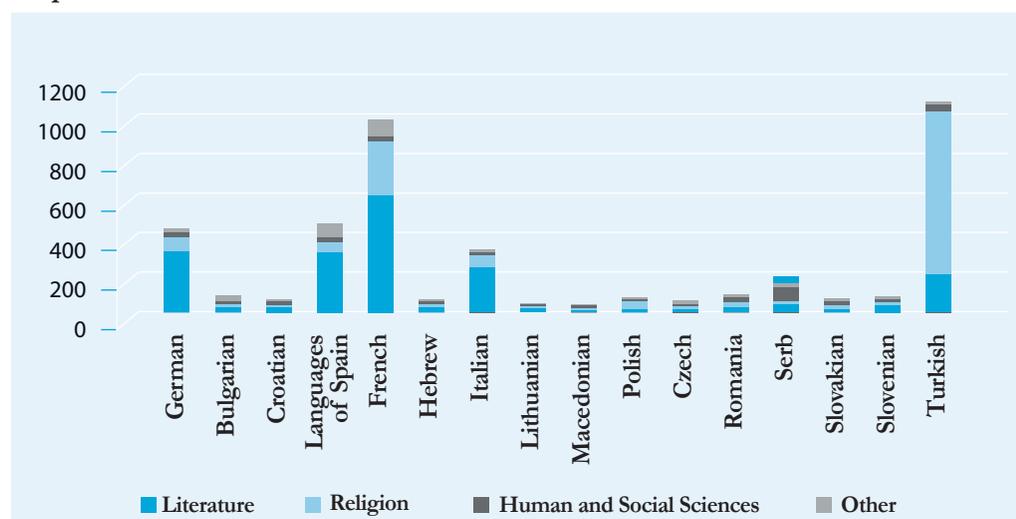
**Ranking of Languages From and into Which Publications are Translated**

Rank	Top 30 Destination Languages (to Which Translations Have Been Made)	Number of Books	Rank	Top 30 Source Languages (from Which Translations Have Been Made)	Number of Books
1	German	301934	1	English	1264944
2	French	240043	2	French	225744
3	Spanish	228557	3	German	208060
4	English	164499	4	Russian	103587
5	Japanese	130649	5	Italian	69538
6	Dutch	111270	6	Spanish	54535
7	Russian	100806	7	Swedish	39976
8	Portuguese	78905	8	Japanese	29241
9	Polish	76705	9	Danish	21250
10	Swedish	71209	10	Latin	19951
11	Czech	68921	11	Dutch	19659
12	Danish	64864	12	Ancient Greek	18049
13	Chinese	63123	13	Czech	17154
14	Italian	59937	14	Polish	14655
15	Hungarian	55214	15	Norwegian	14273
16	Finnish	48311	16	Chinese	14065
17	Norwegian	35161	17	Arabic	12407
18	Greek	30459	18	Portuguese	11566
19	Korean	28168	19	Hungarian	11294
20	Bulgarian	27457	20	Hebrew	10272
21	Serbian	23732	21	Multiple languages	8727
22	Estonian	20508	22	Finnish	8525
23	Romanian	20468	23	Catalan	7991
24	Croatian	19729	24	Serbian	5632
25	Slovakian	19644	25	Romanian	5546
26	Slovenian	18692	26	Estonian	5517
27	Catalan	17972	27	Modern Greek	5113
28	Lithuanian	15389	28	Serbo-Croatian	5002
29	Arabic	12711	29	Korean	4701
30	Turkish	11919	30	Sanskrit	4387

Source: UNESCO 2014c.

