Final Report Summary - SHEMAERA (Euro-Mediterranean research cooperation on gender and science: SHE Euro-Mediterranean Research Area)

Executive Summary:
All over the world significant advances in women’s education have paralleled a growing concern about the underrepresentation of women in research careers and especially top positions in research. The percentage of women at higher levels of scientific careers is not increasing at the same speed as the number of women with the age and qualifications to reach these levels. This is not only an unfair situation. It is also a waste of talent and a source of bias that neither science nor the economy can afford.

Fifteen years of data-gathering, research and comparative analysis in the European countries has
significantly improved knowledge on gender and science issues and enhanced policy debate and action.

The overall objective of SHEMERA, a project funded by the European Commission under the Science and Society programme of the FP7, was to enhance research cooperation on gender and science between the European Union and the Arab Mediterranean countries: Algeria, Egypt, Jordan, Morocco, Lebanon, Palestine, Syria and Tunisia. The project aimed at increasing knowledge about gender and science issues in these countries allowing for further development of Euro-Mediterranean research cooperation in this field.

The project dealt with gender equality from a twofold perspective: a balanced representation of women in science and the integration of the gender dimension in research content. For the purposes of the project, science was understood in its broadest sense, including the social sciences and humanities as well as research and technological development.

The project research priorities were to better understand the root causes of gender inequality in science in the area and to analyse how the AMCs are addressing these. Socio-economic trends and cultural traditions in the area were taken into account whilst ensuring consistency with existing approaches, methodologies and models at the European level, in order to facilitate future targeted comparison with available data and research from European countries.

The project provided state of the art descriptions, data collection and relevant comparative analysis on gender and science in all the AMCs, focusing on three key themes: statistics on women in science, research on gender inequalities in science careers and gender equality policies in science. These results were made accessible to the research community and policy makers via an online database, publishable reports and workshops. With the overall purpose of enhancing networking and steering policy-making on gender and science in the years to come, the project finally developed recommendations for policy-makers aimed at enhancing the presence of women in scientific research and technological development at all levels and ensuring a better integration of the gender dimension in research policy.

Our work was based on the premise that gender equality in science is not a women’s issue. It concerns and should fully engage men as well as women. We hope the results of our work not only serve to increase knowledge, but also to support and encourage evidence-based policymaking. There is a pressing need for this. Increased awareness and networking around gender and science issues in the Arab Mediterranean countries needs to be channelled into effective policy action.

It is also our firm tenet that gender inequality in science cannot be dissociated from the wider context of gender inequalities in society at large. In a time when prospects for women’s rights are uncertain in many Arab Mediterranean countries, we can only hope that our work, alongside other gender studies, will help to push policy change towards strengthening women’s social, economic and political rights and supporting equal participation in all spheres of life.

Project Context and Objectives:
All over the world significant advances in women’s education have paralleled a growing concern about the underrepresentation of women in research careers and especially top positions in research. The
percentage of women at higher levels of scientific careers is not increasing at the same speed as the number of women with the age and qualifications to reach these levels. This is not only an unfair situation. It is also a waste of talent and a source of bias that neither science nor the economy can afford.

The overall objective of SHEMERA, a project funded by the European Commission under the Science and Society programme of the FP7, was to enhance research cooperation on gender and science between the European Union and the Arab Mediterranean Countries (AMCs): Algeria, Egypt, Jordan, Morocco, Lebanon, Palestine, Syria and Tunisia. The project aimed at increasing knowledge about gender and science issues in the AMCs, allowing for further development of Euro-Mediterranean research cooperation in this field.

RESEARCH ON GENDER AND SCIENCE IN EUROPE

Fifteen years of data-gathering, research and comparative analysis in the European countries has significantly improved knowledge on gender and science issues and enhanced policy debate and action.

In 1996 the European Commission issued the Communication “Incorporating equal opportunities for women and men into all Community policies and activities” (COM (96) 67 final). This was the first step towards the implementation of gender mainstreaming in the European Union. The Amsterdam Treaty of 1997 laid the legal foundation for gender mainstreaming. In 1999 the European Commission issued the Communication “Women and Science: mobilising women to enrich European research” (COM (99) 76 final). This Communication set out an action plan detailing the measures that would be undertaken by the Commission with a view to addressing the question of the under-representation of women in scientific research and technological development and ensuring a better integration of the gender dimension in research policy.

The Helsinki Group of national civil servants was set up in 1998 to enhance the dialogue among the Member States through policy reviews and development of gender indicators in research. The European Technology Assessment Network (ETAN) Expert Working Group on Women and Science was set up in 1999 to identify the challenges to women’s participation in Europe’s scientific and technological development. This led to the publication and wide dissemination of what became known as the “ETAN Report” (Osborn et al. 2000). The core message was that women did not want to be treated as a special case: the concern was that excellence of science in Europe was being compromised by patronage, institutional discrimination and old-fashioned approaches to human resource management.

In parallel, the European Commission launched “She Figures”, a collection of data related to the situation of women in science and research in the European Union. Given that the availability of sex-disaggregated statistics is essential to raise awareness and encourage sound evidence-based policy making in the field of gender and science, the EC’s decision to publish "She Figures" was of utmost importance. In many EU countries, where such data were absent or not publicly disseminated before, the publication of "She Figures" in 2003 finally made it possible to measure the extent of gender imbalances in science and design policies to reduce them. Since then, "She Figures" has been regularly issued every three years to monitor gender equality in the field. This data collection reflects a clear wish to develop pan-European harmonised statistics facilitating cross-national comparisons and to build a base of gender disaggregated data.
available at the EU-level that makes it possible to track changes over time.

EURO-MEDITERRANEAN COOPERATION

The SHEMERA project was carried out within the framework of Euro-Mediterranean cooperation for strengthening the role of women in all spheres of life, considering that the promotion of women in science is a key issue for developing a Euro-Mediterranean Research Area.

The 1995 "Barcelona Declaration" recognised "the key role of women in development" in the Mediterranean region, and the need "to promote their active participation in economic and social life, and in the creation of employment".


The main aim of the SHEMERA project was to support Euro-Mediterranean cooperation in a joint effort to strengthen the role of women in science. During the course of this project, several historical events have shaken up the Middle-East region: the so-called Arab spring, the rise of ultra-conservative Islamist parties, the war in Syria and the intensification of the Palestinian-Israeli conflict with Israel's attacks on Gaza. On the European side, the economic crisis has had a devastating impact on the Southern countries. In spite of this, the SHEMERA project has brought together researchers from universities and research institutes from both sides of the Mediterranean basin who have found ways to enhance research cooperation on gender and science between the European Union and the AMCs.

CONCEPTS, OBJECTIVES AND OVERALL STRATEGY

In the AMCs, developments in data-gathering, research and comparative analysis were scarce before the project started. SHEMERA thus primarily aimed at increasing knowledge about gender and science issues in the AMCs, allowing for further development of Euro-Mediterranean research cooperation in this field.

The project dealt with gender equality from a twofold perspective: a balanced representation of women in science and the integration of the gender dimension in research content. For the purposes of the project, science was understood in its broadest sense, including the social sciences and humanities as well as
research and technological development.

Our research priorities were to better understand the root causes of gender inequality in science in the area and to analyse how the AMCs are addressing these. Socio-economic trends and cultural traditions in the area have been taken into account whilst ensuring consistency with existing approaches, methodologies and models at the European level, in order to facilitate future targeted comparison with available data and research from European countries.

The specific objectives of the project were:

1. To develop state of the art descriptions, data collection and relevant comparative analysis of gender and science in the AMCs, focusing on three key themes:
   - Sex-disaggregated statistics on science;
   - Research on gender inequalities in science careers;
   - Gender equality policies in science.
2. To make the state of the art descriptions, data collection and comparative analysis accessible to the research community, policy makers and society at large in all AMCs via an online database, published reports and workshops.
3. To enhance networking and to steer policy-making on gender and science in the years to come, in particular by developing recommendations for policy makers aimed at enhancing the presence of women in science and ensuring a better integration of the gender dimension in research policy.

[Figure 1: SHEMERA work plan]

The overall strategy of the project is shown in Figure 1. Work package 1 was devoted to the management of the project whilst work package 8 took care of dissemination activities.

The core research work was developed under work packages 2, 3, 4 and 5. Work package 2 established the conceptual and methodological points of departure, taking into account the EU experience in the field of gender and science and the most distinct trends in the situation in the AMCs. The state of the art, data collection and comparative analysis were then carried out in the next three work packages: sex-disaggregated statistics in science (work package 3); gender equality policies (work package 4) and scientific literature on gender inequalities in scientific careers (work package 5).

Activities related to networking and the policy debate were carried out under work package 6. The objective was to enhance awareness and policy debate on gender and science issues in the AMCs, by involving the main players at the national level and promoting Euro-Mediterranean dialogue.

Finally, work package 7 evaluated the results of the previous stages with the aim of drawing the final conclusions and recommendations of the project.

FINAL REMARKS

Our work was based on the premise that gender equality in science is not a women’s issue. It concerns
and should fully engage men as well as women. We hope the results of our work not only serve to increase knowledge, but also to support and encourage evidence-based policymaking. Advances in this field require political will and cooperation between a wide range of actors – namely governments, research institutions and the private sector. There is a pressing need for this. Increased awareness and networking around gender and science issues in the AMCs needs to be channelled into effective policy action.

It is also our firm tenet that gender inequality in science cannot be dissociated from the wider context of gender inequalities in society at large. In spite of progress made in terms of human development in the past decades, socio-economic polarisation and gender inequality are persisting and salient trends in the AMCs. High levels of unemployment and poverty are undermining social cohesion and producing economic and political instability. The progress made regarding women’s access to education and health has not yet been reflected in the spheres of employment and political participation. A wide range of legal, social and economic factors are behind this. Women’s situation is at its worst when gender intersects with other social inequalities - class, religious and ethnic affiliation.

In a time when prospects for women’s rights are uncertain in many AMCs we can only hope that our work, alongside other gender studies, will help to push policy change towards strengthening women’s social, economic and political rights and supporting equal participation in all spheres of life.

Project Results:
1. METHODOLOGICAL APPROACH

1.1 Statistics on women in science

Work package 3 “Statistics: state of the art, data collection and comparative analysis” of the SHEMERA project consisted in compiling harmonised sex-disaggregated data in all the AMCs and in calculating the indicators necessary for monitoring and comparing progress towards gender equality in science in the Mediterranean area.

More precisely, the task was to collect sex-disaggregated data on science, in each AMC, with respect to four subject areas, following the example of "She Figures":
1. Data that make it possible to quantify women’s presence in science (cf. chapter 1 of "She Figures" 2012).
2. Data that illustrate the degree of horizontal segregation or women’s distribution (relative to men’s) across the different fields of science (cf. chapter 2 of "She Figures" 2012).
3. Data relative to vertical segregation or women’s distribution (relative to men’s) across the different hierarchical levels of a typical academic career as well as across the hierarchy of occupational groups in research in the government and business enterprise sectors (cf. chapter 3 of "She Figures" 2012).
4. Data that help assess the level of fairness and success rates for women in scientific fields or women’s influence (relative to men’s) on the setting of the scientific agenda, notably by their presence on boards, their success rates in gathering research funds, and so forth (cf. chapter 4 of "She Figures" 2012).

The compilation of data for the AMCs similar to those published in "She Figures" for the EU should make it possible not just to compare the AMCs among each other but also to contrast the situation of women in
science in the AMCs with the prevailing situation in the EU.

In order to ensure the establishment of common methodological guidelines, a workshop was organised in Brussels on June 20, 2011 and addressed to the national experts in charge of the collection of national data.

Building statistical indicators on women in science for the AMCs is an exercise that is hindered by severe data limitations. Table 1 summarises the data gaps encountered in the SHEMERA project. Cells highlighted in red indicate that there are no data available, cells in green indicate that data exist, cells in orange indicate that partial information is available and finally, cells in grey indicate that these data were not necessary to reproduce the She Figures indicators in the AMCs. The table shows that data on women in academia are more readily available for the AMCs than data on women in research in all broad R&D sectors (Higher Education - HES, the Government sector – GOV, the Business Enterprise sector – BES and the Private Non-Profit sector – PNP).

| Table 1: Data availability in the AMCs |

The analysis of women in research in the AMCs is highly dependent on the existence of R&D surveys similar to the European ones. Unfortunately, an R&D survey exists and is regularly conducted in two AMCs only: Palestine and Syria. Despite the existence of an R&D survey in Palestine, it was impossible for the SHEMERA expert to collect data on private sector research (BES), on the age distribution of researchers, on their involvement in different fields of science or on the number of applicants and beneficiaries of research funding. Moreover, only for Syria is it possible to analyse the situation of women in research over time.

In all other AMCs, the absence of an R&D survey makes the analysis of women in research even more difficult. Nevertheless, despite the absence of an R&D survey in Egypt and Morocco, other data sources in these countries make it possible to do some partial analysis of the situation of female and male researchers although restricted to the higher education sector and government research (although in Egypt the total number of researchers by sex is also available for the BES, this is the only information the expert was able to gather concerning private sector research). Also researchers cannot be distinguished from their colleague technicians and supporting staff as is recommended by the Frascati manual.

In Lebanon, the Ministry of Education publishes the numbers of female and male researchers in higher education but provides no further information. The SHEMERA expert for Lebanon managed to provide additional information on higher education research (male and female researchers by age and field of science) based on a subsample of Lebanese universities that collaborated with the SHEMERA expert to provide the richest data possible. The subsample is comprised of three universities that together represent 48% of the tertiary student population in Lebanon in 2010.

For Algeria, Jordan and Tunisia, no data on R&D personnel and expenditure were collected.

