

The Moroccan Diaspora and its Contribution to the Development of Innovation in Morocco

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Morocco has always been a crossroads, a place where people are mobile and aware of other cultures. Its location on the borders of three distinctive worlds—the Arab world, North Africa, and Europe—and alongside both the Atlantic Ocean and the Mediterranean Sea has meant that its people can embrace international contact and cultural, economic, and scientific exchange.

Today the mobilization of a highly educated workforce is an important part of international migration strategies. However, the lack of qualified human resources in a globalized and competitive marketplace that requires knowledge and know-how generates new reasons for Morocco's population to be mobile. Indeed, the expertise of Moroccans living abroad can answer specific needs of the nation's emerging sectors.

This chapter aims to describe some of the programmes that have been put in place to assist Moroccans Living Abroad (MLAs) in order to enhance the development of innovation in Morocco. The chapter examines the production of intellectual property, with a focus on patents by the MLA population as a proxy for the development of innovation, and draws some lessons about what

has worked in Morocco that can be applied to other countries at a similar level of development.

The examples given here are presented to demonstrate some approaches that have been successful for Morocco in the hopes that they will prove useful for other developing countries confronting the same issues. These examples are offered in the same spirit of exchange that is found to be so useful and necessary to the successful implementation of innovation strategies.

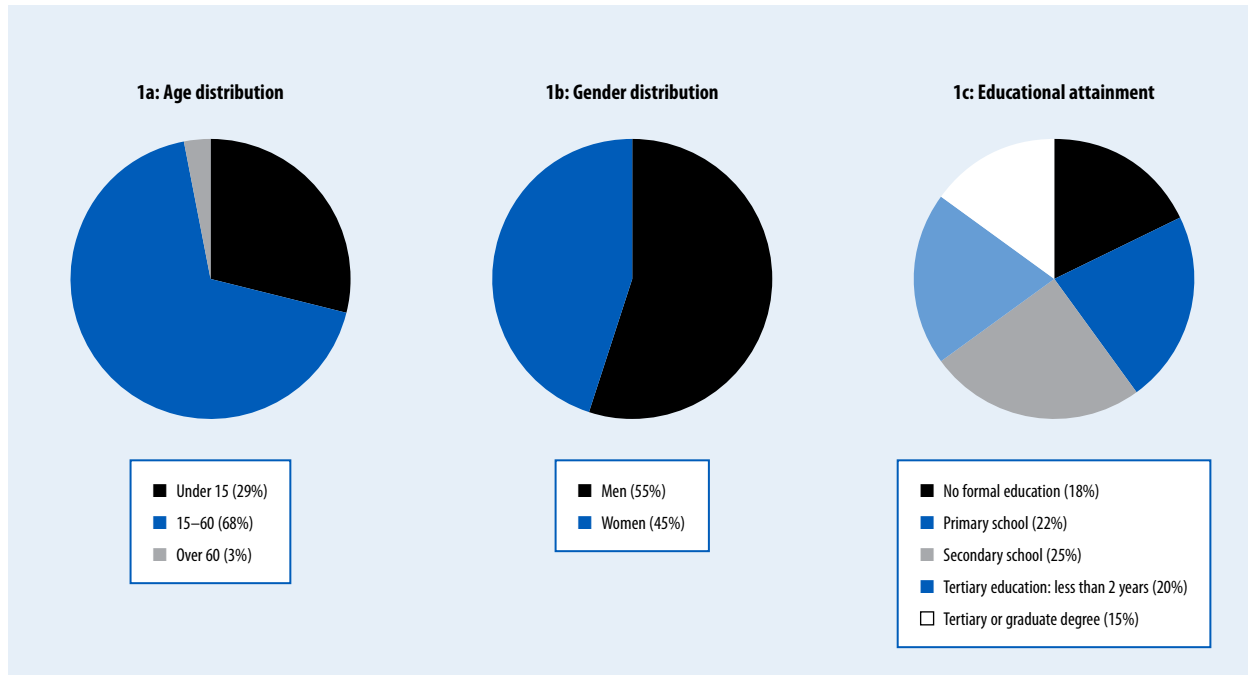
Moroccans throughout the world

In 2012, about 4.5 million Moroccans—15% of its total population—were living abroad. Although this group was originally comprised of men who migrated on their own after World War II, when Europe needed manpower for reconstruction, a recent move towards family reunification has meant that wives have now joined their husbands. The feminization of the group of MLAs has continued, with the migration of single women reflecting the evolving emancipation of women in Moroccan society.