Figure 4.19

Proportion of Books Translated from Arabic in EU Countries



Source: *Transeuropéennes and the Anna Lindh Euro-Mediterranean Foundation for the Dialogue between Cultures 2012.*

### The Challenges of Translation

Among the challenges that impede the use of the Arabic language and translation is what is called the “terminology vacuum”, especially when it comes to modern scientific terminologies, as it is difficult to find smooth equivalents in Arabic and adapt the language in favour of science. The issue of the terminology vacuum relates to a large extent to translation, and is faced by the ever-increasing emergence of different translations for one term and one connotation. This highlights the need for an Arabic Corpus, which can be defined as a huge collection of writings or recordings (which count billions of words), including samples of written and spoken texts from a large spectrum of independent sources. Such a corpus gives an accurate image of the language in its different forms and daily, scientific and literary usages during a specific period of time.<sup>119</sup> This corpus takes on the role of a “laboratory”, from which we can devise various linguistic studies on the structure and phenomena of the language and the different connotations of its words.<sup>120</sup>

Among the efficient factors of the reform process is developing what is known as the Optical Character Recognition, which is a programme available in other main languages. It allows transforming the text

through scanning into a digital text that can be altered and archived.

Among the other challenges that face translation in particular and the language in general is the lack of accurate statistics in terms of volume and quality, the translation of literature and humanities only, the lack of professionalism in the field, and the lack of cooperation between translation institutions and publishing houses, in addition to the shallowness of scientific translation.<sup>121</sup> Table 4.14 shows that the Arabic language ranks low in terms of content being translated (to and from Arabic), despite the huge population of Arabic speakers and even though a large number of countries have Arabic as an official language.

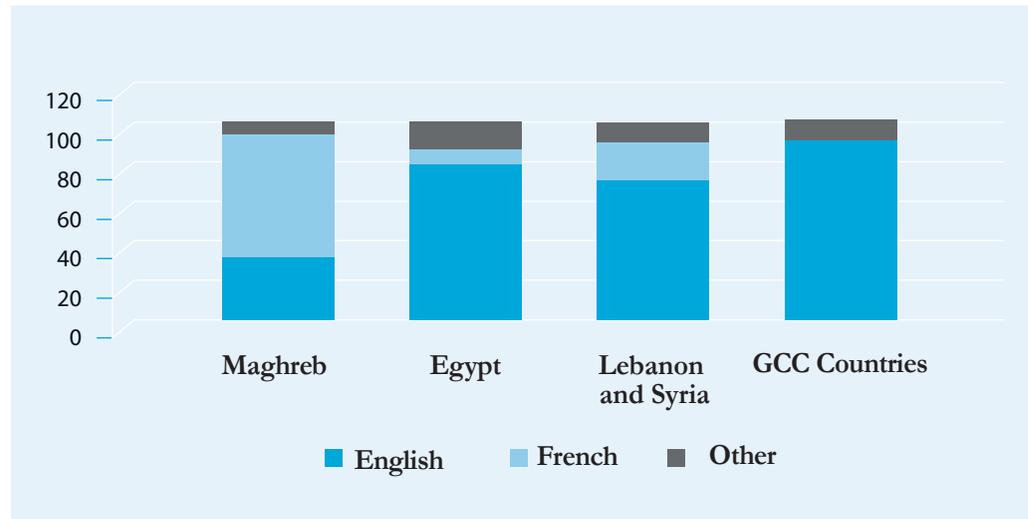
In a study that focused on mapping translation in the Mediterranean countries, the number of translated publications from Arabic into another language was still low, while demand for translation had increased. Figure 4.18 shows the distribution of translations from Arabic per subject and target language.

The same study shows that the percentage of books translated from Arabic in EU countries does not exceed 1/1,000 of the total translated books. In terms of translations into Arabic, estimates show

Among the challenges that impede the use of the Arabic language and translation is what is called the “terminology vacuum”, especially when it comes to modern scientific terminologies

Figure 4.20

Languages into Which Arabic Is Being Translated (%)



Source: Transeuropéennes and the Anna Lindh Euro-Mediterranean Foundation for the Dialogue between Cultures 2012.