The analysis of women in academia was facilitated by a higher degree of data availability. In the majority of countries it was possible to carry out a thorough analysis of female and male PhD students and
graders and of women’s and men’s presence and advancement on a typical academic career path. The major data shortcomings concern the absence of data on academic wages and on the age distribution of grade A academic staff.

Finally, we were also able to collect sufficient data to investigate the issue of women’s participation in academic decision-making. "She Figures" addresses this issue by means of indicators relative to the share of female heads of institutions in the higher education sector and their representation on scientific decision-making boards. These indicators have been reproduced for the AMCs so that a comparative analysis of this issue was possible between the AMCs and Europe.

1.2 Research on gender inequalities in scientific careers

The objective of WP5 – “Scientific literature: state of the art, data collection and comparative analysis” was to provide an overview and comparative analysis of scientific literature on gender and science in all the AMCs.

The review of scientific literature focused on the following themes:

- Horizontal segregation in science careers: unequal presence of women and men in different scientific fields and institutional R&D sectors.
- Vertical segregation in science careers: the presence of women decreases as one moves up higher in the scientific hierarchy.
- The underlying causes and effects of these two aspects, for instance access to education, work-life balance issues, pay gap, mobility-related obstacles, dual careers, evidence of discrimination, working culture, stereotypes, etc.
- Research on policies for gender equality in science.

Our methodological approach was built on the study "Meta-analysis of gender and science research" (Caprile et al. 2012) launched by the European Commission in 2008. The purpose of the study was to collect and analyse research on horizontal and vertical gender segregation in research careers, addressing the underlying causes and effects of these two types of gender segregation. The study developed the "Gender and Science Database" (GSD), an online database of scientific literature on gender and science (http://meta-analysisofgenderandscienceresearch.org)

In order to share a common understanding of concepts and methodological guidelines, a workshop was organised in Barcelona on May 11 2012, which was addressed to the national experts in charge of collecting and analysing the national bibliography.

A review of the scientific literature has shown that specific research on gender segregation in scientific careers is very scarce in the AMCs, although there is more substantial research on the root causes of gender segregation.

The informed bibliographical database (Gender and Science Database in the Arab Mediterranean countries - MeD-GSD) is available online on the website of the project (www.shemera.eu).
1.3 Gender equality policies in science

The objective of “WP4 Policies: state of the art, data collection and comparative analysis” was to collect and analyse the existing gender equality policies in science in all the AMCs, with the intention of spreading best practice and enhancing policy debate.

The methodological approach was built on European research in this field. In March 2002, the Commission published a report entitled “National Policies on Women and Science in Europe” (Rees 2002). This report provided a complete overview of policies implemented in 30 countries to promote women in science, as well as national statistical profiles for the countries concerned. The report was seen as a practical tool, designed to enable each country to draw from the experiences of others and to adopt measures which had proven successful. In 2008, the study "Benchmarking national policies on women and science" (Ruest-Archambault 2008) updated this report.

In order to share a common understanding of concepts and methodological guidelines, a workshop was organised in Barcelona on May 11 2012, which was addressed to the national experts in charge of the collection of national data. A set of conceptual issues were first discussed. For the purposes of SHEMERA, ‘science’ was understood in its broadest sense, including social sciences and humanities as well as research and technological development. ‘Gender equality in science’ may refer to organisation issues (promoting women’s and men’s balanced presence in science) and/or content issues (mainstreaming sex and gender analysis into basic and applied research). ‘Gender equality policies in science’ refer to any kind of measure, programme or legislation aimed at promoting gender equality in science: It may be a national policy, but also a measure implemented in one single university.

Following Schiebinger (2008) we differentiate between three policy approaches to gender equality in science:
• Supporting women: supporting women’s educational opportunities and careers;
• Promoting institutional change: transforming structures and removing barriers;
• Mainstreaming gender in knowledge production: mainstreaming gender analysis into basic and applied research.

The first of these approaches focuses on programs targeting women themselves with efforts to increase their participation in science. The second approach seeks to increase women’s participation by reforming research institutions. The third focuses on overcoming gender bias by mainstreaming gender analysis into basic and applied research. These three approaches are interrelated: increasing women’s participation in science will not be successful without restructuring institutions and mainstreaming gender analysis into knowledge production.

Research at the national level was based on documentary analysis and interviews. In order to collect and classify gender equality policies in science, legal frameworks as well as various institutions and agencies were researched: scientific bodies, academies, universities and research institutes. Documentary analysis was combined with interviews of key informants: representatives of key institutions and agencies, representatives of women and science associations and gender experts. In our work, we used the questionnaire used in former European reports (Rees 2002; Ruest-Archambault 2008) in order to facilitate
1.4 Networking and policy debate

Enhancing policy debate through networking has been a transversal project activity in parallel to research work. The objective of WP6 “Networking: activities to enhance awareness and policy debate” was to raise awareness and enhance the policy debate on gender and science issues in the Mediterranean area, by involving the main players in each AMC and stimulating Euro-Mediterranean dialogue.

Networking activities started with the establishment of a Task Force on gender and science issues in each AMC. These task forces provided the opportunity to present SHEMERA to relevant stakeholders at the national level and to encourage them to support the development of the project’s activities.

Once the results of the project were available, the SHEMERA partners in collaboration with the members of the task forces organised national workshops in order to discuss the main findings of the project at the national level and discuss the policy recommendations. These national workshops were aimed at institutional policy/decision makers in the field of R&D policies, representatives of the scientific community and R&D organisations and students. Speakers included gender experts as well as ministry and university delegates. The workshops focused on the presentation of the research results and the debate of the policy recommendations for enhancing progress towards gender equality in science at the national level.

These national workshops represented an excellent preliminary work and a good platform to prepare the discussion at the Euro-Mediterranean level. The Euro-Mediterranean Workshop, held at Città della Scienza in Naples on May 30 2014 brought together gender experts and representatives of women/gender-sensitive scientific associations in the European and Arab Mediterranean countries. The presentations, debates, and working group discussions allowed for new insight into the issue of gender and science in the individual countries as well as in the region as a whole.

2. WOMEN IN EMPLOYMENT AND SCIENCE

Over the past four decades, the AMCs have made significant progress in human development. Tunisia, Algeria and Morocco are among the 10 countries recording the world’s fastest progress in human development since 1970 (UNDP 2010). However, socio-economic polarisation is a salient and persisting trend, with high levels of poverty and socio-economic exclusion (El-Baz 2005). The situation in the Arab countries is marked by high chronic unemployment, particularly for adult women and young people of both sexes, whilst the gap in standard of living between the employed and unemployed has widened over the past years (ECSWA 2013). “Even with a better education than their parents, most of the youth today in the region are forced either to compete for limited domestic job opportunities, which are often jobs in the informal sector for which they are highly overqualified, or to emigrate abroad” (ECSWA 2013:v)

During the same period, impressive progress towards gender equality in education and health has been made (World Bank 2013). The average growth rate of key indicators – such as female literacy (+), infant mortality (-), and life expectancy (+) – exceeded that of most other developing regions. The AMCs are close to achieving gender parity in primary and secondary enrolment rates, comparing favourably to low
and middle income countries worldwide, although completion rates are not so favourable. Maternal mortality and fertility rates have declined rapidly over the past decade. Nevertheless, these achievements have not yet translated into a more equal role for women in political and economic life (World Bank 2013; Hausmann et al. 2011).

This gender equality paradox is essential to understand the situation of women in science in the AMCs. Women are better educated than ever before but face major obstacles to entering the labour force on equal terms with men. This trend is also applicable to science. Women are more present than ever in higher education and research, but remain severely underrepresented at the top of scientific careers.

2.1 Data limitations

Building statistical indicators on women in science for the AMCs is an exercise that is hindered by severe data limitations. The analysis of women in research in the AMCs is highly dependent on the existence of R&D surveys similar to the European ones. Unfortunately, an R&D survey exists and is regularly conducted only in two AMCs: Palestine and Syria. LFS surveys are also not systematically carried out in the AMCs, as they are in Europe where not only has each country its LFS survey but also national data are systematically harmonised at the European level.

The data the SHEMERA experts were able to gather from diverse international and national data sources proved sufficient to draw up an interesting picture of how female researchers compare with male researchers in the AMCs but unfortunately they do not allow for a systematic comparison with the whole set of European indicators analysed in "She Figures".

2.2 Women in research

Overall, the share of researchers in the labour force is very small in Europe (0.99%) and even smaller in the AMCs. Only in Lebanon (1.13%) is this share larger than (on average) in Europe.

The scarce statistics available to map research and the research population show that the proportion of women is quite comparable in the AMCs and the EU. "She Figures" 2012 provides a clear pattern of female under-representation in research in the European Union. The average proportion of female researchers in the EU27 stood at 33% in 2009 but wide variations were noted between countries: whereas Luxembourg, Germany and the Netherlands respectively had just 21%, 25% and 26% of female researchers, at the top of the country ranking according to the proportion of women in research were two Baltic States, Latvia and Lithuania, with more women than men in research, but also Bulgaria, Portugal, Romania, Estonia, Slovakia, and Poland, all of which had at least 40% of women in their research population. A similar pattern of female underrepresentation in research is also observed in the AMCs. Figure 2 presents the proportions of women in research in the AMCs for which data are available. Compared with the European situation where one in three researchers is a woman, the proportion of female researchers is lower in Jordan, Palestine and Morocco where it stood at 22%, 25% and 32% respectively in 2010. The share of female researchers is slightly higher than in the EU on average in Syria and Lebanon where it stood at 37% and also in Egypt, the country with the largest share of women in the research population (39%).
As in Europe, the presence of women in research is the lowest in the private sector and the highest in the government and higher education sectors. Patterns of horizontal segregation are present, although they are less marked in the AMCs than in Europe.

2.3 Women in academia

In the AMCs female enrolment rates in higher education come close or, as in EU countries, surpass male rates, although enrolment rates for both women and men are lower in the AMCs. The Gross Enrolment Ratio (GER) is a statistical measure used to determine the number of students enrolled in school at different grade levels. It measures the ratio of the number of students who live in a country to those who qualify for a particular grade level. The United Nations Educational, Scientific and Cultural Organization (UNESCO) describes the 'Gross Enrolment Ratio' as the total enrolment within a country "in a specific level of education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education." The GER is thus obtained by dividing the number of individuals who are actually enrolled in schools by the number of individuals who are of the corresponding school enrolment age. The Gross Tertiary Education Enrolment Ratio considers the number of young people in the five-year age group following the secondary school leaving age, which is usually 18. The gross enrolment ratio can be greater than 100% as a result of grade repetition and entry at ages younger or older than the typical age at that grade level.

Figure 3 presents the 2008 tertiary gross enrolment rate of women and men in the AMCs, the EU and North America. First, it shows that in the AMCs, both for women and men, the enrolment rate in higher education is lower than in the European Union and North America. Whereas for women the rate is close to 100% in North America and to 70% in the EU, it is below 60% in the AMCs. Of the AMCs, Palestine is the country with the highest enrolment rates of men and women in higher education, followed by Lebanon and Jordan. The rates are lowest in Morocco. A second finding is that, as in the EU and North America, women's tertiary enrolment exceeds men's in 4 of the 7 AMCs for which data are available. In Egypt, Syria and Morocco, the male rate remains slightly higher than the female rate.

[Figure 3: Tertiary gross enrolment rate by sex, 2008]

In 2010, in the EU27, 46% of all PhD graduates were women. From representing a majority among the student population in higher education women have thus lost ground, because at the level of the PhD their share has dropped below 50%. Within the EU27, the country where the share of female PhD graduates is lowest is Malta with 25% whereas in Portugal women represent 62% of all PhD graduates. A similar situation is found in the AMCs - as shown in Figure 4. The share of women among PhD graduates varied between 33% in Syria and 56% in Tunisia in 2010. The share of 10% of women in Palestine refers to PhD holders rather than PhD graduates. The figure is not entirely comparable with the other countries. Data on PhD graduates are non-existent for Palestine as there is only one local university accredited to deliver a PhD degree in just one field of science, chemistry. Therefore, for Palestine, the figure shows the proportion of women among PhD holders (stock) instead of graduates (flow). The country where the share of female
PhD graduates is highest, Tunisia, is closely followed by Lebanon where women represent 52% of all PhD graduates. In these two countries women thus continue to outnumber men at the entrance to the academic career. In the remaining AMCs the share of female PhD graduates ranges from 33% to 39%. More precisely, their share stood at 33% in Syria, 35% in Jordan, 36% in Morocco, and 39% in Egypt.

[Figure 4: Proportions of female PhD grantees (ISCED6), 2010]

The distribution of women and men across scientific fields shows a high level of horizontal segregation in the AMCs, even though this type of segregation remains a less salient problem than in EU countries. Table 2 shows that in 2010, on average throughout the EU27, women accounted for 64% of all PhD graduates in education, 56% in health and welfare and 54% in the humanities and arts. A more or less balanced gender composition is observed only in the social sciences, business and law, with 49% of women, and in agricultural and veterinary sciences, with 52% of women. On the other hand, the fields of science, mathematics and computing and especially of engineering, manufacturing and construction are characterised by a strong gender imbalance. In the former, women constitute just 40% of PhD graduates and in the latter their share drops even lower to 26%. In 2010 science and engineering thus remained very male-dominated scientific fields in the EU27.

Regarding the AMCs, the bold and italic figures in Table 2 indicate that these proportions were computed on a total number of PhD graduates below 50. These figures should thus be interpreted with caution as they rely on small samples. Table 2 nevertheless shows that there is no feminisation of the field of education as in European countries. Only in Lebanon are 50% of PhD graduates in education women but this figure may be biased due to small samples. Egypt comes close with 46% of female PhD graduates in this field. However, in the remaining AMCs women are a minority among PhD graduates in education.