According to a survey conducted in 2005 by the High Commissioner for the Plan, the age pyramid among

MLAs shows a strong predominance of young and working-age people.¹ Men comprise 55% of this group, with women making up 45% (see Figure 1a, 1b). This gender distribution represents the feminization of migration over time. Although these data are from 2005 (no newer data are available), nevertheless they indicate a trend.

Highly skilled Moroccans (those with a tertiary or graduate degree) make up 15% of the Moroccan Diaspora (Figure 1c). This comes to more than 400,000 Moroccans living abroad who have either a bachelor's or graduate degree. The trans-generational socioeconomic ascent of the immigrant population, especially considering the flow of graduates of Moroccan higher education out of the country, is poised to create a high concentration of highly skilled workers among those living abroad. It should be noted that these people consist not only of MLAs who had already received their bachelor's degrees in Morocco when they emigrated, but also includes a generation of their children who were educated in the new country of residence. It is especially noteworthy that the share of persons with a university diploma is twice as high among the MLAs as it is among the domestic Moroccan

Figure 1: Characteristics of Moroccans living abroad, 2005

Source: High Commissioner for the Plan, 2005.

population. It is important to point out here that all programmes put in place in Morocco aim to involve highly educated MLAs in contributing to the development of Moroccan innovation.

More than 32,000 MLAs are senior executives or professionals in the private sector. They are mainly researchers, research and development (R&D) managers, university professors, and business people.

The Moroccan Diaspora is mainly located in France (32%), Spain (20%), Italy (12%), and other European countries, Arab countries (6%), the United States of America (USA) and Canada (together 3%), and some African and Asian countries (Figure 2). It would be useful to look at data about the skill level of the MLAs for each country, but these data are unfortunately not available.

Professionals and the innovative output of the Moroccan Diaspora

Identifying the skilled members of the Diaspora who contribute actively to innovation is extremely difficult because the data are often simply not available. For example, scientific publications do not mention the nationality of the authors, and some authors have more than one nationality.

However, Patent Cooperation Treaty (PCT) patent applications present a unique feature: they specify the place of residence and nationality of applicants. Thus an analysis of patents issued under the PCT enables the identification of patents by inventors who belong to the Moroccan Diaspora, which can serve as a proxy for determining MLA inventors. An analysis of the change to PCT patent applications

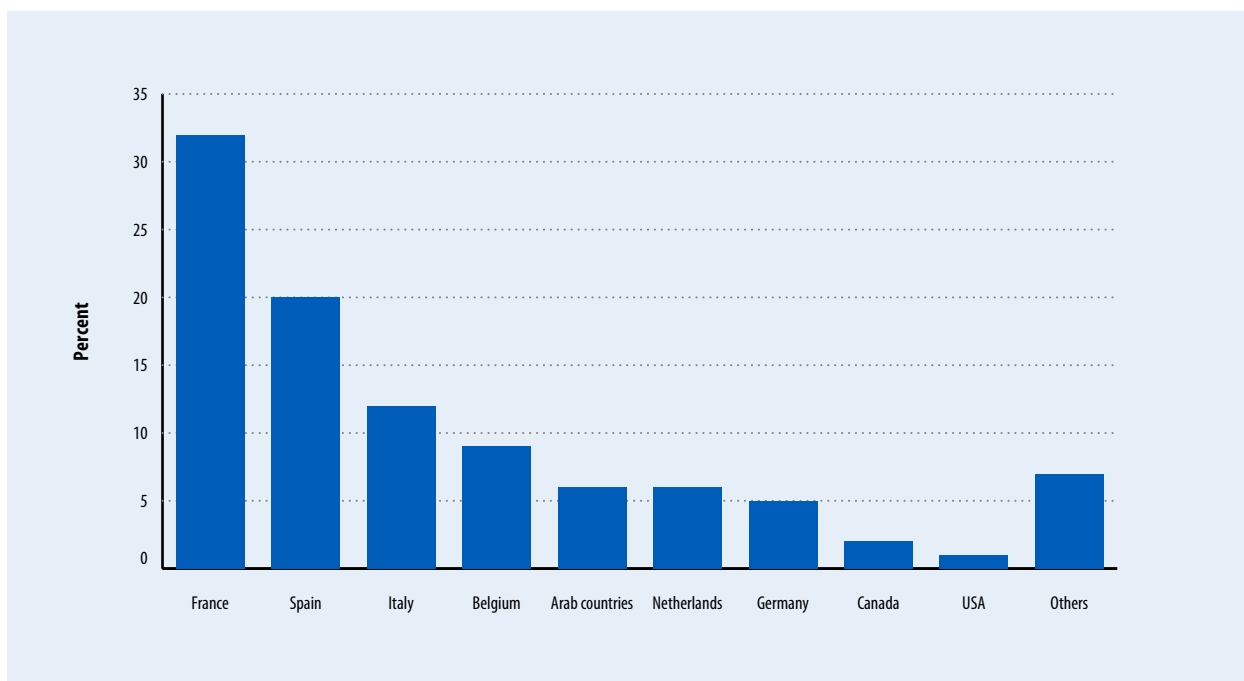
over the years, when considered in conjunction with the change in the numbers of highly skilled MLAs, reveals that the MLAs file more patents, especially in recent years.