Investing in human capital is a priority in translation and languages in the region

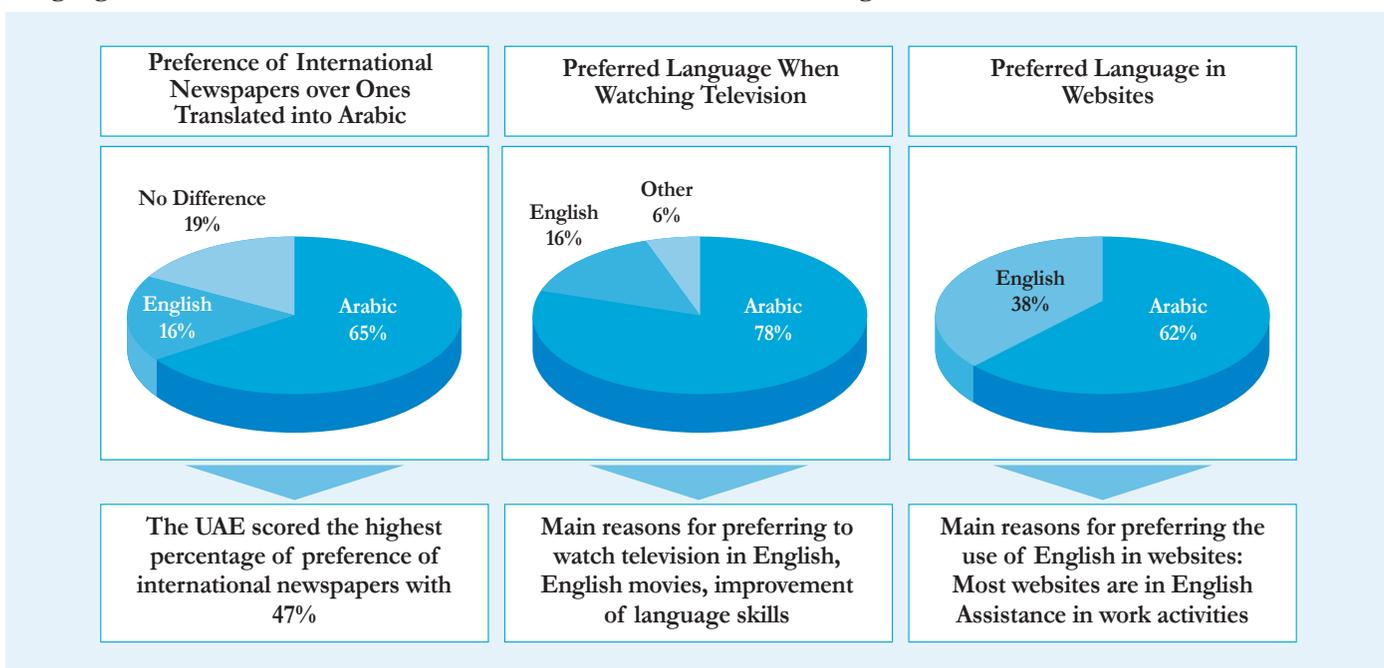
that from 2002-2012, around 1,500-2,000 books were translated per year. The share of Arabic publications from translated texts is 6% globally. Investing in human capital is a priority in translation and languages in the region. The report on translation in the Mediterranean region shows that human capital in translation in the Arab region struggles from lack of moral and financial reward, which is needed and well-deserved by translators.

### Arabic Digital Content

The production and publishing of Arabic digital content face many obstacles, further complicated by the need to overcome the obstacle of internet access. Posting Arabic content on the internet requires adjusting some available technologies to suit the Arabic language. It also requires developing technology solutions to issues that can be sorted under two categories. The first

Figure 4.21

Language Choices in Means of Communication and Media in the Arab Region



Source: ESCWA 2012.