We also note that the humanities and arts are not feminised to the same extent in the AMCs; only in Lebanon is the share of female PhD graduates as high as 60% (and again the figure should be interpreted with caution due to sample sizes) but in the other AMCs women represent at most 41% of PhD graduates in this field.

The social sciences, business and law are a feminised field of study only in Tunisia and Lebanon (small sample!).

PhD graduates are small in number in the field of health and welfare in Syria, Tunisia and Jordan. In the other AMCs the feminisation of this field which we generally note in the EU27 is not observed. In Morocco the situation is close to equality, with 49% of female PhD graduates, but in Lebanon, Egypt and particularly Palestine women form a minority among PhD graduates in this field.

However, it is striking to see that women dominate in the field of science, mathematics and computing in Egypt and Tunisia and that there is a gender balance in this field in Lebanon (although this figure may be biased due to small samples).

In engineering, mathematics and computing, apart from Jordan, where there is a sample size factor, in the other AMCs the situation of women’s under-representation is less pronounced than in the EU27. The only
exception is Palestine where women represent just 5% of all PhD graduates in engineering. The patterns of gender segregation across fields of study that we note in the EU27 are thus less marked in the AMCs.

Table 2: Proportion of female PhD (ISCED 6) graduates by broad field of study, 2010

Table 3 shows the proportions of female academic staff by grade. In both Europe and the AMCs, women in academia are underrepresented at the top of the academic ladder. In the EU, the proportion of women among academics at the highest grade (Grade A) stands at 20% on average. The two EU Member States where the share of women among grade A academic staff is the highest (above 30%) are Romania and Latvia. In contrast, the proportion of women was the lowest in Luxembourg, Cyprus, Belgium and the Netherlands. Their proportions ranged from 9% in Luxembourg to 36% in Romania. In the AMCs, female representation at grade A ranges between 3% in Palestine and 35% in Egypt. In Jordan and Syria the share of female grade A academics is also very low and in Lebanon, Algeria and Morocco it is around one fifth. The proportion of female academic staff at grade A is thus much higher in Egypt than in the other countries. Comparisons in this field have to take into account that the exclusivity, status and prestige associated with grade A differ significantly across the AMCs. However, even in those countries where female representation at grade A is comparatively high, as in Egypt, the presence of women is always greater at the lower levels of the academic career.

Table 3: Proportion of female academic staff by grade and total, 2010

2.4 Women in academic careers: national data

Figure 5 shows the scissors diagrams for the 8 AMCs. There is great variation in nationally applied classifications of academic grades throughout the AMCs so that comparison of scissors diagrams across countries is a very delicate exercise.

Figure 5: Proportions of men and women in a typical academic career, students and academic staff, 2004/2010

Just as in the EU27, at the first two levels of university education, women either outnumber men or their share is at least as high as that of men in the AMCs, with the exception of Syria (where female students represent roughly 40% only) and Morocco (where the shares of female and male students are roughly equal).

At the third level showing the gender distribution among PhD students, the proportion of female students drops back noticeably in all countries so that men come to outnumber women at this level. The only exceptions are Tunisia, where there is a slight increase in the share of women between the level of Master graduates and that of PhD students so that women continue to represent roughly 60% of all PhD students, and Syria where women are roughly 40% at the first two levels of university education, a share that remains stable at the level of PhD students.

Among PhD graduates, the gender gap narrows again, except for Syria. The share of female PhD graduates is very close to that of men in Egypt, Lebanon and Tunisia.
As the PhD degree is often required to embark on an academic career, in some countries, the catching up of women with men among PhD graduates is reflected in high shares of women at the early stages of the academic career (e.g. Lebanon and Tunisia) whereas in others the high share of female PhD graduates does not translate into the early stages of the academic career as a reduction of women’s numbers starts straight after the PhD level (Palestine and Morocco but also Egypt, Syria and Algeria). The take-off phase in the academic career is more hazardous for women in the latter countries.

After the start of the academic career, except for Egypt and Algeria, a general finding is observed in all countries: that of a widening gender gap because of ever smaller shares of women as we move up the grades. As in the EU27, this illustrates the workings of a sticky floor. The proportion of women is the smallest at the top of the academic hierarchy, falling back to almost 0% of grade A academic staff in Palestine and Jordan, to around 10% in Syria and Tunisia, and to around 20% in Lebanon, Morocco and Algeria. These figures clearly indicate the existence of a glass ceiling. One of the obstacles is certainly women’s lesser likelihood to have well-developed social networks; they tend to be in a weaker position to employ wasta, or personal connections, to advance professionally (UNDP 2013). Egypt stands out from the other countries with a percentage of 35% of women among grade A academic staff, a fact that should again be interpreted in light of the lesser exclusivity of this grade in the Egyptian academic system (48% of all female and 60% of all male academic staff hold grade A).

A comparison between 2004 and 2010 shows an improvement in women’s relative position at the PhD level and at the different stages of the academic career, as shown in grades A, B and C. As in the EU27, this positive progress is very slow so that policies are needed to speed up the progress towards more gender equality in academia in the AMCs. The very negative evolution for women at grade A level in Syria between 2004 and 2010 is to be attributed to the adoption during this period of the aforementioned law that severely complicates access to grade A positions, penalising particularly female academics in Syria.

Although a picture of vertical segregation emerges through the analysis of the scissors diagrams for the AMCs, the situation varies considerably according to the country considered and comparisons between countries are made very difficult because of the country-specific structuring of the academic career.

2.4 Women in scientific decision-making positions

Figure 6 presents the proportion of female heads of higher education institutions. On average throughout the EU27, 15.5% of institutions in the Higher Education Sector are headed by women. This proportion varies between 27% in Sweden and 6.5% in France. Whereas the average proportion of women among grade A academics stood at 20% in the EU-27 in 2010, just 15.5% of higher education institutions were headed by women. The more we advance along the academic ladder, the fewer women we find.

Is the image of the leaky pipeline also confirmed in the AMCs? In Jordan, Syria, Lebanon and Algeria, only about 4-5% of institutions in the higher education sector are headed by women. This proportion rises to 10-11% in Tunisia and Egypt. As for the EU27, it is interesting to compare these figures with the proportions of women among grade A academic staff as analysed previously in this section. Whereas the average proportion of women among grade A academics ranged between 3% in Palestine and 35% in
Egypt, just between 4% and 11% of institutions in the higher education sector are headed by women in 2010. The image of the leaky pipeline is thus felt also in the AMCs. Jordan and Syria both have some of the smallest shares of female grade A staff and of higher education institutions headed by women. Lebanon and Algeria have relatively more female grade A academics (respectively 23% and 17%) but still only few female heads of higher education institutions. Tunisia, on the other hand, has a small share of female grade A professors but relatively many female-headed institutions in higher education. Finally, Egypt presents a high-high scenario, the proportion of female grade A academics is very high at 35% and 11% of all higher education institutions have a female head.

Figure 6: Proportion of female heads of institutions in the Higher Education Sector (HES), 2010

A second indicator can be usefully added to this overall pattern, although it is not restricted to higher education but also covers research and scientific activities in other sectors: the proportion of women on boards. The coverage of boards shows considerable cross-country variation. Table 4 lists the boards and councils considered in each of the AMCs.

Figure 7 illustrates to what extent women are involved in top decision-making committees that have a crucial impact on the orientation of research. On average in the EU-27, 36% of board members were women in 2010. In the EU27, the most important institutions in the scientific landscape thus continue to be dominantly led and managed by men. When boards have such an unbalanced composition, a gender bias, mostly very subtle and largely unconscious, is likely to influence the decisions that are made (Meulders et al. 2010). In view of this, She Figures 2012 refers to the fiercely debated question of the usefulness of fixing quotas in order to reach a critical mass of women in scientific decision-making. In the Nordic countries, where such quotas exist, the share of female board members approaches equality (respectively 49%, 46% and 45% in Sweden, Norway and Finland).

Compared with an average 36% of female board members in the EU27, only between 6% and 23% of board members are women in the AMCs. In other words, less than a quarter of all board members are women. Lebanon stands out from the other AMCs with 23% of female board members.

Figure 7: Proportion of women on boards, 2010

To sum up, women’s under-representation at the highest hierarchical levels of the academic career severely hampers their chances of being at the head of universities or similar institutions in higher education. As noted in "She Figures" 2012, the small proportion of women at the head of institutions in the higher education sector or in decision-making committees has various consequences. On the one hand, it makes it very difficult for young women in academia to find female role models, and thus to identify with the highest levels of academic life. On the other hand, from a gender point of view, the weak presence of women in high-power positions, and the male dominance that results from this, bias (often unconsciously) decisions that are taken at these high levels and that shape scientific policies, determine the choice of research subjects, orient research credits and fix nominating rules and criteria. What could be called a discriminatory snowball effect is thus revealed: women’s under-representation at the highest echelons is an obstacle for the access of young women to the PhD level and the first stages of the academic career.
Gender segregation in employment is a persistent trend in Europe. There is no evidence of any spontaneous movement towards a reduction in gender employment segregation in European countries. On the contrary, the evolution of labour markets over the last 20 years points towards unchanging, if not rising levels of segregation, although with significant variation across countries and divergent desegregation and re-segregation tendencies (Bettio and Verashchagina 2009).

In the AMCs, gender segregation in employment is also a pervasive trend and appears to be more pronounced than in Europe. According to the UN Arab Development Report “women do not enjoy equality with men in job opportunities, conditions or wages let alone in promotion to decision-making positions” (UNDP 2006:8). Women’s participation rate in labour forces in the MENA region is the lowest in the world, although it is widely acknowledged that standard statistics do not reflect the high share of women in informal activities, i.e. family workers in agriculture and informal service jobs. For women with low education levels, segregation encompasses very low rates of female participation in the formal labour market with employment concentrated in low paid occupations and informal activities. Participation rates are far higher for well educated women, but so are unemployment rates, namely for young women. In turn, employment tends to be concentrated in a narrow set of jobs, namely on the lower rungs of the ladder of certain occupations (health, education) in the public sector (UNDP 2006; World Bank 2013).

3.1 Root causes of gender segregation in employment

In Europe, gender segregation in employment persists in spite of significant changes over recent decades: impressive advances of women in education, the reduced importance of physical attributes for productivity, the enforcement of equality legislation, changes in family roles and the stance taken by feminism in defiance of traditional gender norms. In order to explain the persistence of gender segregation, research focuses on four sets of factors: gender stereotypes, choice of study field, gender division of labour and time constraints and covert barriers and biases in organisational practices. In spite of legal equality, subtle discrimination against women persists (Bettio and Verashchagina 2009).

Our analysis shows that these factors are also relevant in the AMCs, obviously coupled with others more directly related to the specificity of the political, social and economic context. Overt legal restrictions combine with traditional gender norms and covert discriminatory practices, education disparities are more relevant as the progress of women in education is still recent, and women’s employment opportunities appear to be disproportionately hindered by slow economic growth and the contraction of the public sector.

Research has paid special attention to the very low level of women’s labour force participation, a major challenge facing all AM countries. Traditional gender norms are probably one of the most important causes, although it is acknowledged that there is no single factor behind this pattern but rather a complex set of economic, social and legal determinants.

3.1.1 Legal constraints

“Laws concerning labour and personal status are considered to be among the most daunting obstacles to
Arab women’s participation in economic life” (UNDP 2006: 92). All AMCs have constitutional clauses that set out the equality of citizens and all have ratified international conventions that affirm gender equality, namely the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW). Nevertheless, they all maintain reservations to CEDAW and there are laws that differentiate between the sexes in all the AMCs.

The main reason behind the reservations to CEDAW is the conflict with Family Codes. Family codes in most AMCs do not comply with CEDAW provisions in terms of equality in marriage and family life (article 16). According to the CEDAW committee, Tunisia is the country which has shown the firmest determination in achieving gender equality and aligning its legislative framework with international standards. Indeed, the Tunisian Council of Ministers adopted in 2014 a draft decree to withdraw all reservations to the CEDAW. Nevertheless, the CEDAW committee has indicated that gender-discriminatory laws do persist in all AMCs, including Tunisia. Discriminatory provisions are mostly found in family and penal legislation, although the CEDAW committee also highlights problems in the labour codes. Among the most salient factors, it should be noted that the principle of equal remuneration for women and men for work of equal value is not fully incorporated in Egypt and Jordan; regulation of sexual harassment in the workplace is absent or only partially incorporated in several countries; and informal workers (domestic, agricultural, family workers), mostly women, are excluded from the protection of the labour codes in most countries.

Research in the AMCs focuses not only on the extent of legal constraints to women’s participation in public life, but also the problem of enforcing laws when they are aligned to international conventions. A substantial strand of the literature highlights that the existence of fair legislation for women in not enough to achieve equality, since the gap between legislation and practice is wide.

3.1.2 Gender norms and division of labour

“The prevailing masculine culture and values see women as dependants of men. As a result, men take priority both in access to work and the enjoyment of its returns. This tendency ignores the role of women in contributing to family income or in supporting entire families, a phenomenon that is on the rise in all societies, including Arab societies” (UNDP 2006: 91). In all the AMCs, the persistence of patriarchal attitudes and strong stereotypes about the roles and responsibilities of women and men in family and society is widely acknowledged as a root cause of gender discrimination. According to the CEDAW committee, this applies to all AMCs, although to varying degrees. Gender norms tend to be in line with the traditional male breadwinner model which confines women to the home and limits access to economic and political power to men (Moghadam 2004, Offenhauer 2005). Traditional gender norms are also present in the EU and other Western countries, but they appear to be more pronounced in the AMCs (World Bank 2013).