According to this analysis, 876 patent applications published under the PCT have been filed by MLA inventors at international locations in the 16 years from 1995 through 2011 (Figure 3).

This large number of Moroccans filing for patents abroad illustrates the important role that research laboratories in developed countries play in stimulating creativity and invention among Moroccan scientists abroad.

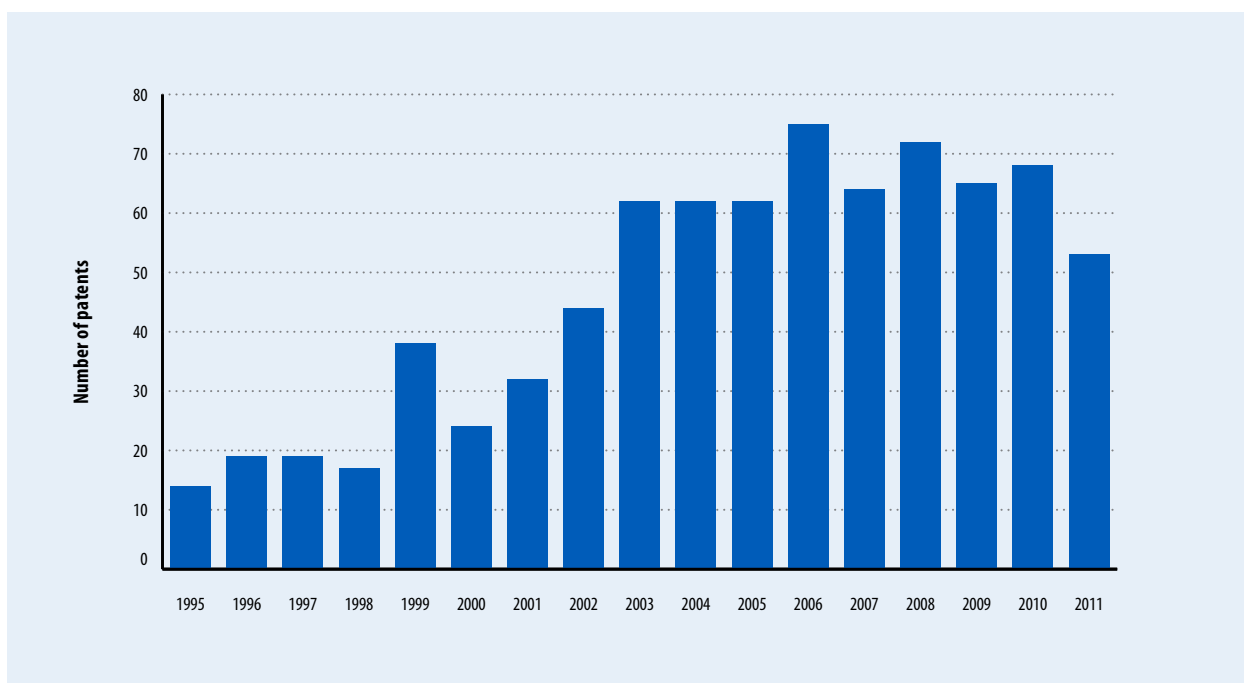
The geographical distribution of the patents of the Moroccan Diaspora shows that they are concentrated in the three countries: France, the USA, and Spain. This finding illustrates the correlation between