Table 4.15

Status of the Arabic Language among the Top Languages on the Internet 2013

Top Ten Languages on the Internet	Number of Internet Users per Language in Millions	Internet Penetration as a Percentage of the Population	Internet Users Growth (2013-2000)	Internet Users of the Language (of Total %)	Population Speaking This Language (2014) in Millions
English	126 004 565	43.4%	301.4%	26.8%	1 302 275 670
Chinese	103 965 509	37.2%	1 478.7%	24.2%	1 372 226 042
Spanish	742 968 164	39.0%	807.4%	7.8%	423 085 806
Arabic	000 182 99	78.4%	110.7%	4.7%	126 475 664
Portuguese	600 586 82	32.5%	990.1%	3.9%	253 947 594
Japanese	674 422 75	79.5%	174.1%	3.6%	94 842 656
Russian	400 365 65	18.8%	501.2%	3.3%	347 002 991
German	525 779 59	17.2%	398.2%	3.0%	347 932 305
French	000 700 59	42.8%	1825.8%	3.0%	139 390 205
Malay	400 440 39	55.2%	107.1%	2.0%	71 393 343
<b>Top Ten Languages</b>	<b>333 957 615 1</b>	<b>36.4%</b>	<b>421.2%</b>	<b>82.2%</b>	<b>4 442 056 069</b>
<b>Other Languages</b>	<b>483 557 350</b>	<b>14.6%</b>	<b>588.5%</b>	<b>17.8%</b>	<b>2 403 553 891</b>
<b>Total of the World</b>	<b>965 926 099 2</b>	<b>30.3%</b>	<b>481.7%</b>	<b>100.0%</b>	<b>6 930 055 154</b>

Source: Internet World Stats 2014.

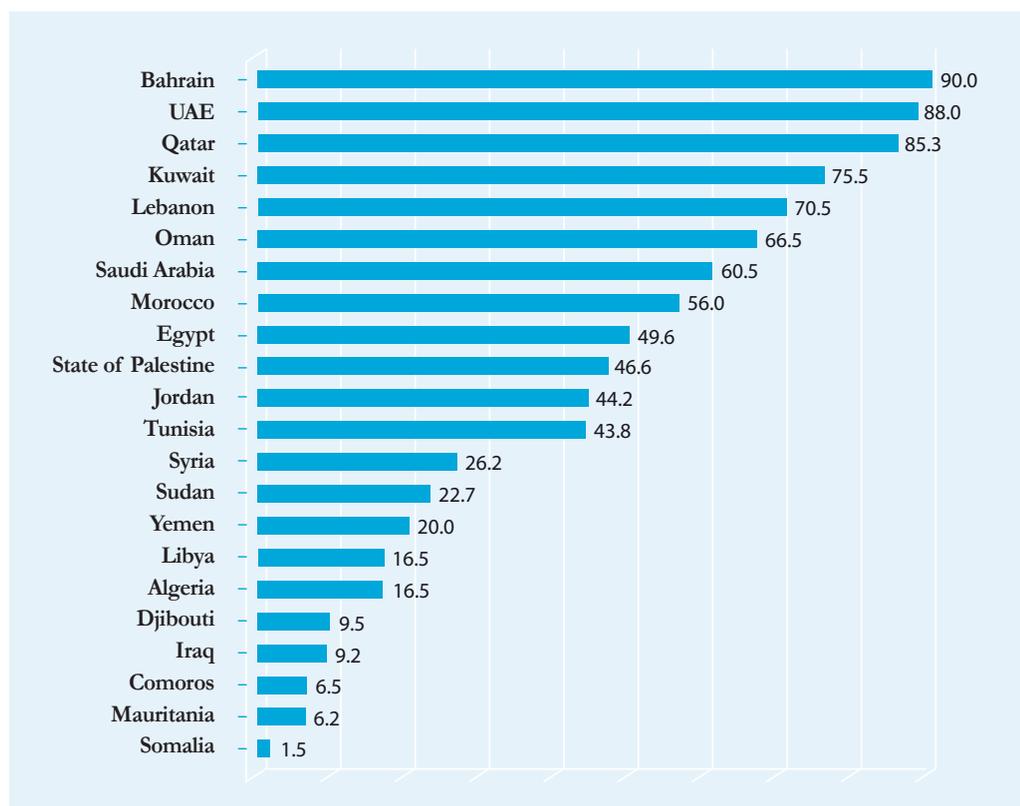
relates to the Arabic language itself, and the second to preparing Arabic content to be processed in-depth.