The literature usually acknowledges that gender stereotypes and the predominance of patriarchal values and traditions are deep-rooted obstacles for women’s empowerment. A major concern is to ascertain whether traditional gender norms are being devaluated among young people. With regard to the gender division of labour, there is clear evidence that women in the AMCs, as in other countries, typically bear a disproportionate share of unpaid household work. Research stresses that work-life balance is considered
as a women’s issue whilst public policies and employers’ practices do not provide adequate support for the reconciliation of work and family life. Maternity leave provisions vary greatly across the AMCs, but paternity leave is generally absent. Another common problem is the lack of adequate care services for children and dependent adults.

3.1.3 Education disparities

In recent decades the AMCs have made impressive advances towards gender equality in education, but gender disparities in education remain a major cause of segregation in the labour market. Advances in education are still recent in many AMCs. The area is close to achieving gender parity in primary and secondary enrolment rates, but there are disparities in completion rates. The level of education of adult women is still far lower than men’s, whilst illiteracy rates are higher (World Bank 2013).

Research provides evidence that girls from poor families in rural areas face greater obstacles to attending primary and secondary school, highlighting how gender disparities intersect with class and urban/rural divides. The literature also points out that the improvement in female enrolment and completion rates, though necessary, does not automatically lead to equality in educational outcomes. The persistence of a hidden curriculum in education is a major concern. Gender disparities in education are also evident in horizontal segregation, which is a salient trend in all AMCs. The lack of diversification in women’s training and education is one of the factors that explains their disadvantage on the labour market by comparison with men. Overall, women tend to pursue studies which are less valued than those pursued by men, a fact that restricts women’s employment prospects (UNDP 2006). This applies to vocational education and the choice of study field in post-secondary and tertiary education.

3.1.4 Scarcity of jobs and inadequate working conditions

The scarcity of jobs is a major cause of gender segregation in employment. “Slow growth in the region predisposes economies towards low demand for female labour” (UNDP 2006: 8). Overall, slow economic development does not provide the jobs needed to absorb increases in the labour force, whether in the number of men or women. Nevertheless, the scarcity of jobs has a greater impact on women’s employment. One of the main sources of female employment in the AMCs is the public sector, which is suffering a contraction due to privatisation policies and the reduction of public expenditure. A decrease of jobs due to a loss of competitiveness in European markets is also apparent in the manufacturing industry, which is another major source of female employment, notably in the textile and clothing industries in Morocco and Tunisia.

Women’s employment opportunities appear to be seriously hindered by the contraction of the public sector combined with inadequate working conditions in the private sector (UNDP 2006). Research highlights that well-educated women have traditionally looked for employment in the public sector because it offers better working conditions in terms of wages, job security and work and family balance. However, young women find it more and more difficult to find such a job under current structural adjustment policies (Gadallah 2011; World Bank 2013). In contrast, working conditions in the private sector appear to be especially hostile to women. A recent conference on women’s employment in the private sector in the MENA countries (Swedish Institute Alexandria 2014) highlights the pervasiveness of gender discriminatory
practices affecting wages, with women earning less than men for work of equal value. A second major concern is the lack of adequate human management policies to support the reconciliation of work and family responsibilities. When maternity protection is enforced, it can be a double-edged sword, acting as a barrier to the recruitment of women. Finally, sexual harassment is also a key barrier to working in the private sector, occurring both within the workplace but also during travel to and from the workplace. Research in most AMCs provides evidence, although fragmented, of these trends, suggesting that it is restrictive labour markets, rather than restrictive social norms, that are the main obstacles to the expansion of female employment.

3.2 Gender segregation in science

In Europe, research on gender segregation in scientific careers is a relatively recent field which has developed in close connection with political debates and initiatives to foster women’s advancement in science. In the 1980s, the focus was on gendered socialization – how from an early age individuals internalise ‘feminine’ and ‘masculine’ roles that shape their educational and professional choices. Women were said to be less professionally ambitious than men and to give priority to their family over their career. Criticism of this position emerged gradually since the late 1990s when it was claimed that it was not enough to ask women to ‘fit in’ to science: the manner of teaching science and how scientific jobs were organised also needed to be changed. The focus thus moved from women to science, placing emphasis on subtle discrimination in scientific practices and gender bias in scientific knowledge.

The results of our work show that policy debates and initiatives to foster women’s advancement in science are just emerging in the AMCs whilst research in this field is scarce. Research rather focuses on the root causes of gender segregation in employment, including horizontal segregation in education, with only a few studies that specifically deal with gender segregation in scientific careers.

A first strand of the literature, namely in Lebanon and Tunisia, focuses on mapping the presence of women in science and technology and uses statistics to illustrate the existence of horizontal and vertical segregation. This is combined with an effort to give greater visibility to women’s achievements in science.

A second strand of the literature more specifically analyses the situation of women in one particular subfield of science. Research in this field is particularly developed in Tunisia, with studies focusing on engineering, physics and exact sciences. Studies have been also identified in Algeria, Egypt and Morocco. A common trend in these studies is to highlight the severe underrepresentation of women in decision-making positions.

Yet vertical segregation in scientific careers is an under-researched topic in the AMCs, with only a few studies in Tunisia. Ben Hassine (1999, 2004) states that vertical segregation is partly due to the fact that recruitment, nomination and promotion commissions remain male bastions of power, through cooptation practices that favour male candidates over their female counterparts. This contributes to the increasing scarcity of women as one advances up the levels of the scientific career. However, additional factors are at play in explaining why the scientific career remains marked by a gender bias. These factors include the unequal division of responsibilities in the household and the career penalty associated with motherhood, which limits women in their professional advancement and reduces their chances of being promoted to
higher positions in the hierarchy. The so-called objective and gender-neutral character of promotion rules is thus challenged. Promotions in the area of scientific research are conditional upon the publication of a number of articles in selected scientific journals. Women being in charge of the lion’s share of care and domestic work generally face great difficulty in increasing their scientific production at the same rate as men and therefore tend to fall back in the academic hierarchy.

Research suggests that many of the problems faced by women scientists are the same as those faced by women around the world (Ben Hassine 1999, 2004; Hassan 2001; Dajani 2014). Gender imbalance across study fields is related to gendered socialisation and reinforced through the education system. Family and career tensions help to explain why fewer women than men engage in a scientific career and more women than men leave academia at an early stage in the scientific career. Obstacles to women’s promotion are related to subtle discrimination and cumulative disadvantages in career advancement. The lack of transparency in decision-making processes and the persistence of unconscious gender bias in assessing scientific performance are major factors at play.

However research also stresses that there are other social factors, specific to the AMCs, that limit women’s career prospects. Prof. Farkhonda Hassan, professor of geology at the American University of Cairo (Egypt) highlights in “Science” that “there are a number of sociocultural factors that limit career advancement opportunities in science and technology for Muslim women. Women are raised and educated in a male-dominated society with very traditional attitudes and constraints. These vary greatly not only from one Muslim country to the next, but also between, for example, urban and rural areas of the same country. Other factors, well known to Western women, also exist, such as the challenges of combining responsibilities for a household and family (usually extended family) with a professional career. In addition, because scientific communities are highly resistant to change and science itself advances at a remarkable pace, it is extremely difficult for a woman to re-enter the scientific workforce once she has put her career on hold to raise a family” (Hassan 2001). Dr. Rana Dajani, assistant professor of molecular biology at the Hashemite University in Zarqa (Jordan) and Fulbright visiting professor at Yale University, stresses in "Nature" that some of the problems faced by women scientists in the Middle East are the same as those faced by women around the world, although “women also have challenges specific to the Middle East. These may not be so obvious because they are subtle, and must be identified, studied and solved by Arab women themselves” (Dajani 2012).

In addition, research reveals that scientific institutions are not free from problems such as sexual harassment and unequal pay. A study in Morocco brings to the fore the incidence of sexual harassment in universities (Ghissassi and Moulay Rachid 2003). Studies on the work climate in European academic institutions tend to highlight that a male-dominated environment can be hostile to women in several ways, from difficulties in socialising with male colleagues to bullying and sexist attitudes. The most blatant one is sexual harassment, a particularly delicate matter which tends to remain unarticulated and underestimated (Bagilhole and Woodward 1995). As regards pay, a study in Jordan found a gender-based pay gap of 23% in private universities (ILO 2013). Concern about unequal pay in academic and research institutions is also present in Europe and elsewhere since the Massachusetts Institute of Technology (MIT) publicly admitted having given less pay and resources to female than to male scientists of equal seniority (MIT 1999). To carry out pay-gap audits in all research institutions is one of the recommendations for improving gender equality in science (EC 2012). Overall, research shows that measures are needed to foster a work
environment that is more supportive of women in science in the Arab world in both academia and the private sector (EIU 2012).

Although evidence is only fragmented, it sets forth a clear picture of gender segregation in scientific careers. The “International Conference on Women in Science and Technology in the Arab Countries" organised by the Organization for Women in Science for the Developing World (OWSD) in Kuwait in 2013, highlighted two basic facts:

“Women have made significant advances in science and technology professions during the past decades. However, they often lag behind men in pay, access to resources, and opportunities for promotion and advancement into leadership positions.
While their numbers in university science programs are at historic highs, a growing body of research shows that a host of cultural pressures, family responsibilities, and professional frustrations drive too many young women out of scientific careers. This has high costs for the women, but also for national institutions, economies and societies”.

(owsd.ictp.it/Files%20for%20download/the-role-of-arab-women-in-addressing-global-environmental-and-development-challenges-in-the-region)

Literature in the AMC, as in other countries, reflects the concern that this situation is clearly at odds with the scientific ethos of universalism and meritocracy. Prof. Ismail Serageldin, Director of the Bibliotheca Alexandrina, clearly expressed this concern in his address to the Annual Meeting of the Academy of Sciences for the Developing World, held in Egypt in 2005:

“Why should we be concerned by the inadequacy of the representation of women among practising scientists?
For two separate and distinct reasons.
First, it is one more domain where the obstacles to women’s advancement are manifesting themselves, and should be overcome, as part of the ongoing struggle to get the rights of women recognized as inalienable human rights.
Second, science itself and the practice of science, is ill served by biases of any kind, and this pernicious discrimination is one that must be ended.” (Serageldin 2005:7).

It is expected that research will develop as a result of increasing awareness and pressure to implement policies and measures to support women’s advancement and gender equality in science. More research in this field is certainly needed.

4. POLICIES ON GENDER EQUALITY IN SCIENCE

Despite impressive progress in the AMCs towards gender equality in education and health, women’s political and economic participation has not improved at the same pace. This trend is also observed in science. Women are more present than ever in higher education and research but remain severely underrepresented at the top of scientific careers.

The statistical analysis carried out in SHEMERA shows that the situation of women in science in the AMCs
has many similarities with the EU countries. This is a remarkable fact, as women’s access to higher education is a more recent trend and gender inequalities in employment are more pronounced in the AMCs. This section shows that differences between EU and AM countries are also sharp in the policy context and the extent to which gender equality policies in science are developed.

4.1 Policy context

Employment opportunities and career prospects for well educated women in the AMCs, and in particular for women who want to pursue a scientific career, are shaped by a policy context that is marked by specific distinguishing trends as compared to the policy context in EU countries. This includes both the research and innovation system and the equality climate.

4.1.1 R&D expenditure, outputs and recognition

The AMCs lag behind compared with Europe and North America in terms of R&D expenditure, outputs and recognition. In the Arab countries, private sector investment in science, technology and innovation is reported as ‘minimal’.

Brain drain is a major issue in Arab countries. It depresses investment in S&T capacity as the rewards of this investment are lost as soon as the trained population moves abroad. Current data indicate that about one third of qualified scientists and engineers, born in developing countries, move to developed nations to work.

The "Arab regional strategy for science, technology and innovation" (March 2014) urges Arab states to increase financial support for research and development to 3% of Gross Domestic Product, with the private sector contributing 30% to 40%. The strategy aims to target some long-term weaknesses in the R&D systems in the Arab World. It seeks, inter alia, to improve the attractiveness of research careers in order to tackle the brain drain and to strengthen university-industry linkages in order to promote innovation (http://monitor.icef.com/2014/04/boosting-science-and-technology-collaboration-among-arab-states/).

4.1.2 Equality climate

Women’s legal status shows a clear divide between the AMCs and the EU countries, although indirect, subtle forms of discrimination are found to varying degrees in both sets of countries.

All AMCs have constitutional clauses that set out the equality of citizens and all have ratified international conventions that affirm gender equality, such as the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW). Nevertheless, there are laws that differentiate between the sexes in all AMCs and all maintain reservations to CEDAW.

Gender norms tend to be in line with the traditional male breadwinner model which confines women to the home and limits access to economic and political power to men. Traditional gender norms are also present in the EU and other Western countries, but they appear to be more pronounced in the AMCs. The persistence of patriarchal attitudes and strong stereotypes about the roles and responsibilities of women
and men in family and society is a major obstacle to the advancement of women in society.

The political climate in the region is turbulent, marked by the so-called Arab spring, the increasing influence of ultra-conservative Islamist parties, the persistence of the Palestinian-Israeli conflict and the war in Syria. Prospects for women's rights are unclear. Whilst military conflict seriously undermines any progress in this field, there is also pessimism in the aftermath of the revolutions in Tunisia and Egypt, since much of the progress made in the last decade was prominently linked to the former regimes. Both secular and Islamic women's movements in the region consider ultra-conservative Islamism a serious risk for the prospects of women's rights. The words of Prof. Dr. Rana Dajani, assistant professor of molecular biology at the Hashemite University in Zarqa (Jordan) accurately reflect the opportunities and threats of the current volatile situation: "I see the Arab spring as an opportunity for women to learn about their rights and to advocate for them — to distinguish between what is tradition and what is religion. This would weed out extremists who, through ignorance, distort the image of Islam. And it would weed out opportunists who want to misrepresent Muslim women. In the period of the Islamic civilization that flourished in the Middle Ages there were more than 8,000 women scholars. There are many more on the way today" (Dajani 2012).