Figure 2: Geographic distribution of Moroccans living abroad, 2013

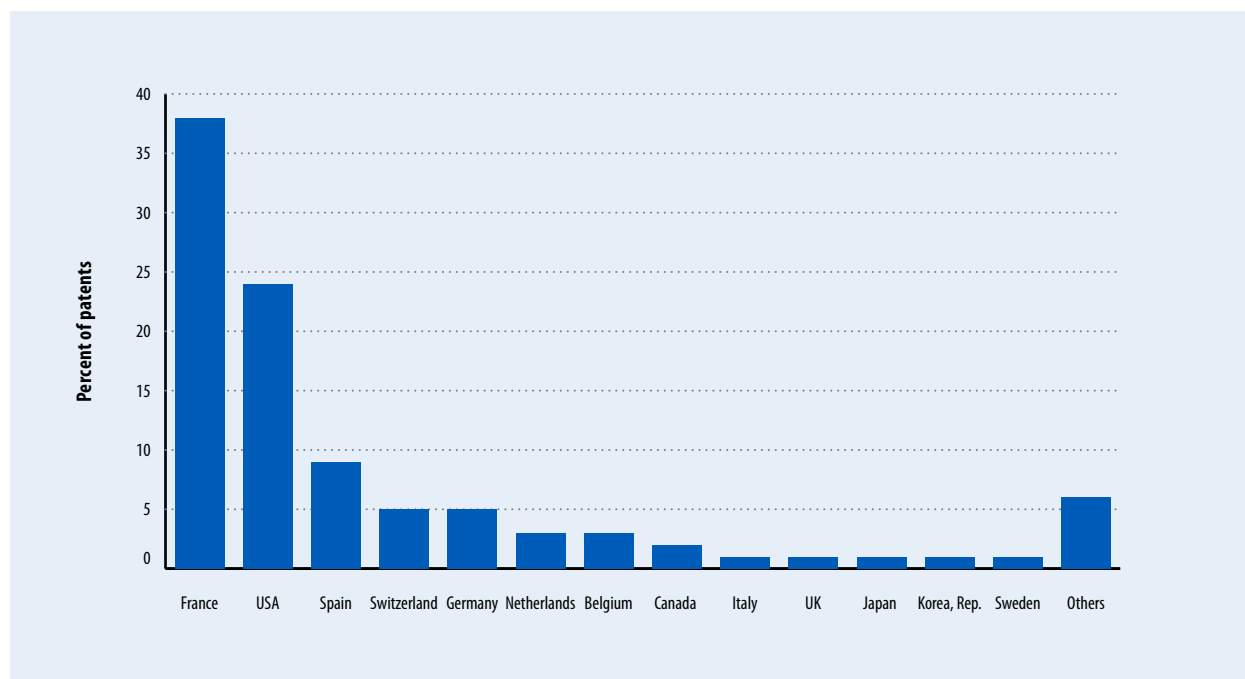


Source: Ministry in Charge of Moroccans Living Abroad and Migration Affairs, 2013a.

Figure 3: PCT patents of inventors of the Moroccan Diaspora, 1995–2011



Source: Patent Scope Database available at <http://www.wipo.int/patentscope/en/>.
Note: It should be noted that, starting in 2012, information on the nationality of the inventors of PCT patents is no longer available through the Patents Scope Database.

Figure 4: Regional mapping of patents of the Moroccan Diaspora

Source: The patent database of the European Patent Office, available at <http://ep.espacenet.com/>

the number of Moroccan students in these countries who became researchers and the number of patent applications they file. Indeed, most Moroccan migrant students settle in the country of their studies.

From Figures 2 and 4, we can conclude that the geographic distribution of MLAs and the geographic distribution of Moroccan patent applications are correlated—see, for example, the data for France and Spain. Note, however, that very few MLAs are living in the USA, but that country has a very high percent of MLA inventors. This is because the innovation ecosystem in the USA is more efficient and flexible.

Data from the Espacenet database of the European Patent Office, which includes patents published in more than 90 countries, shows 778 patents for which one of the inventors is originally from Morocco.²

This research looks only at Moroccan inventors living abroad, not all Moroccan inventors (Figure 4).

A breakdown of the PCT patents of inventors from the Moroccan Diaspora by technical field shows that 20% of the patents belong to medical sciences, followed by organic chemistry with a share of 10% and then biochemistry with 8%.