In order to pave the way for indexing and research in Arabic, texts need to be prepared for meticulous electronic processing. This

The various obstacles preventing the Arabic language from merging into the internet and the digitisation era represent additional threats towards the fragmentation of this language and its isolation from the knowledge society and the progress it brings about

Figure 4.22

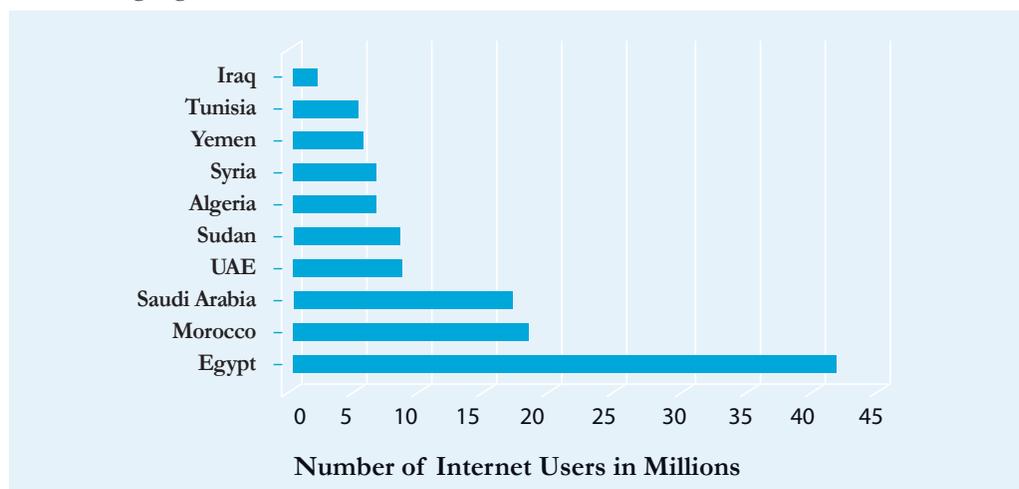
Broadband Penetration in the Arab Countries



Source: ITU Statistics 2014.

Figure 4.23

Number of Internet Users in the Top Ten Arab States in Terms of Using the Arabic Language

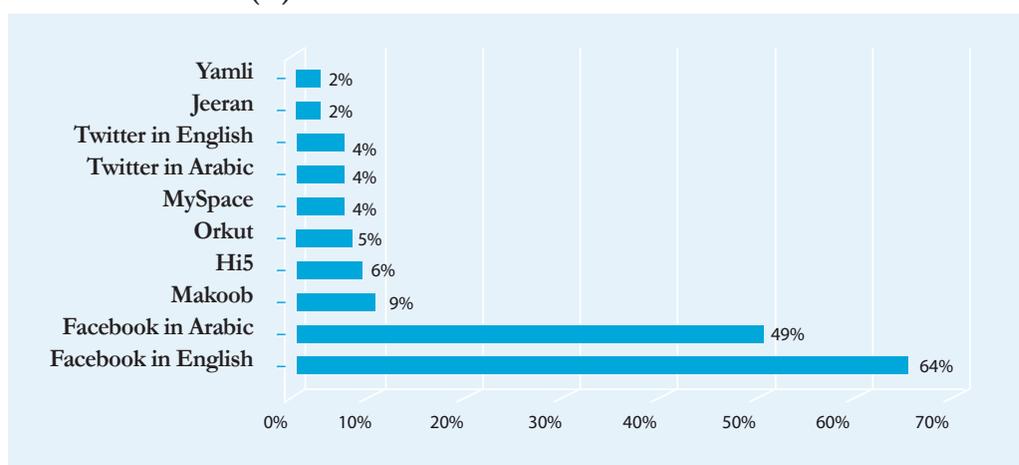


Source: Internet World Stats 2014.

The history of the Arabic language shows that it is flexible

Figure 4.24

Use of Social Media (%)



Source: 2012 ESCWA.

requires developing software that allows for morphological analysis, automatic configuration, and automated analysis of expression. The automated analysis of expression of the Arab sentences is considered a main requirement for the language to be able to catch up with the second generation of language processing applications, which include systems of automated understanding and analysis of the narrative structure of language. Some Arab and foreign businesses are carrying out remarkable activities in this field, yet these efforts and the yielded results are still inadequate.