4.2 Gender equality policies in science

Initiatives to promote gender equality in science have developed worldwide over recent decades. Ensuring equal opportunities in education has been a common international concern since the Beijing Platform for Action in 1995 called on governments to eliminate disparities between women and men in both access to education and educational outcomes. Significant advances in women’s equal access to education have paralleled a growing concern about the underrepresentation of women in scientific careers and especially in decision-making positions. Evidence from all over the world shows that progress in this field is at best slow and cannot be taken for granted. Gender equality is one of the eight United Nations Millennium Development Goals and this clearly calls for action in the field of science, technology and gender.

Evidence from the US and Europe has shown that, taken alone, affirmative action measures encouraging women to pursue scientific careers are insufficient to bring about real change. Affirmative action measures for advancing women’s science careers may be highly beneficial for individual scientists, but institutional constraints and implicit norms and values remain largely unchanged (Caprile et al. 2012). This has led to a shift in focus towards more systematic efforts to promote the structural transformation of institutions. The US has paved the way with the ADVANCE programme funded by the National Science Foundation, which started in 2001 (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383). In the EU, support for structural change has been progressively embedded in research and innovation policies over recent years (EC 2012). The UN’s 2011 agreement on women in science and technology underlines that progress in this area requires a systematic and comprehensive approach, “including policy, legislative and programmatic interventions and, as appropriate, gender-responsive budgeting, at all levels” (UN 2011).

In the AMCs, the issue of women in scientific careers has also attracted attention in recent years. The establishment of the Women’s Initiative (woman.astf.net) at the Arab Science and Technology Foundation (ASTF) in 2004 was a significant step forward. Major objectives of this initiative are to facilitate networking between individuals and institutions active in the field of empowering Arab women in science and
technology and creating further opportunities for young Arab women through fellowships and mentoring.

In 2005, the Annual Meeting of the Academy of Sciences for the Developing World, held in Egypt, discussed the lecture “Women in science: Time to recognise the obvious” addressed by Prof. Ismail Serageldin, Director of the Bibliotheca Alexandrina (Serageldin 2006).

The first conference on “Arab Women in Science and Technology: Empowerment for the Development of the Arab World” was organised with success by the ASTF in 2009 in Dubai, United Arab Emirates. The second conference was held in May 2014 in Khartoum, Sudan, under the title “Arab Women in Science and Technology for Sustainable Development”. Its aims were to emphasize the leading role of Arab women in science and technology, highlight the success of Arab women scientists, launch an infrastructure for communication between women in science and technology, and initiate working groups to develop projects to be implemented for the second phase of the Women’s initiative.

In 2013, the Organization for Women in Science for the Developing World (OWSD) organised the “International Conference on Women in Science and Technology in the Arab Countries” in 2013 in Kuwait.

Efforts to increase the visibility and recognition of women in science have also strengthened. In 2011, the Islamic Development Bank Prize for Women’s Contribution to Development focused on “Women in Science” and was awarded to Prof. Zoubida Charrouf, professor at the Chemistry Department of the faculty of Science of the Mohammed V-Agdal University in Morocco.

Over recent years, women scientists from the AMCs have also actively contributed to the debate on gender equality in science at international events and in international journals (Ben Hassine 1999; 2004; Dajani 2012; Hassan 2001).

Women in science networks have been established in some AMCs, with associations in Algeria, Lebanon, Morocco and Tunisia addressing a variety of objectives such as encouragement of girls to pursue SET studies, facilitation of networking of scientists, promotion of studies on women in science and research and support of women in scientific careers.

International initiatives and foreign grants are also playing a relevant role, providing support to women’s scientific careers and contributing to increasing gender awareness in scientific research. Examples of such initiatives are UNESCO activities and the mentoring programmes of the Embassy of the United States of America, such as TechGirl, TechWomen or IVLP WISE (Women’s Innovation in Science and Engineering) or fellowships for women such as those provided by UNESCO-L’OREAL, the Agence Universitaire de la Francophonie (AUF) or Schlumberger.

In spite of this, policy initiatives are scarce. More systematic efforts are needed at different levels in order to strengthen women’s situation in science and promote gender equality in the field. Advances in this field require political will and cooperation between a wide range of actors – namely governments, research institutions and the private sector. There is a pressing need for this. Increased awareness and networking around gender and science issues in the AMCs needs to be channelled into effective policy action.
4.2.1 Structures for gender equality in science

The setting up of units or steering committees at high-governmental level is considered a necessary step in order to give serious attention to gender equality in science and develop a consistent set of policies and initiatives in the field. This has been the experience of some European countries with the establishment of National Steering Committees or Gender Units at ministerial level to focus on gender equality in science (Rees 2002:9). One of the recommendations of the EC report on structural change in organisations is to “create organisational structures on gender and science at the highest possible governmental level, with good resources of personnel, expertise and funding” (EC 2012:44).

These structures are present in some of the AMCs, usually linked to more general gender mainstreaming strategies which have been launched recently.

In Egypt there is a Gender and Equal Opportunity Unit in the Ministry of Higher Education, as well as in all ministries. Gender units were created in order to mainstream gender into the five-year development planning, starting from 2002-2007. Their objectives are:

• To integrate the perspective of women and equal opportunities in ministerial plans and programmes;
• To support monitoring and evaluation of progress in achieving equal opportunities in the programmes of each ministry;
• To train ministry staff on the integration of women and equal opportunities in programmes and projects;
• To cooperate with the Office of the Ombudsman to discuss and resolve complaints of discrimination against women.

Similarly, science and research issues in Lebanon are directly linked to the Higher Education Ministry, in which a gender focal point is actively represented. The role of the gender focal point in each ministry is as follows:

• Advise ministry on gender equality issues, practices and policies relevant to gender mainstreaming in each sector;
• Assess proposals/documents for the inclusion of gender issues and, where appropriate, suggest ways in which gender can be incorporated;
• Liaise with the National Commission for Lebanese Women (NCLW), NGOs, World Bank, UNDP, UN Women on Gender, and other development partners. The collaboration between NCLW, NGOs, ministries and public institutions will be strengthened through a new Gender Equality program that was launched in February 2014 by the NCLW and funded by the EU;
• Be involved in the process of drafting reports on women’s issues.

However, even when ministerial gender units have been created, there seems to be little awareness and policy commitment to gender and science at the highest government levels in the AMCs. None of the AMCs has developed a national strategy for addressing bias and barriers to women’s careers in science and there is no legislation requiring universities and research institutions to adopt gender equality plans. In Palestine, the Ministry of Higher Education established a steering committee for developing a national strategy on science and technology in 2000. The strategy devoted a whole chapter to women in science but was never finalized. The Ministry has a unit of scientific research, mostly involved in information collection and reporting, and a council for scientific research, but no specific agenda for gender issues.
The University reform in Morocco (Emergency Plan 2009 - 2012) was launched with the aim of strengthening higher education and research in order to meet the demands of the labour market and economic development. However, the reform did not issue any specific recommendation on equal opportunities for women in research and technology, and gender issues are also absent in the Action Plan 2013-2016.

4.2.2 Gender balance measures

Adopting gender balance measures such as quotas or targets can be an effective although contentious way to address the underrepresentation of women in scientific careers and particularly in top decision-making positions. The use of quotas involves preferring women to men in appointments (where equally suitable candidates exist) in order to achieve a better gender balance. Quotas can encourage applications from good women candidates who might not otherwise have felt it worthwhile to apply, although they can also give rise to accusations of tokenism. Setting targets implies taking active measures to encourage more applications from women. They tend to be time-limited and are often seen as a less contentious form of positive action.

In some of the EU countries there is legislation to ensure a gender balance in public bodies which has had an impact on scientific committees and boards. The usefulness of fixing quotas in order to achieve a critical mass of women in scientific decision-making positions has been a fiercely debated question. In the Nordic countries, where such quotas apply, the share of female board members approaches equality (respectively 49%, 46% and 45% in Sweden, Norway and Finland). Similarly, when equality plans in scientific institutions are developed, they tend to adopt some kind of gender balance measure in combination with other initiatives in order to address disparities (Caprile et al. 2012). The UN explicitly recommends to “set concrete goals, targets and benchmarks, as appropriate, while supporting a merit-based approach, to achieve equal participation of women and men in decision-making at all levels, especially in science and technology institutions, such as science academies, research funding institutions, academia and the public and private sectors, as well as in the design of science and technology policies and research and development agenda-setting” (UN 2011). Adopting gender balance measures is also in line with the UN Millennium Development Goals and CEDAW recommendations to enhance women’s participation in public life and decision-making positions.

In many AMCs, the use of quotas is a hot issue, although mostly in the field of political participation. Quotas may establish a minimum presence of women in electoral lists or reserve a share of elected positions for women. Morocco and Jordan started to apply quotas in elected positions in the early 2000s; quotas in electoral lists have been applied in Palestine since 2005 and very recently in Algeria and Tunisia, whilst the adoption of an electoral quota is now under debate in Lebanon where religious quotas are adopted (the confessional quota system distributes power, benefits, and posts).

In general, quota measures are contributing to increasing women’s presence in political life. In Jordan, the share of women in the Senate increased from 2.6% in 1990 to 13% in 2013; from 0% to 12% in the House of Representatives; and from 0.5% to 24.8% in 2013 in municipal councils. Moreover, women’s presence in the government at ministerial level shows a growing trend, from a share below 5% in 1990-2000 to 12.3% in 2013. However, in many countries women’s organisations are critical, claiming that quotas are
too low and are not systematically observed in electoral lists. In Palestine the Elections Law of 2005 for both local councils and general elections stipulated a minimum quota of 12% of women in the electoral lists whilst many Palestinian women’s organizations are calling for a minimum quota of 20%. Besides, the quota was not observed in many electoral lists in the local council elections of 2012, showing that there is no law enforcement to ensure compliance with the quota.

Some countries (Syria and Tunisia) have adhered to CEDAW target of 30% of women in decision-making positions, implementing for this purpose non-quota measures. In Tunisia, the joint circular of the Ministry of the Interior and the Ministry of Women's Affairs and the Family (1998) invited the governors of the regions to systematically appoint at least two women among the members of regional councils. As a result, women currently represent 32% of all members in these councils. These women are virtually the only women in Tunisia’s interior regions to take part in decision-making at the regional level. In Syria, specific targets for women’s presence in decision-making positions were for the first time clearly incorporated in the country’s five-year planning in the early 2000s. The Ninth Five Year Plan established specific goals to strengthen the participation of women in economic development and the executive, legislative and judicial branches of government, as well as different decision-making positions. The Syrian Commission for Family Affairs developed a strategy for this, with 30% representation set as the target.

However, developments in the field of political participation so far have had no impact on scientific and research structures. Despite women’s severe underrepresentation, there is no official engagement on gender balance for the boards of academic institutions and other research structures.

4.2.3 Statistics and indicators

The availability of sex-disaggregated statistics is essential to raise awareness and encourage sound evidence-based policy making in the field of gender and science. In many EU countries, where such data were absent or not publicly disseminated before, the EC’s decision to publish She Figures in 2003 finally made it possible to measure the extent of gender imbalances in science and design policies to reduce them. Since then, She Figures has been regularly issued every three years to monitor gender equality in the field. One of the basic recommendations of the UN is to improve and systematize the collection, analysis and dissemination of data and to develop gender-sensitive indicators to support legislative development and policy-making on education, training and science and technology.

Sex-disaggregated statistics in education, employment and other fields are available and regularly published in all the AMCs, although with great variety as regards the scope and refinement of data provided.

The situation also differs as regards the level of official engagement. Some countries (Lebanon, Syria have been publishing sex-disaggregated statistics since the early 2000s, although there is no official commitment to this. On the contrary, other countries are making substantial efforts to improve the set of available sex-disaggregated statistics. This is particularly the case in Algeria, Egypt, Jordan and Palestine.

Algeria created in 2013 “EL INSAF” database. This database gathers all sex-disaggregated statistics for measuring achievements in human development at national, regional and local levels. Eleven ministries
are already involved, including the Ministry of Higher Education and Scientific Research. A file for researchers and experts in gender has been developed for the purposes of the programme to promote gender equality and the empowerment of women in Algeria. In Egypt, the National Council for Women, in cooperation with the central statistical agency, is involved in the GEMS project (Gender Equality Measured through Disaggregated Statistics), which aims to support policy-making through the provision of accurate statistical information on the extent of gender gaps. The Jordanian National Employment Strategy (2011-2020) includes a set of indicators for measuring progress as regards women’s employment, including: percentage of women’s participation in the labour force, number of beneficiaries of maternity insurance, number of professional licenses issued to women working at home, number of female beneficiaries of the training programmes at worksites funded by the government and number of women enrolled in social security. In Palestine, the Central Bureau of Statistics has also shown a strong commitment to improving the set of sex-disaggregated statistics over recent years.

Yet the sets of available statistics are not sufficiently refined to evaluate and monitor the situation of women in science. An R&D survey exists and is regularly conducted only in two AMCs: Palestine and Syria. LFS surveys are also not systematically carried out in the AMCs as they are in Europe, where not only has each country its LFS survey but also national data are systematically harmonised at the European level. There is a pressing need for the AMCs to elaborate statistical data following the example of what is being done in Europe (R&D surveys, Labour Force surveys, data on wages, and so forth). The experience of collecting data in SHEMERA shows that not only are key data missing but available data are often of lower reliability, comparability and quality. Further efforts are needed in all the AMCs.