Moroccan inventors operate in research centres that range from university research laboratories and those of private companies to national scientific research centres. Inventors from the Moroccan Diaspora operate primarily in companies such as France Telecom, Procter & Gamble Company, PHILIPS, Institut Pasteur, and NOVARTIS, among others.³

New research on return migration by the World Intellectual Property Organization shows that

few Moroccan emigrant inventors—only 2.39%—return to their home country to file patents at home.⁴

Two conclusions can be drawn from these data:

1. Moroccan competencies—professional workers, organizations, and academic institutions—abroad contribute to innovation at a global level.
2. MLAs constitute a scientific potential of creativity and innovation for Morocco through mobilization programmes of the Moroccan Diaspora skills.

Mobilizing the Moroccan Diaspora: Strategy and programmes

Aware of the Moroccan Diaspora's role in the development of innovation in Morocco, since the 1990s the government of Morocco has made

major efforts to involve the MLAs directly. These efforts have been focused on both national political strategy and strategy targeted towards MLAs.

Elements of the national strategy

In addition to political measures undertaken to enhance the involvement of MLAs, particularly through specific elements that aim to foster such involvement in the Moroccan Constitution of 2011, actions targeting the Moroccan Diaspora and that aimed to facilitate their mobilization and contribute to the development of Morocco were carried out.

Mobilization strategies

One example of a successful strategy is the programme for the mobilization of highly skilled MLAs called 'Mobilization Program Skills'.⁵ This programme calls upon Moroccan professionals who are ready to contribute with their expertise, experience, and know-how to the development of Morocco. It aims to provide a framework for these professionals that will inform them of opportunities in Morocco and allow them to develop partnerships with Moroccan public and private actors and support professionals abroad who establish projects in Morocco. This strategy is based on the compilation of networks of MLA competencies, the organization of preparatory meetings to inform MLAs about the needs for competencies in sectors that attract them in Morocco, the encouragement of proposals for entrepreneurship and partnership projects by the network that meet the needs of Morocco, the organization of a forum with Moroccan counterparts interested in these projects, and the establishment of partnerships for their implementation.

A second example is a programme called 'MDM invest'. This provides

a mechanism to encourage investors in Moroccan enterprises. It is built around providing three basic possibilities for funding. MDM invest can provide:

- equity (in foreign currency) of at least 25% of the projected amount of the project,
- a state subsidy of 10% of the start-up costs (with a ceiling of 5 million dirhams), and/or
- a bank loan (if necessary) that can reach 65% of the start-up costs.

A third example is the United Nations programme entitled TOKTEN (Transfer of Knowledge through Expatriate Nationals).⁶ Since 1993, Morocco has organized several meetings of the Moroccan Diaspora as part of the TOKTEN programme. TOKTEN aims primarily at mobilizing national professionals living abroad to contribute, through missions and scientific support, for the development of Morocco.

These TOKTEN meetings brought together Moroccan professionals from all backgrounds to discuss the possibilities of mobilization without, however, leading to real programmes and without choosing to move to the institutionalization of a sustainable mechanism in the framework of a national strategy of mobilization of Moroccan professionals living abroad.

Innovation strategy

In June 2009, Morocco created a national innovation strategy entitled 'Innovation Morocco' to build a favourable ecosystem for the development of innovation within Moroccan companies and research organizations. Innovation Morocco was made operational in March 2011.

This strategy consists of four strategic areas:

- Governance and Regulatory Framework,
- Infrastructure and Clusters,
- Funding and Support, and
- Mobilizing Talents.

The first three of these are out of the scope of this chapter, but we consider here the mobilization of talent, which includes members of the worldwide Moroccan community of innovation. In this context, the Moroccan Office for Industrial and Commercial Property, in partnership with the Ministry of Industry, established the Moroccan Innovation club—a virtual platform dedicated to innovation—to network Moroccan innovation actors both in Morocco and abroad. The web platform (available at <http://www.marocinnovation.ma>) was launched during the country's 2nd National Innovation Summit in March 2011. Although the formal evaluation of this programme has not yet taken place, the platform is likely to prove useful to Moroccan innovation worldwide.

The Moroccan Association for Scientific Innovation and Research (MAScIR)

The Ministry of Industry, Trade, Investment and the Digital Economy established the Moroccan Association for Scientific Innovation and Research (MAScIR) Foundation in 2007. The foundation's mission is to promote and develop a centre of innovation and competitiveness based on the needs of the market. MAScIR leads projects that are positioned on technological and application niches with a high added value in the areas of advanced technology such as nanotechnology, biotechnology, and microelectronics.