The various obstacles preventing the Arabic language from merging into the internet and the digitisation era represent additional threats towards the fragmentation of this language and its isolation from the knowledge society and the progress it brings about. As language represents existence per se, such existence has become related to the online presence of a language.<sup>123</sup> The use and presence of the Arabic language in the virtual world are still extremely limited compared to the important value this language should have due to its demographic scale, communication abilities and cultural and aesthetic values.

Table 4.15 classifies the Arabic language among the top ten international languages, based on the number of the speakers and the growth rate of their online presence. The Arabic language ranks 4th among the top ten international languages used online. In 2011, people using the Arabic language online reached 135.6 million<sup>124</sup> compared to 60 million users in 2008.<sup>125</sup> The Arabic language reached the highest growth rate from 2000-2013 where it grew by an average of about 5,296% (see Table 4.15).

Moreover, Figure 4.22 indicates the number of users of the Arabic language on the internet in the top ten Arab countries in 2013. According to this table, Egypt has the highest number of Arabic users (43.5 million), followed by Morocco (18.5 million) and Saudi Arabia (16.5 million).<sup>126</sup>

Today's audio-visual media has helped the knowledge era branch into new creative forms, further enhanced by the growing presence of e-publications. It has also provided new possibilities and capabilities in terms of dealing with subjects by incorporating Arabic and adopting new expressions and syntax-related mechanisms. Reform plays again an important role in maintaining the safe and proper use of such new mechanisms. Reform measures also help ensure that these mechanisms respect grammar and morphology rules, mainly in view of the linguistic weakness in today's virtual world and social media. The history of the Arabic language shows that it is flexible, distancing itself from strict rules which could result in linguistic chaos and misinterpretations. And though some modern interpretations can enrich the language, they can lead to chaos if not dealt with appropriately.

The fundamental question today is, will existing and future technologies lower the status of the Arab identity and Arab civilisation? Or maybe, will such technologies help maintain and consolidate this identity on the human civilisation map? A positive answer to this question depends on the online presence of Arab countries and their

citizens, including future generations. For instance, if Arab universities provide their students with e-educational services, design telecom infrastructures that conform to multimedia applications, while providing all social groups with access to all media, the Arab identity might then succeed in maintaining its existence, achieving tangible results that guarantee communication opportunities, creativity and progress for the future.

## Conclusion

---

The knowledge, creativity and innovation of developed countries are all results achieved through the knowledgeable and highly skilled human capital they have. This human capital is formed and developed through training and educational environments and research centres in the fields of science, technology, creativity and innovation. Such environments are nurtured by active social, political and economic circles that are created through long periods of social development and change. There is another important factor supported by previous knowledge reports related to the empowering environments through which the human capital is prepared and trained to transfer and produce knowledge. These environments, with their many characteristics, can either enhance development or slow it down.

This chapter focused on analysing the enabling environments of integrating the youth in the transfer and localisation of knowledge in the Arab countries. According to the data and analyses related to the various topics discussed earlier (higher education systems, scientific research systems, development pattern in the Arab region), Arab states still need, despite their numerous achievements, to effectively promote enabling environments. They also need to actively motivate and develop such environments in order to support the transfer and localisation of knowledge and effectively engage the youth in such processes. Establishing these environments is the first basic step towards achieving these aspired goals.

---

Arab states still need, despite their numerous achievements, to effectively promote enabling environments