4.2.4 Gender and university curricula

All over the world, gender research has had an enormous impact in the humanities and social sciences over the past thirty years and is increasingly being integrated into medicine and the life sciences, although it is far less developed in natural sciences, engineering and technology. The emergence and consolidation of gender research centres at the universities is a consistent international trend which has allowed many universities to offer degrees in women’s and gender studies as well as optional modules in undergraduate and postgraduate gender courses. However, a systematic integration of the gender dimension into university curricula is far from being achieved. The UN explicitly encourages “the integration of a gender perspective in the science and technology curricula throughout all stages of education and continuous learning, and the use of gender-based analysis and gender impact assessments in research and development in science and technology, and in the promotion of a user-driven approach to technology development in order to increase the relevance and usefulness of advancements in science and technology for both women and men”.

In the AMCs, degrees in women’s and gender studies are mostly offered in Morocco. Women’s and gender studies research centres have been created in many universities over recent decades and several of these centres have developed postgraduate programmes (the first one being created at the University of Fez in 2000), producing the first cohorts of MA and later PhD students in gender studies starting from the early 2000s.

Degrees in women’s and gender studies are also conferred in public universities in Jordan and Palestine.
and private universities in Egypt and Lebanon. In Jordan, the Centre for Women’s Studies at the University of Jordan grants a Masters degree in Women’s Studies. As regards Palestine, there is a Masters program in gender and development at Birzeit University since 1996 and another in Al-Quds University since 2002. In addition Birzeit University has a Women’s Studies’ Programme which has been offering optional courses for undergraduate studies since 1994 and minors since 2012. In Lebanon, the Women’s Studies Diploma was launched in 2010 at the Beirut Arab University. It is a one-year interdisciplinary program that combines the humanities, law and public health. A Master’s degree in Women and Gender Studies will be launched in the fall 2014-2015 at the Lebanese American University in Lebanon. This M.A. degree is seeking to prepare graduates for professional employment and further higher studies. This degree integrates gender, class, race, religion, culture, ethnicity, and sexuality and enables students to generate interdisciplinary and quality research in the field of women and gender. The M.A. degree in Women and Gender Studies is vital not solely for the production of knowledge about women’s lives and status globally, but also as a platform to address women’s problems within the contemporary cultural, social, and political environment and challenge professed wrongs and abuses through academic research and intellectual rigor. Finally, the American University in Cairo, Egypt hosts the Cynthia Nelson Institute for Gender and Women’s Studies (IGWS). It is an academic research institute and a graduate teaching centre for scholars, researchers and graduate students interested in gender issues in the Middle East, Africa and South Asia.

The Institute for Women’s Studies in the Arab World (IWSAW), established in Lebanon in 1973, is committed to academic research on women in the Arab world. The institute seeks to empower women through development programmes and education, and to serve as a catalyst for policy change regarding women’s rights in the region. IWSAW has established a master’s degree in Women and Gender Studies, which the Lebanese American University will launch in the autumn of 2014-2015. Al-Raida, IWSAW’s flagship interdisciplinary journal, has addressed gender in historical and contemporary contexts since 1976. Al-Raida has recently evolved into a biannual, double-blind, peer-reviewed journal.

Women’s and gender research centres are present in many universities in the region, and several offer specialised gender courses, namely in the social sciences and humanities. In Jordan, special attention is paid to raising awareness on gender-based violence, with specialised courses in three universities. This is also a trend in Syria, where the Ministry of Higher Education in collaboration with the Syrian Commission for Family Affairs and other entities are committed to revising the school curricula to raise gender sensitivity and include concepts of gender-based violence. To the best of our knowledge, there have not been other initiatives aimed at integrating the gender dimension into university curricula. University reforms and legislative development do not address this subject.

There are three UNESCO Chairs on women’s issues in the region: the Chair on Women’s Rights, established in 1999 at the University Mohammed V, Rabat- Souissi - University IbnToufail, Kénitra, Morocco; the Chair on Women’s Studies, established in 1999 at the Centre de recherches, d'études, de documentation et d'information sur la femme (CREDIF), El-Manar II, Tunisia; and the Chair for Women, Science, and Technology, established in 2009 at Ain Shams University, Egypt. In Algiers, Algeria, the University Houari Boumediene holds the Chair on Women in science and technology in partnership with the National Commission UNESCO – ISESCO – ALESCO and the High Islamic Council (ISESCO: Islamic Educational, Scientific and Cultural Organization; ALESCO: Arab League Educational, Scientific and
4.2.5 Mentoring

Mentoring schemes link senior scientists to junior colleagues for advice and support. Action to develop career advisory, networking and mentoring programmes is one of the UN recommendations for increasing retention and progression of women in science. The presence of women as senior scientists in mentoring schemes contributes to the visibility and recognition of women in science. Where mentoring is a relatively institutionalised practice, as in the US, there is evidence that a satisfactory mentoring relationship has a clearly positive impact on the career outcomes of women and minority groups, with this effect with regard to men being less significant. Formalised mentoring relationships may provide, for those who do not conform to the implicit academic ‘norm’ — women, minority groups — the kind of built-in support that most men get inadvertantly through informal relationships (UN 2011).

As stated by Prof. Rana Dajani: “Men mentor each other and spend time together after work, fostering the men’s club. Women rush home to take care of children, not because they have to but because they want to. This is a major obstacle for women scientists in terms of opportunities, learning and support. That is why mentoring projects — something we lack in the Arab world — are important” (Dajani 2012). Prof. Rana Dajani is now in charge of the first mentoring programme for women in academia in Jordan, which launched the pilot phase in November 2013 under the auspices of the Jordan TEMPUS office and the Hashemite University.

Overall, mentoring is not an institutionalised practice in the AMCs as regards junior scientists of both sexes. Specific mentoring programmes for women are usually linked to international initiatives, such those of the Embassy of the United States of America, TechGirl, TechWomen, IVLP WISE (Women’s Innovation in Science and Engineering). In Egypt, the Cynthia Nelson Institute for Gender and Women’s Studies (IGWS) at the American University El Cairo has a mentoring programme. Similarly, the “Female mentoring project” was launched recently at Cairo University. It is a joint project between the Centre for the Study of Developing Countries (CSDC) at the Faculty of Economics and Political Sciences, Cairo University, the Association for Women’s Total Advancement and Development (AWTAD) and the regional programme “Economic Integration of Women – MENA” (EconoWin). EconoWin is supported by the “Deutsche Gesellschaft für Internationale Zusammenarbeit” (GIZ) GmbH and commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). The mentoring project is carried out as part of the Ana Hunna initiative.

4.2.6 Equal access to funding

Ensuring equal access to research funding is one of the basic means of advancing gender equality in science. Evidence shows that unconscious gender bias is in place in the process of allocating grants, fellowships and other funds. Influential studies show that in general men fare better than women in the assessment process (EC 2012). The UN recommends incorporating a gender perspective into budgetary policies at all levels to ensure that public resources in education and science equally benefit women and men.
Early measures in the EU adopted an affirmative action approach. Earmarking resources for women in science can take the form of professorial chairs, research funds and scientific prizes for women or girls. Overall, such measures proved to be contentious and sometimes attracted criticism for being, allegedly, a way of patronising women. However experience also showed that it was only by explicitly making it known that women applicants were especially welcome that more women started to apply (Rees 2002; Caprile et al. 2012). This kind of initiative may be useful for encouraging women and helping them to gain experience. Nevertheless, current developments in Europe have mostly shifted to ensure equal access to research funding by integrating gender requirements for allocating research funds on the basis of a meritocratic approach. This may include an explicit preference for women when applicants show equal performance as well as other measures to avoid gender bias in assessment procedures like transparent decision-making and making sure that decision-makers and evaluators have the appropriate training to avoid gender bias. The same applies to the consideration of sex and gender analysis in research content and the allocation of funding to support gender research specifically.

Overall, this line of action has not been developed in the AMCs. Funding allocation in research is based on a merit-based approach without any gender-related criteria for enhancing equal access to funding. Special funds or prizes for women are also scarce in the region and linked to international activities, such as the fellowships for women provided by UNESCO-L’OREAL, Agence Universitaire de la Francophonie (AUF) or Schlumberger.

4.2.7 Work life balance in scientific careers

Family and career tensions disproportionately affect women in science as compared with their male colleagues. These tensions are especially acute in the early stages of the academic career, where intense productivity and mobility demands coincide with women’s childbearing years and social expectations about the right moment to establish a family. In the framework of unequal gender relations, the wish to enjoy a family life deters some women from engaging in research, makes them withdraw from science or stops their progress, whereas other women choose to postpone motherhood to a later age or not to have children. Work/life balance measures for both women and men are considered essential for addressing gender imbalances in scientific careers. In addition to legislative development, a change in institutional practices is required because family and career tensions are usually exacerbated by institutional constraints and implicit academic norms, values and expectations that take the traditional male life-course as the norm.

The UN calls for legislation and policies to promote the reconciliation and equal sharing of employment and family responsibilities between women and men. Essential aspects are maternity and paternity leaves that promote co-responsibility of father and mother in parenting and affordable, accessible and quality care services for children and other dependent persons. On the other hand, the UN encourages research institutions and funding agencies “to establish flexible and non-discriminatory work policies and arrangements for both women and men, such as time extension on research grants for pregnant researchers, leave schemes, quality care services and social protection policies, in order to improve the retention and progression of women in science and technology” (UN 2011). Advances in the EU are not widespread but usually stem from a combination of legislation, employment and social policies and equality plans at research institutions.
Overall, this is a field which clearly requires further action in the AMCs. Maternity leave conditions vary greatly in AMCs. It is shortest in Tunisia, with only 30 days, and longest in Syria, with 120 days for the first child, 90 for the second and 70 for the third. In all other countries, it ranges from 70 to 98 days (Lebanon extended maternity leave from 49 days to 70 in April 2014). Maternity leave is 100% paid except in Tunisia, where benefit is only 66.7% of the average daily wage. In most countries, paid hours of breastfeeding are granted, usually one hour per day within a year of the delivery date. In some cases, women are entitled to maternity leave under certain conditions: for example, in Egypt women can benefit from this leave only three times during their time of service to the employer.

In several countries, maternity leave is longer for women working in the public sector. The contrast is especially marked in Tunisia, the country with the worst maternity leave conditions in the private sector (30 days paid 66.7%) whilst the public sector provides two-months fully paid maternity leave, which can be extended to four months paid at 50%.

Other work-life balance measures have proven to be less popular, as they entail a substantial loss of salary. In Tunisia, women working in the public sector with children under 16 or with a handicapped child are entitled to work part-time while receiving two-thirds of their salary for a period of three years, twice renewable. In Algeria women are entitled, on request, to a leave ranging from 0 to 5 years to raise a young child. Although the law guarantees reincorporation in work, the leave taken is unpaid.

Paternity leave is almost absent in the area, with only Algeria and Tunisia granting a few days (3 days in Algeria; 1 day in the private sector and 2 days in the public sector in Tunisia). The need to establish or extend such leave is not discussed in current policy debates, although the women’s movement is actively claiming such leave in Lebanon. Deep-rooted cultural reasons are behind this fact, according to many SHEMERA experts. However, it is worth noting that several NGOs are working to introduce such leave in Jordan, where the National Council for Family Affairs (NCFA) recently introduced a three-day paternity leave for its male employees.

Additional major concerns are the lack of adequate care services for children and dependent adults and employment conditions unsupportive to motherhood and family life (UNDP 2006).

Specific work/life schemes for scientists are almost inexistent. Women in academia may benefit from better working conditions than those offered in the private sector, but work-life balance continues to be a women’s issue and there are no specific arrangements for scientific careers. There are no specific laws or official recommendations in the field and research institutions follow the prevailing trend in the region, where work/life measures are not prominent in human resource management. On the positive side, it is worth noting that Syria removed gender-discriminatory regulation concerning mobility support to PhD students in 2008. The old regulation provided economic support for the family (spouse and children) of male PhD students studying abroad and was amended in order to give women the same rights as men. Syria is also the only country having some measure in place to support scientists willing to re-launch their careers after a career break. Returnees may benefit from financial support, provided the career break is limited to 3-4 years. This measure is addressed to graduate students of both sexes and addresses career breaks due to family reasons or other circumstances such as mobility or military service.
4.2.8 Equality plans and related gender equality measures

As previously stated, none of the AM countries have enacted legislation or implemented measures concerning this point. Universities and research centres are not encouraged to set up gender equality plans or develop the institutional framework of gender equality through gender units or gender observatories. Moreover, to the best of our knowledge, bottom-up initiatives are almost inexistent. If equality plans exist, they are not publicly presented. The only good practice identified in this field concerns the Birzeit University in Palestine, where the Institute of Women’s Studies, after exerting serious pressure on the university administration, is starting a gender task force to address existing disparities.

Yet action at universities and research centres is considered essential to remove obstacles to women’s professional careers. In Europe, research has shown the effectiveness of equality plans and equality officers for advancing gender issues in research institutions (Castaño et al 2010). In order to increase retention and the promotion of women in science the UN calls for a modernisation of research institutions, making them more gender-aware. Among other things, it states the need to “encourage the use of clear and transparent criteria for, and to promote the achievement of gender balance in, recruitment, promotion and recognition in science and technology, both in the public and private sectors, to train and sensitize leadership and staff, at all levels, in gender mainstreaming and gender equality issues and prevent direct and indirect discrimination against women, and to support the building of leadership skills for women”.

5. POLICY RECOMMENDATIONS

1. Enhancing political will and increasing cooperation between key actors

The advancement of women in science requires political will and cooperation between different actors: government, scientific institutions (academic, educational, research and funding institutions), private companies, professional associations, employers’ organisations and trade unions and women’s and other relevant non-governmental associations. Political will and cooperation should be firmly rooted in the view that promoting gender equality in science is not a women’s issue. It concerns and should fully engage men as well as women. Wasting women’s talent is unfair to women but also bad for science and society.