So far, 17 former MLAs are working in MAScIR in all specialties. They are researchers, PhD students, and experts in other specialties, working as platform directors, centre directors, project managers, researchers, and engineers in a wide range of sectors, including medical and green biotechnology, automotive, chemical industry, electronics, and basic research. The Diaspora comes from many countries to participate in MAScIR, including Belgium, Canada, France, Germany, Saudi Arabia, Spain and the USA. Former MLAs have provided, since its inception, a new dynamic to the expansion of the R&D activities conducted by MAScIR. MLAs have participated in 50% of the 44 patents filed by MAScIR to date. Furthermore, 176 scientific papers have been published by MAScIR since its creation.

The Maghribcom platform

The web platform Maghribcom was inaugurated on 31 January 2013. It provides a place for MLAs to encounter the initiatives and policies of the Ministry in Charge of Moroccans Living Abroad. It offers Moroccan professionals an appropriate information framework in terms of business opportunities, ad hoc collaboration, investment, and employment. Its objective is to serve as a springboard to establish win-win partnerships between economic operators, universities, and research institutions in Morocco on one hand, and Moroccan professionals abroad on the other hand, on a temporary or permanent basis. This platform is accessible at <http://www.maghribcom.gov.ma/>.

By 20 January 2014, almost exactly a year after its launch, the Maghribcom platform had 73 professionals who put their curriculum vitae online to participate

in Moroccan projects and listed 860 competencies offered by MLAs.

The success of this programme depends on all stakeholders committing to total involvement, which includes continued updating and maintaining transparency by so that the suitability of demand and offer can be determined by all parties to these partnerships.

The success enjoyed by Maghribcom in just one year is evidence of Morocco's desire to appoint Moroccan professionals who are currently based abroad to posts within Morocco. To this end, Maghribcom called for the mobilization of efforts and means for the identification and segmentation of skill needs in research, training, expertise, and investment for each sector plans to guide the supply of competencies to satisfy the demands of Moroccan economy's priority sectors.

The FINCOME programme

The FINCOME (Moroccan Forum of International Competences Abroad) programme aims to involve Moroccan professionals residing abroad in supporting the economic, social, and cultural development of Morocco in terms of training, research, expertise, consultancy, or investment initiatives of their own.

FINCOME was implemented by the country's National Centre for Scientific Research (CNRST) and the Association R&D Maroc—a private-sector association of business enterprises established to boost innovation—via open tenders on the platform <http://www.fincome.cnrst.ma/>.

Since FINCOME began, an annual call for proposals for specific activities to be carried on in Morocco for developing innovation is launched by CNRST, thus creating a mechanism and the promise of partial funding to support expert

activities carried on by Moroccan professionals residing abroad, especially in the field of education and research. In 2010, the scope of activities for this programme was enlarged to include the development of new business; this resulted in more activities in this year.

The results of this programme, since its launch in December 2006, are shown in Figure 5.

Since its inception, the FINCOM programme has supported 330 accomplishments (expert consultations, meetings, projects, and new businesses) by mobilizing 384 experts from the Moroccan Diaspora.