## ENDNOTES

- 1 Wilkins 2011.
- 2 Abu-Orabi 2013.
- 3 Abu-Orabi 2013.
- 4 Abu-Orabi 2013.
- 5 Abu-Orabi 2013.
- 6 Buckner 2011.
- 7 UNESCO 2010a.
- 8 Abu-Orabi 2013.
- 9 Abu-Orabi 2013.
- 10 Buckner 2011.
- 11 UNESCO 2010a.
- 12 For more on the discussion of the issue of establishing university branches outside their country of origin, refer in this context to: Altbach & Salmi 2011; Mazawi 2011; Donn & Monthri 2010.
- 13 Romani 2009.
- 14 Romani 2009.
- 15 Chaaban 2010.
- 16 Chaaban 2010.
- 17 Chaaban 2010.
- 18 Ahmed et al. 2012
- 19 Ahmet et al. 2012
- 20 See Chapter 3 on the economic effectiveness of youth, for more details on the status of youth in the Arab region.
- 21 ESCWA and the League of Arab States 2013. (Reference in Arabic)
- 22 Cabras 2010, and for more data unemployment, refer to Annex 4, table A 4-3.
- 23 UNDP 2011.
- 24 Abdou et al. 2012; Dhillon et al. 2009.
- 25 Ahmad Hajji, background paper for the report.
- 26 Wilkens 2011.
- 27 Wilkens 2011.
- 28 Jaramillo & Melonio 2011.
- 29 See Arab Knowledge Report 2010/2011, UNDP and Mohammed bin Rashid Al Maktoum Foundation 2012.
- 30 Ahmad Hajji, background paper for the report.
- 31 Ahmad Hajji, background paper for the report.
- 32 Regarding the effect of globalisation on the internationalization of universities, skills, and knowledge, and the effect on inducing a global mobilisation of human capitals across the world borders similar to the mobilisation happening in the financial capitals, see Chapter 2, the part related to globalisation.
- 33 World Bank 2012b.
- 34 UNDP 2003. (Reference in Arabic)
- 35 Mohamed et al 2008.
- 36 World Bank 2012b.
- 37 World Bank 2012b.
- 38 NIC's: the Newly Industrialised Countries, refer to the group of countries that are newly industrialised and that are not categorised as developing or developed in terms of income, standards of living, human development and industrialisation. This group includes South Africa, Mexico, China, Malaysia, Brazil, India, Philippines, Thailand, and Turkey.
- 39 Gaillard 2010
- 40 Gaillard 2010.
- 41 Gaillard 2010.
- 42 Arab Knowledge Reports 2009 and 2010/2011, UNDP and Mohammed bin Rashid Al Maktoum Foundation 2009 and 2012. (Reference in Arabic)
- 43 Kishore Mahbubani 2009. (Reference in Arabic)
- 44 See Chapter 2 in differentiating between the explicit and implicit knowledge patterns and the importance of each pattern and its method of transfer.
- 45 Arventis and M'henni 2010.
- 46 UNESCO 2010b.
- 47 Waast 2010.
- 48 KAUST 2010.
- 49 UNESCO 2014a.
- 50 Akoum and Renda 2013.
- 51 UNESCO 2010b.
- 52 UNESCO 2014a.
- 53 UNESCO 2014a.
- 54 UNESCO 2010b and Kamal Najib, background paper for the report.
- 55 King & Pendlebury 2013.
- 56 UNESCO 2010b.
- 57 Gaillard 2010.
- 58 Thomson Reuters 2011.
- 59 Thomson Reuters 2011.
- 60 Thomson Reuters 2011.
- 61 Thomson Reuters 2011.
- 62 Thomson Reuters 2011.
- 63 US Patent and Trademark Office 2014.
- 64 Sen 2004.
- 65 UNDP 2014. (Reference in Arabic)
- 66 UNDP 2014. (Reference in Arabic)
- 67 ESCWA and the League of Arab States 2013. (Reference in Arabic)
- 68 ESCWA and the League of Arab States 2013. (Reference in Arabic)
- 69 ESCWA and the League of Arab States 2013. (Reference in Arabic)
- 70 Arab Monetary Fund 2012. (Reference in Arabic)
- 71 Report Team Calculations based on Human Development Report data 2014 (UNDP 2014). The group includes countries of oil-based economies namely Bahrain, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates and Oman (income data not available for Oman). The group of countries dependent on exports of raw materials includes: Comoros, Mauritania, Sudan, Yemen and Djibouti (income data not available for Djibouti). Countries of mixed economy include: Algeria, Iraq, Libya (income data not available for Libya). Countries with diversified economies include: Egypt, Jordan, Lebanon, Morocco, Syria and Tunisia.
- 72 UNDP 2014. (Reference in Arabic)
- 73 ESCWA and the League of Arab States 2013. (Reference in Arabic)
- 74 ESCWA and the League of Arab States 2013. (Reference in Arabic)
- 75 UNDP 2011.
- 76 UNDP 2011.
- 77 UNDP 2011.
- 78 UNDP 2011.
- 79 UNDP 2011.
- 80 Arab Monetary Fund 2012. (Reference in Arabic)
- 81 UNDP 2011.
- 82 UNDP 2011.
- 83 UNDP 2011.
- 84 Mouhoud 2012.
- 85 Havlik 2012.
- 86 O' Sullivan et al. 2012; Havlik 2012.
- 87 UNDP 2011. (Reference in Arabic)