2. Supporting policy-making through data gathering and research

Governments should implement the necessary measures to strengthen the evidence base for sound policy making in the field of gender and science. There is a pressing need for the AMCs to elaborate statistical data as is being done in Europe (R&D surveys, Labour Force surveys, data on wages, and so forth). Not only are key data lacking but available data are often of lower reliability, comparability and quality. Further research is needed in order to identify the set of constraints, barriers and biases that undermine women’s access, retention and promotion in science on equal terms with men. Such research is only possible when good data are collected regularly.

3. Establishing appropriate governmental structures for promoting gender equality in science
Governments should establish gender and science units at the highest possible governmental level with appropriate resources of staff, expertise and funding. These units should act as focal points for preparing and monitoring national strategies for gender equality in science with the involvement of all key actors.

4. Encouraging scientific institutions to adopt gender equality plans

Governments should enact legislation and implement measures to encourage and support scientific institutions to adopt gender equality plans. At the institutional level, basic prerequisites are: getting the support of persons in high-level responsibility positions, carrying out a sound audit of the institution (data and indicators), establishing a gender equality unit in charge of monitoring gender equality and implementation of preventive and corrective measures. Gender equality plans should address a wide range of policies, including:
- Gender balance in committees;
- Gender-neutral criteria for promoting equal access to scientific positions and funding;
- Transparency in decision-making;
- Mentoring, networking, role models;
- Work-life balance measures for both women and men;
- Gender-sensitive measures to promote mobility and dual careers;
- Measures for enhancing gender awareness and removing gender bias;
- Gender impact assessment of procedures and practices.

5. Deepening the gender dimension of education policies

The education system (primary, secondary and tertiary education) should adopt a more proactive role to fight gender stereotypes. It should carry out gender proofing of curricula and of pedagogical and counselling practices in order to remove gender bias. Measures are needed to promote a gender mix in all primary and secondary school study fields in order to favour a more gender-balanced distribution across study fields at later stages of the educational and professional career. The gender dimension should be integrated into university curricula in all study fields, including natural sciences and technology. High quality degrees in gender studies are needed for achieving a critical mass of gender experts at the national level.

6. Strengthening R&D as a precondition for improving women’s opportunities and prospects in science

Increasing public and private R&D expenditure is a challenge common to all AMCs. It is also a precondition for improving employment opportunities and career prospects for young women in science, both in academia and the private sector. Specific measures to facilitate women’s access to research positions in the private sector are required. Strengthening R&D also entails improving the quality of R&D outputs. Measures are also needed in order to foster the integration of the gender dimension in research content in order to better align R&D on societal needs and improve the lives of both men and women.

7. Enhancing south-south and north-south cooperation on gender and science

Many of the problems faced by women in science are common all over the world; others are specific to
certain regions or countries. International initiatives and foreign grants are playing an important role in AM countries – giving support to women’s careers and enhancing gender awareness. SHEMERA has demonstrated the effectiveness of south-south and north-south cooperation for promoting research and policy debate around gender and science issues. The project has also paved the way for a further strengthening of Euro-Mediterranean cooperation in this field.

8. Adopting an effective strategy for inclusive development and gender equality

The issue of gender equality in science cannot be disentangled from the wide range of gender inequalities in society at large. Legal, social and economic factors that undermine women’s status in AM countries have to be addressed in order to prevent any form of gender discrimination. Only an inclusive development strategy can ensure citizens’ equal access to socioeconomic and political rights and opportunities, irrespective of class, religion, ethnic affiliation and gender.

REFERENCES

Gadallah, M. 2011, ‘Factors of Career Mobility in Egypt by Gender’, Gender and Work in the MENA


[UN] United Nations 2011, Access and participation of women and girls in education, training and science and technology, including for the promotion of women’s equal access to full employment and decent work.
Potential Impact:
1. MEASURABLE AND VERIFIABLE RESULTS

The project has brought the following measurable and verifiable results:

- Online database of informed bibliography on gender and science in the AMC (MeD-GSD: Gender and Science Database in the Arab Mediterranean countries).
- Final synthesis report: "Gender and science - Time for action". A comparative report on gender and science, including statistics, literature, policies, and policy recommendations for all the AMCs (PDF publication in English, French and Arabic; hardcopy edition of 1,000 exemplars).
- Eight national reports on gender and science, including statistics, literature, policies and policy recommendations at the national level (one per AMC) (PDF publication in English, French and Arabic).
- Eight issues of the project e-newsletter, with highlights of the activities and outcomes of the project and other key features, including 24 portraits of women in science in the AMCs.
- Eight Task Forces on gender and science (one in each AMC), with representatives from relevant stakeholders (gender experts, associations of women in science, representatives of the scientific institutions, policy makers), to give support to the project and contribute to its dissemination.
- Eight national workshops on gender and science (one in each AMC), addressed to gender experts, associations of women in science, representatives of the scientific institutions, policy makers, to discuss the main findings of the project and the policy recommendations at the national level (from March 2013 to May 2014).
- Euro-Mediterranean workshop on gender and science, to discuss the main findings of the project and the policy recommendations, addressed to gender experts and representatives of the associations of women in science in EU and AM countries (May 30 2014).
- Euro-Mediterranean conference on gender and science, to disseminate the final report of the project and discuss the policy recommendations (October 20 2014).
- Website with all the results of the project, namely the reports, the e-newsletter and the online database.

2. EXPECTED IMPACTS

The expected impacts of the SHEMERA project might be summarised as follows:

a. Increasing knowledge on gender issues in science in the AMCs

The overall objective of the project was to enhance research cooperation on gender and science between the European Union and the AMCs. Fifteen years of data-gathering, research and comparative analysis in
The European countries has significantly improved the knowledge on gender and science issues and enhanced political debate and action. Similar experiences in the AMCs were scarce before the SHEMERA project started. The project provided state of the art descriptions, data collection and relevant comparative analysis on gender and science in all the AMCs, focusing on three key themes: statistics on women in science, research on gender inequalities in science careers and gender equality policies in science. The results of the project will substantially increase knowledge on gender issues in science in the AMCs.

b. Enabling further development of Euro-Mediterranean research cooperation in the field

The SHEMERA project developed the state of the art description, data collection and relevant comparative analysis taking into account cultural diversities and traditions in the AMCs whilst ensuring consistency with existing approaches, methodologies and models at European level, in order to facilitate future targeted comparison with available data and research from EU Member States and Associated Countries. Key references for data collection and comparative analysis have been "She Figures" in the field of statistics on women in science; the Helsinki report "National policies on women in science in Europe" in the field of gender equality policies and the "Meta-analysis on gender and science research" study for the analysis of scientific literature. This methodological approach has made it possible not just to compare the AMCs among each other but also to contrast the situation in the AMCs with the prevailing situation in the EU.

In fact, the policy recommendations of the project highlight the need to strengthen Euro-Mediterranean cooperation. Many of the problems faced by women in science are common all over the world; others are specific to certain regions or countries. International initiatives and foreign grants are playing an important role in AM countries – giving support to women’s careers and enhancing gender awareness. SHEMERA has demonstrated the effectiveness of south-south and north-south cooperation for promoting research and policy debate around gender and science issues. The project has also paved the way for a further strengthening of Euro-Mediterranean cooperation in this field.

c. Increase awareness among policy makers and other relevant stakeholders

The SHEMERA project has made the state of the art description, data collection and relevant comparative analysis accessible to the research community, policy makers and society at large in all AMCs via an online database, publishable reports and workshops with policy makers and other relevant stakeholders (scientific community, funding agencies, higher education institutions...). Enhancing policy debate through networking has been a transversal project activity in parallel to research work. Relevant activities have been the establishment of a task force and the organisation of a workshop on gender and science issues in each AMC; the organisation of a Euro-Mediterranean workshop and the organisation of a final conference.

d. Empowerment of women in science in the Mediterranean area

The SHEMERA project contributes to the empowerment of women in science in the AMCs, by increasing the knowledge on gender and science issues, promoting the Euro-Mediterranean dialogue of women in science and other gender-sensitive scientific associations and developing recommendations for policy
makers aimed at enhancing the presence of women in scientific research and technological development at all levels and ensuring a better integration of the gender dimension in research policy.

3. NETWORKING AND POLICY DEBATE

3.1 Task Forces on gender and science issues

Enhancing policy debate through networking has been a transversal project activity in parallel to research work. Networking activities started with the establishment of a Task Force on gender and science issues in each AMC. These task forces provided the opportunity to present SHEMERA to relevant stakeholders at the national level and to encourage them to support the development of the project’s activities.

In many AMCs, political turbulences have led to changes in the composition of these task forces, have delayed their establishment or have been detrimental for their regular activities. This has been especially the case in Syria and Tunisia. However, even in these countries the SHEMERA partners have been able to establish a network of relevant stakeholders to support the development of the project and raise awareness about gender and science issues.

3.2 National workshops on gender and science issues

Once the results of the project were available, the SHEMERA partners in collaboration with the members of the task forces organised national workshops in order to discuss the main findings of the project at the national level and discuss the policy recommendations.

In total, eight national workshops, one in each AMC, were organised between March 2013 and May 2014.

• Algeria: May 15th 2014, Algiers
• Egypt: January 22nd 2014, Alexandria
• Jordan: May 7th 2014, Amman
• Lebanon: May 8th 2014, Beirut
• Morocco: March 27th-28th 2014, Mohammedia
• Palestine: March 13th 2013, Birzeit
• Syria: March 18th-19th 2014, Aleppo
• Tunisia: May 24th 2014, Tunis

These national workshops were aimed at institutional policy/decision makers in the field of R&D policies, representatives of the scientific community and R&D organisations and students. Speakers included gender experts as well as ministry and university delegates. The workshops focused on the presentation of the research results and the debate of the policy recommendations for enhancing progress towards gender equality in science at the national level.

Agendas were adapted to the national circumstances. In some countries, the SHEMERA partners co-organised the workshop with other relevant institutions. It is namely the case of Lebanon, where the Faculty of Science at USJ and L’Oréal Levant organised the workshop in partnership with the French
In other cases, the workshop was organised as a session of a wider gender-related seminar. In Palestine, the workshop was integrated into the Fifth Annual International Conference of IWS titled: Education for Liberation and Social Justice. The attendees of the conference represented the entire spectrum of actors on gender from NGOs, Ministries, political and gender activists with academics and students. The presenters were academics at national universities, international universities, researchers at centres for women studies and development, public sector officials and civil society representatives. The SHEMERA national workshop was integrated in to the broader conference as the diversity of the conference’s participants would enrich the discussions and give constructive feedback.

A similar approach was taken in Syria, where the SHEMERA team, in spite of the war, was able to organise in collaboration with other members of the Aleppo University a symposium on women’s issues ("The Syrian Woman Symposium - Reality and Ambition"). A specific session of this symposium was devoted to SHEMERA. The symposium was chaired by the University Rector and representatives from the SHEMERA team. Among the attendees of the conference were the General Women's Union; the Directorate of Labour; the Syrian International Association for Women, war victims; the Committee of Business Women in the Chamber of Commerce; the Chamber of Industry; Judges and Lawyers; as well as academics and students.

3.3 Euro-Mediterranean workshop

The national workshops represented an excellent preliminary work and a good platform to prepare the discussion at the Euro-Mediterranean level. The purpose of the Euro-Mediterranean workshop was to enhance the dialogue between European and Arab Mediterranean associations of women in science, present the main findings of the project and the results of the policy debate in the AMCs national workshops, with the view to discuss a set of common policy recommendations for the Mediterranean area.

The workshop was organised by IDIS and held at its premises (Città della Scienza) in Naples on May 30th 2014. Around fifty persons – as expected - attended the workshop in a mix group of partners, gender experts and representatives from women in science associations both from European and Arab Mediterranean countries.

This workshop constituted a cornerstone in the SHEMERA research work programme. The purpose was to share first the experience on gender and science issues gathered in Europe in the past fifteen with the AMCs in order to discuss and challenge it in a wider and different context. The second objective was to go through the results of the project in the AMCs - both in terms of research (statistics, literature and policies) and actions (national task forces and workshops) - and debate policy recommendations in the area as foreseen in the final stage of the project.

The group of participants was consistent and diversified for their provenience, their field of competences
and their role:

• SHEMERA partners in the AMCs were in charge of identifying one relevant expert in their country.
• The project invited five representatives from women in science associations in Europe, selected for their experience and knowledge in the field whilst taking also into account their geographical background (Italy, Hungary, Spain, Sweden and United Kingdom).
• In addition two experts on women’s issues in Arab countries were invited to take part at the workshop for their expertise outside the field: one journalist (reporter from Arab Countries) and one specialist from Unesco.
• Finally this group was completed by the invitation of a limited number of experts from Italian organisations engaged in other EU projects on gender issues.

[Table 5: Participants at the Euro-Mediterranean Workshop, Città della Scienza, May 30th 2014]

The presentations, debates, and working group discussions allowed for new insight into the issue of gender and science in the individual countries as well as in the region as a whole.

The morning sessions were dedicated to presentations from both sides of the Mediterranean. The main research findings of SHEMERA were presented to the audience followed by the remarkable keynote speech by Prof. Teresa Rees who discussed the most relevant findings and lessons learned from previous European benchmarking projects on gender and science. Finally, a representative from the SHEMERA consortium in each AMC presented the outcomes and more specifically the policy recommendations from the national workshops.

The afternoon was dedicated to real exchange in three thematic groups to discuss suggestions and recommendations to promote gender equality in research: the presence of women; root causes of gender segregation in employment; policies and measures to promote gender equality. The results of the thematic working groups were reported in the final session as the basis for the discussion with the audience and with external experts.

3.4 Policy debate

The discussions and the ensuing policy recommendations of the national workshops were important in showing that despite the great cultural and structural differences between the Arab Mediterranean and the European countries there are also serious similarities in the participation of women in science. International efforts towards gender equality in research institutions still constitute an unfinished process in the evolving contexts of both sides of the Mediterranean basin and individual countries are in a position to learn from the experiences of one another.