Innovative entrepreneurship for Moroccan professionals living abroad

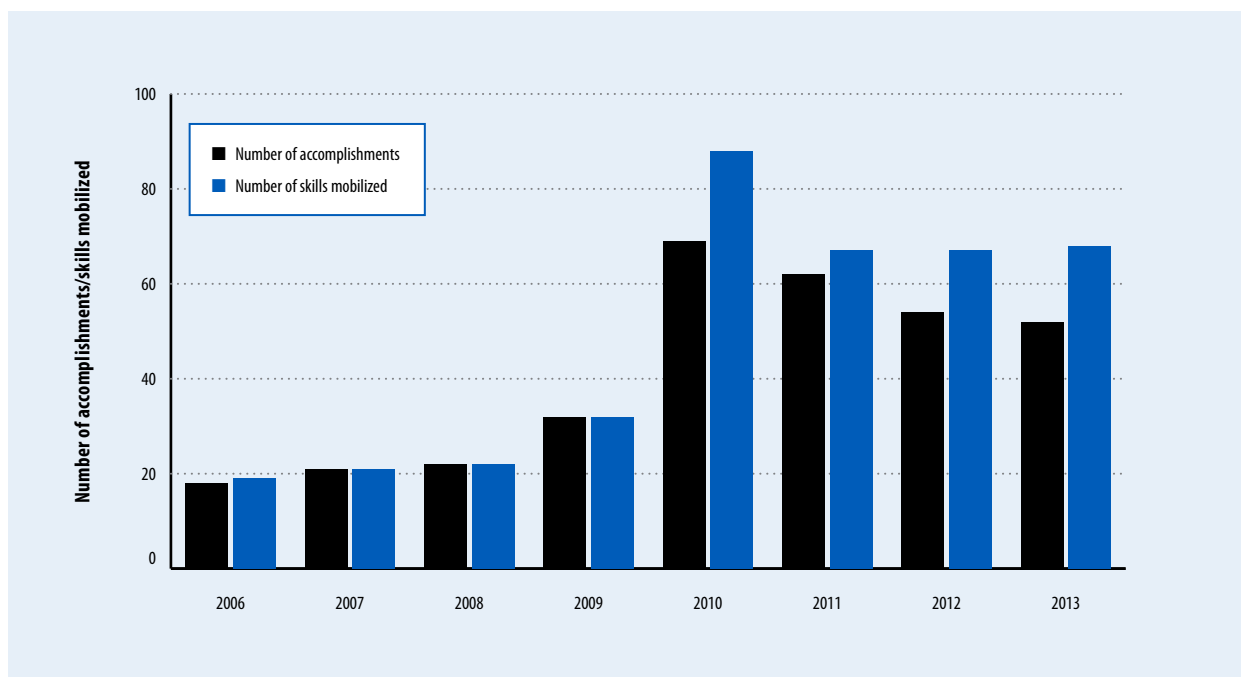
In 2011, the CNRST adopted an innovative business incubator called 'Morocco Incubation' that hosts project developers to create innovative companies from the Moroccan professionals living abroad. The experiment is still in its infancy, and the flow of projects has not yet reached its goal. Cumbersome administrative and financial procedures to which this centre is subject does not make it attractive to the MLAs. Only three projects were accepted in 2011: two of these led to the creation of companies in Morocco, but only one is still active. The other two enterprises have returned to their home countries.

This finding is related to the fact that, despite the considerable efforts of the government and all socio-economic stakeholders, the chain of innovation in Morocco still has missing links that hinder the successful implementation of such projects.

Competencies networks of Moroccans living abroad

The competencies of the Moroccan Diaspora—professionals, organizations, and academic institutions—are

Figure 5: Results of the FINKOM programme



Source: National Centre for Scientific and Technical Research (CNRST), 2013.

organized into networks to coordinate efforts and create synergies in relation to their contributions to the development of Morocco. The following sections provide details about some of these networks.

The Moroccan Competencies Forum (MCF)

Among these networks, the Moroccan Competencies Forum (MCF) aims to increase the involvement of the Moroccan Diaspora in the socioeconomic development of Morocco. These networks exist in Europe, Canada (<http://www.fmcrc.net>), and the USA (<http://www.amc-usa.org>). The stated mission of the American Moroccan Competencies Network, for example, is to 'mobilize and catalyse the engagement of US-based Moroccan professionals, organizations, and academic institutions in the advancement of the

socio-economic development of Morocco and the Moroccan community in the US.⁷ It advances this mission in several ways, including holding conferences for members, among other activities.⁸

DMK Network

Established in 2009, the German-Moroccan network of competencies DMK (Deutsch-Marokkanisches Kompetenznetzwerk) now includes more than 700 German and Moroccan experts working in different disciplines.

The main objectives of this network are to improve relations between the two countries in terms of technology transfer and to facilitate the integration of Moroccans living in Germany.

The DMK network has been involved with several projects. Among them are:

- the establishment of a double degree programme that confers a master in Computer Science from the Technical University of Munich (TUM) and Al Akhawayn University in Ifrane (AUI);
- the establishment of a counselling centre in Frankfurt run by Moroccans living in Germany;⁹ and
- the promotion of the transfer of knowledge in medicine: the network has arranged for medical devices provided by the University of Göttingen to be received by the Faculty of Medicine in Marrakech, and organized a training course on new techniques in the field.

Public-private partnership: The creation of the International University of Rabat

In 2006, after working for more than 20 years in a science career in France, Professor Noureddine Mouaddib mobilized teachers and researchers from the academic and scientific Moroccan Diaspora to create the International University of Rabat (UIR). This project is the first public-private partnership in the field of higher education in Morocco.