- <sup>88</sup> The Value Chain includes activities that contribute to adding value to the product that surpasses its cost. The chain stages steps include for instance R&D, product design, and transfer to the consumer market.
- <sup>89</sup> World Economic Forum 2013.
- <sup>90</sup> World Economic Forum 2013.
- <sup>91</sup> World Bank 2014a.
- <sup>92</sup> This part relies on a background paper for the report prepared by Khalid Al Wazani.
- <sup>93</sup> See Chapter 3.
- <sup>94</sup> Khalid Al Wazani, background paper for the report.
- <sup>95</sup> The World Bank & the International Finance Corporation 2014.
- <sup>96</sup> Abdou et al. 2012.
- <sup>97</sup> Khalid Al Wazani, background paper for the report.
- <sup>98</sup> Arab Investment and Export Credit Guarantee Corporation 2011. (Reference in Arabic)
- <sup>99</sup> O’ Sullivan et al. 2012; Havlik 2012.
- <sup>100</sup> The UNDP launched in 2000 the governance programme in Arab countries (Retrieved on August 15. 2014 from: <http://www.pogar.org/arabc>).
- <sup>101</sup> The rate on the scale of governance with its 6 indicators ranges between (-2.5) and (+2.5). 0 indicates the average, while the highest rate indicates the best level on the scale.
- <sup>102</sup> See Kaufman 2011.
- <sup>103</sup> Layla Kabalan, background paper for the report.
- <sup>104</sup> World Bank 2014b.
- <sup>105</sup> Refer to Annex 4, table A 4-18. Source: World Bank 2014b.
- <sup>106</sup> Layla Kabalan, background paper for the report.
- <sup>107</sup> Kaufman 2011.
- <sup>108</sup> Kandil 2009.
- <sup>109</sup> Kandil 2009.
- <sup>110</sup> Mohamed Maliki, background paper for the report.
- <sup>111</sup> Mohamed Maliki, background paper for the report.
- <sup>112</sup> Refer to Annex 4, table A 4-18, source: World Bank 2014b.
- <sup>113</sup> The Networked Readiness Index comprises three components: the environment for Information and Communication Technologies, the readiness of individuals, businesses and governments to use technologies, and the level of this usage. The scale goes from 1 (the worst) to 7 (the best). The countries are considered the best in the world if they register a rate of 5.5-7. Refer to Annex 4, table A 4-12. Source: World Economic Forum 2014.
- <sup>114</sup> Dina Abu El Futouh, background paper for the report.
- <sup>115</sup> International Telecommunication Union (ITU) 2013.
- <sup>116</sup> Refer to Annex 4, table A 4-11. Source: International Telecommunication Union (ITU) 2014.
- <sup>117</sup> United Nations 2014.
- <sup>118</sup> Inaam Bayoud 2010. (Reference in Arabic)
- <sup>119</sup> Habib Srouri 2009. (Reference in Arabic)
- <sup>120</sup> Inaam Bayoud 2013. (Reference in Arabic)
- <sup>121</sup> Inaam Bayoud 2010. (Reference in Arabic)
- <sup>122</sup> Transeuropéennes and the Anna Lindh Euro-Mediterranean Foundation 2012.
- <sup>123</sup> Ibrahim Salah El-Hudhod 2013. (Reference in Arabic)
- <sup>124</sup> Internet World Stats 2014
- <sup>125</sup> Arab Knowledge Report 2009, UNDP and Mohammed bin Rashid Al Maktoum Foundation 2009. (Reference in Arabic)
- <sup>126</sup> Internet World Stats 2014.