The main problems stressed in the national workshops concerned the statistics, institutional mechanisms, employment policies and practices, and cultural bias.

The policy recommendations concerning the problem areas were addressed to a multiplicity of actors at several levels:
At the state level:
- Legislation i.e. reinforcing statistics pertaining to scientific research to be gender-sensitive and preparing a scientific research database that considers gender; prioritising efforts to achieve gender mainstreaming and gender budgeting in education, science and industry; setting up ‘surveillance system’s with specific indicators; developing effective communication/media strategies to improve the image of women in education and society
- Organizational structures on gender and science at the highest possible governmental level, i.e. national observatories, gender units at regional academies of the ministry of education
- Strengthening women’s economic enablement as well as their participation in the labour market through reviewing economic legislation, especially the social security law and the labour law

At the level of gatekeepers of scientific excellence:
- Gender in research, i.e. funding of specific programmes on women and gender
- Transparency and gender sensitive evaluation in recruitment, promotions and recognition
- Mentoring programs to motivate and encourage women to stand for positions of responsibility
- Networks of women scientists as well as mix

At the level of universities and scientific institutions:
- Integration of gender dimension into the university curricula
- Equality plans, i.e. gender action plans, road maps, institutional regulations,
- Gender balance in all decision making bodies, committees, etc.
- Gender fair distribution of research funding, encouragement of gender research
- Work-life balance schemes, women friendly work and study environment, gender sensitive academic bodies and research centres

The discussions held at the Euro-Mediterranean workshop highlighted two main basic points of great concern, even if difficult to approach: the need of a cultural change and the need to include men in the gender debates.

Both the national workshops and the Euro-Mediterranean workshop have been relevant to disseminate the results of the project, enhance policy debate and raise awareness on gender and science issues among relevant stakeholders in the Arab Mediterranean countries.

The proceedings of the national workshops and the Euro-Mediterranean workshops are public and available at the website of the project.

Based on this policy debate and the research results of the project, the following policy recommendations were adopted for all the AMCs:

1. Enhancing political will and increasing cooperation between key actors
2. Supporting policy-making through data gathering and research
3. Establishing appropriate governmental structures for promoting gender equality in science
4. Encouraging scientific institutions to adopt gender equality plans
5. Deepening the gender dimension of education policies
6. Strengthening R&D as a precondition for improving women’s opportunities and prospects in science
7. Enhancing south-south and north-south cooperation on gender and science
8. Adopting an effective strategy for inclusive development and gender equality

(The recommendations are fully developed in the previous section S&T results)

3.5 Final conference

The objectives of the final Euro-Mediterranean conference were to present the main findings of the project, to debate its policy recommendations and to discuss further ways for strengthening Euro-Mediterranean research cooperation on gender and science in the years to come.

All the SHEMERA partners contributed actively to identify relevant speakers. One gender expert and one policy maker from each AMC were invited to participate. European partners contacted relevant gender experts and policy makers to attend the conference. The conference was widely disseminated in Morocco among academicians, policy-makers, gender experts and university students.

Under the title "Gender and science - Time for action", the conference was held on October 20th 2014 at the Faculty of Arts and Humanities of the University Hassan II Casablanca in Mohammedia, Morocco. It adopted the character of a high-level participatory seminar with about fifty participants - mostly gender experts, academicians and policy-makers. The SHEMERA researchers were in charge of chairing and facilitating the diverse sessions of the conference.

Attendees were welcomed by Prof. Idriss Manssouri, the President of Hassan II University of Casablanca, and the coordinators of the SHEMERA team in Morocco, Profs. Rachida Nafaa and Amina Bettachy.

The initial session "Setting the scene" focused on the presentation of the research results of the project by Prof. Danièle Meulders. Her presentation was followed by an active debate on the relevance of this project in the Arab Mediterranean countries and the need to support Euro-Mediterranean cooperation on gender-related issues.

The following session "Working on gender and science issues in the Arab Mediterranean countries" provided the opportunity to share insights and exchange views on existing national activities in the field of gender and science. For each AMC, a relevant initiative was presented by one of its protagonists. The selected initiatives were indicative of the wide range of activities under way:

- The objectives and most relevant activities of the Algerian chair “Women, sciences and technologies” at the Université Sciences et Technologie Houari Boumediene, were presented by its director, Prof. Farida Khammar
- Dr. Leila Saadé, Professor of Law at the Lebanese University, member of the Scientific Board of the Agence Universitaire de la Francophonie (AUF) and coordinator of the AUF Network of Women in Higher Education and Research presented this new network
- Relevant representatives from women in science associations in Morocco (Prof. Mordanie Soumia) and Tunisia (Prof. Oum Khalthoum Ben Hassine) presented their aims and most relevant activities.
• The activities of well-known women's institutes in Jordan and Palestine were presented by some of their members: Prof. Amal AlKharouf (Center for Women's studies at the University of Jordan) and Dr. Ghada Karaki (Institute of Women's studies at the University of Bizeit)
• Prof. Bahia Saheen, responsible of the National Council for Women and Ombusdam office in Alexandria, presented the activities of this council.
• Prof. Hayat Touchan presented the situation of women in Higher Education in Syria and the gender-related activities carried out at the University of Aleppo.

This session was followed by a roundtable addressed to the recommendations of SHEMERA: SHEMERA researchers presented the policy debate developed at the national seminars and the Euro-Mediterranean workshops and the policy recommendations of the project. The conference ended with a roundtable of policy makers in which representatives of universities and public bodies from the Arab Mediterranean countries were invited to discuss the recommendations of the project.

[Figure 9: Programme of the final conference "Gender and science - Time for action"]

4. OTHER DISSEMINATION ACTIVITIES

4.1 Project logo

The project logo was designed at the beginning of the project. It has been used in each official document and promotional material.

[Figure 10: Project logo]

4.2 Website

The website of the project was developed at the beginning of the project and has been regularly updated.

4.3 Database

The aim of this task was to create a searchable online database to enable access to the informed bibliography elaborated in work package 5. The model of reference for this database was the GSD (Gender and Science Database of the 'Meta-analysis of gender and science research: http://meta-analysisofgenderandscienceresearch.org).

The database has been developed using the open repository platform DSpace. DSpace is the software of choice for academic, non-profit, and commercial organizations building open digital repositories. It is free and easy to install "out of the box" and completely customizable to fit the needs of any organization. DSpace preserves and enables easy and open access to all types of digital content including text, images, moving images, mpegs and data sets. And with an ever-growing community of developers, committed to continuously expanding and improving the software, each DSpace installation benefits from the next.
For the development of the Shemera database DSpace platform was greatly customized and enhanced in order to accommodate the requirements of this specific digital repository implementation. The main issues that have been addressed include modifications in the submission form in order to simplify the process, supporting multi-lingual controlled vocabularies both in metadata entry and presentation to end user and context-sensitive presentation of material as well as a range of modifications in order to encourage efficient and effective human-computer interactions and optimize the overall user experience in the repository.

The database is available at the website of the project (http://database.shemera.eu/). The home page of the database is shown at the figure 11.

[Figure 11: the homepage of MeD - GSD: Gender and Science Database in the Arab Mediterranean countries]

4.4 e-newsletter

The objective of the e-newsletter was to disseminate the research findings along the duration of the project with the aim to increase awareness on the importance of gender equality in science among scientists, policy makers and other relevant stakeholders from both shores of the Mediterranean.

As expected, 8 issues have been published along the duration of the project. They are available at the website of the project.

The e-newsletter is structured in 5 columns and one Editorial signed by the coordinator of the project. The 5 columns are as follows:

1. “In Focus” is dedicated to political and social aspects: the advancement of science in the Arab Mediterranean countries and the contribution of women to this progress.
2. “SHEMERA highlight” tells about activities developed in the project and the outcomes of the research done in the project: concerning statistics, research and policies in the different AMCs.
3. “Food for thought” gathers articles dedicated to philosophical and historical aspects of gender issues in relation with the epistemological debate in the Euro-Mediterranean context.
4. “Portraits of women scientists” is a section devoted to women scientists in the region. Each e-newsletter presents three portraits of contemporary women in science in the Arab Mediterranean countries. This column aims to valorise their role and their engagement in making science an opportunity for the development in their country and in the entire Mediterranean area. Each portrait presents a brief biographical profile and a picture.
5. “Horizons” presents examples of international collaborations with/for women scientists in the Mediterranean, as well as some news and events on these issues.

According to the workplan, the e-newsletters have been published on the SHEMERA website and diffused to a mailing list of stakeholders provided by each partner.

The e-newsletter has been a collaborative product developed with the involvement of SHEMERA partners and experts in the Euro-Mediterranean context. Each partner provided contacts and suggestions for the identification of women scientists in the different AMCs; some of these contacts were also invited to write
The set of portraits of women in science in the Mediterranean has been edited at the end of the project as a dissemination material to acknowledge and valorise the role of women scientists in the Mediterranean. The 24 portraits (previously published in the e-newsletter) try to achieve a balance between scientists of past and present, national background and fields of science.

4.5 Specific dissemination activities

- Presentation of SHEMERA at Gender Summit, November 2011, with a poster (by CIREM)
- Presentation of SHEMERA at EPWS session at European Parliament, January 2012 (by CIREM)
- Presentation of SHEMERA at the Annual meeting of the Italian Association for Women and Science in Siena, October 4-5, 2012 (by IDIS)
- Presentation on SHEMERA at the general Assembly of the European Centre of Women and Technology on 13rd of July, 2012 (by Tetalap & Bay Zoltan)
- Presentation of SHEMERA at the association of Hungarian Women in Science Presidency meeting on 6th of September, 2012 (by Tetalap & Bay Zoltan)
- Presentation of SHEMERA at the general assembly of the Hungarian Women’s Lobby on 16th of November, 2012 (by Tetalap & Bay Zoltan)
- ASRT organized the Women in Science international conference in Egypt (Cairo), under the title ‘Current Challenges in Women’s Health Care and Medical Research’, which was supported by UNESCO. ASRT devoted a session inside this international conference to present SHEMERA to the audience, in cooperation with CIREM. Additionally, ASRT distributed 200 leaflets of SHEMERA and positioned 2 posters inside the conference.
- Presentation of SHEMERA at the ECSA - EUSA annual meeting, Maryland USA, May 2013 (by USJ)
- A SHEMERA information sheet was prepared in English and Hungarian and these were uploaded to the [http://www.bayzoltan.hu/bay-kki/referencia-projektek website](http://www.bayzoltan.hu/bay-kki/referencia-projektek) (by Tetalap & Bay Zoltan)
- Maria Caprile (ULB) presented SHEMERA as moderator of the session 'Inclusive societies and science in/for society' at the MED Launch of H2020, February 9th 2014, Cairo. A poster of SHEMERA was also prepared for this event.
- SHEMERA team members in Lebanon (USJ) participated to the event «Voix de femmes: Mosaique de paroles» which took place on March 11th-12th 2014 at Collège Protestant Français in order to celebrate the International day of women. They presented the project and the main results to high school students, principals and teachers.
- Prof. Sihem Jaziri (FSB) published an article in a Tunisian mass media (Leaders) on March 14th 2014. The article dealt with scientific research in Tunisia and other Arab countries, addressing both epistemological, policy and organisational issues, including the need to strengthen women's position in science ([http://www.leaders.com.tn/article/13565-reflexion-sur-la-recherche-scientifique](http://www.leaders.com.tn/article/13565-reflexion-sur-la-recherche-scientifique))
- ITU organized and hosted the 4th European Women Rectors Conference on "Beyond the Glass Ceiling: Women Rectors Across Europe, Role of Leadership in Structural Changes" in Istanbul on May 15th-17th 2014 and invited Maria Caprile (ULB) to present the SHEMERA project in the conference programme.
• Prof. Bahia Shaheen and Dr. Sara Hanafy (AU) participated at the following events: Workshop “Equal opportunities in Higher Education: Egypt and Germany in Comparative Perspective” organized by Freie Universitat Berlin Cairo Office and the German Academic Exchange Service (DAAD); Workshop "Gender Equality in the Egyptian Higher Education System"- German Academic Exchange Service (DAAD) and Free University of Berlin, held at TU Berlin Campus, EL Gouna (June 15th-19th 2014), under the International Summer School "Gender in Teaching"

• At the end of the project, CIDDEF prepared a special issue of its journal devoted to the SHEMERA project and its most relevant results for Algeria. A thousand copies have been distributed mostly among ministries and public bodies.

• IWS organised a round table discussion related to the final findings of the SHEMERA project on November 17th 2014 in the Institute of Women Studies (IWS-BZU). All IWS academic staff and consulting board members participated.

• The SHEMERA team in Syria (ALEPPO) published and article about the project at the University's journal, Aafak. At the end of the project, the team held a session with Aleppo University Council to discuss the recommendations made by Shemera. The creation of a Centre for Women's studies at the University is under preparation.

• The women in science association in Morocco has become partner of the Faculty of Arts and Humanities of the University Hassan II Casablanca in Mohammedia. Some of their members participated at the 5th IUPAP International Conference on Women in Physics (August 5th-8th 2014, Canada). Other women's associations in Morocco have shown their willingness to include among their objectives to achieve an equal representation of women and men in decision-making positions in higher education and scientific research.

• The SHEMERA newsletter and other project news have been regularly disseminated in Jordan through the website of WSC at the University of Jordan.

• Sile O’Dorchai and Maria Caprile (ULB) will present the findings of the SHEMERA project at the International Conference “Women in the Academic World “ (March 25th-27th 2015), organised by Paris Diderot University and Paris Sorbonne Nouvelle University.

List of Websites:
Website

http://www.shemera.eu/

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