The strategic orientation of the UIR—research, development, and innovation (RDI)—consists of the establishment of applied research with a strong, innovative market-oriented component in order to meet the socioeconomic needs of the country. The majority of UIR researchers—30 of them—are derived from the academic and scientific Moroccan Diaspora; they are deeply involved in promoting RDI in the Moroccan scientific environment. Since its creation in 2010, the UIR has recorded more than 100 scientific publications, books, and book chapters and 70 patents applications by its faculty teachers-researchers. In 2013 alone, the UIR filed 47 patent applications, a net increase in that year.¹⁰

Conclusion

The migration of Moroccan professionals to countries abroad began in the late 1990s. MLAs have seen educational achievement and have been elevated to highly qualified competencies, and the more than 400,000 MLAs have seen their contribution to creativity and innovation gain momentum during the last decade.

The efforts on the part of the Moroccan government have fostered a rapprochement with those living abroad. The public opinions of their leaders have strongly encouraged highly qualified individuals to

create projects in Morocco. A study conducted by the European Training Foundation in 2012 revealed a steady return of migrants of working age in the last decade.¹¹ Of those who returned to Morocco, 81% are under 54 years old, and more than two-thirds have their own businesses. The projects of those who have returned to Morocco are in different sectors of the economy, and are often innovative projects that were designed and built out of their experience abroad before being undertaken in Morocco.

Although action has been taken by the government to encourage this development, policies and actions are not yet fully adequate to the needs of the Moroccan economy, which requires a serious boost to its pool of skilled human resources.

The operations carried out and the tools put in place so far are failing because of the relative weakness of their efficiency. A general communication campaign inviting professionals and other competencies to return to their home country may have only a limited effect. It is clear that, apart from the direct action of the FINCOME programme, the different programmes noted above were not much more than announcements.

Because of the lack of monitoring tools, it is difficult to provide updated data and specific indicators regarding the highly skilled Moroccans living abroad. More information about their research and the innovations they have contributed from other countries, as well as more data about the impact of the different actions taken in Morocco towards mobilizing innovative migrants of the Moroccan Diaspora, would provide an opportunity to tailor policy towards specific ends.

In order to compete successfully in the world marketplace for highly

qualified professionals, and to provide for the globalization of markets and business, it is increasingly urgent to make the home country attractive to those who now contribute abroad. This means:

- considering specific return campaigns centred around major technology projects,
- mobilizing these human resources in a targeted manner and earmarking these projects, and
- creating the conditions and environment favourable to the contribution of professionals who are now abroad to further the development of innovation in Morocco.

Morocco has been successful in some ways, but needs to do more to realize the innovative potential of its highly educated workers. As for other developing countries, ensuring that the home country becomes more attractive to these migrants is an important early step. But to do that, more and better data are needed. There is a great need for further research in this area.

Notes

- 1 See the 2005 survey at the High Commission for the Plan, 2005, available at http://www.hcp.ma/Enquete-de-2005-sur-l-insertion-socio-economique-dans-les-pays-d-accueil-des-Marocains-residant-a-l-etranger_a102.html.
- 2 This research was carried out on the patent search engine Espacenet of the European Patent Office, available at [http://worldwide.espacenet.com/searchResults?compact=false&ST=advanced&IN=\[MA\]&locale=en_EP&DB=EPODOC](http://worldwide.espacenet.com/searchResults?compact=false&ST=advanced&IN=[MA]&locale=en_EP&DB=EPODOC).
- 3 Data on organizations that employ MLAs can be found in the Patent Scope Database at http://patentscope.wipo.int/search/fr/result.jsf?query=ana:ma%20-an:%28pct/ma*%29.
- 4 Breschi et al., 2014.

- 5 Details of the programme are available at <http://www.marocainsdumonde.gov.ma/le-minist%C3%A8re/programmes-du-minist%C3%A8re/programme-de-mobilisation-des-comp%C3%A9tences.aspx>.
- 6 Belguendouz, 2010.
- 7 AMCN, no date.
- 8 For an announcement of such a conference, see Lemag: English, 2013.
- 9 For details about the counselling centre, see <http://www.dmk-online.org/>.
- 10 See 'Patents' on the UIR website at <http://www.uir.ac.ma/en/recherche/les-brevets/patents>.
- 11 This study was carried out from a field survey by the European Training Foundation (ETF) with the assistance of AMERM (Moroccan Association for Studies and Research on Migration), and published in March 2013 (EFT, 2013).
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