Euro-Med Cooperation on Research and Innovation

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The Policy Framework for Research Collaboration in the Mediterranean: A Politically Saturated Space

Scientific cooperation (as opposed to collaboration) appears when support programmes actively promote scientific collaboration at the international level. Scientific cooperation activities are promoted by both international and national institutions. International programmes and national agencies working at the international level, design, fund and sustain these cooperation programmes. Although the discussion on global research programmes has arisen from the urgency of tackling global societal challenges in the Euromed area, it is also based on diplomacy, historical and cultural ties between countries, and political objectives. The new global hierarchy, based on a multipolar world,[1] exacerbates the opposition of, on the one hand, "science for science's sake" – and the predominance of criteria of "excellence" mainly present in hegemonic countries – and, on the other hand, "science for development" – and the defence of "pertinence." Of course, excellent research does not necessarily bring about good development, and development is not always linked to excellent research. It is rather a question of defining a clear strategy and enabling an environment that satisfies developmental needs. Thus "science for development" or "science for innovation" can in no way be opposed to "science for academic excellence."

International scientific collaborations are now part of a world science system that has profoundly changed in its 'governance': decisions are no longer limited to the official authorities (governments, international agencies, European Union) but now include the many players of the new learning economy. Final users of science (people suffering illnesses in medical research, rural populations in agricultural science projects, enterprises in innovation policy, and so on) intervene actively in defining research agendas. Large funding agencies act at the global level and are no longer limited by national boundaries.[2]

The case of the Euro-Mediterranean region raises questions such as: How is this competence market structured? Who are the main actors? How is this new hierarchy of competences expressed and how does it translate into policies and the current dynamics of science. Given the history of the Mediterranean Basin, it is no surprise to find a multiplicity of competing agendas, agencies and organisations in the field of research, as well as a wealth of research programmes on the Mediterranean area, executed by foreign and local research teams. Bilateral cooperation has usually been the product of former colonial linkages, and the advent of a national science in Southern and Eastern Mediterranean countries, the product of independence. Most scientific relations in the region have been embedded in this political framework. It is only for the last 20 years that the EU has appeared as a major player in this institutional

[1] A description with a world map of the new global distribution of scientific production can be found in the *Atlas du Monde Diplomatique* (2012), pp. 70-73.
[2] An analysis of this multipolar scientific world can be found in Losego and Arvanitis (2008). A detailed analysis of these changes are to be found in the white Paper 'Assessment of international scientific cooperation in the Mediterranean region', MIRA Observatory (2011).

space, which is literally saturated by institutions aimed at promoting cooperation.

Cooperation with the EU

Research cooperation with the EU takes place in the more general policy framework of Euromed cooperation. Initially this political framework was defined by the Barcelona Declaration (1995), which was later replaced by the European Neighbourhood Policy (ENP), aimed at a larger scope than the Mediterranean in order to include all neighbouring countries of the EU.

The principal financial instrument for cooperation has been the European Neighbourhood Policy Instrument (ENPI), with almost €12 billion for the period 2007-2013, which replaced MEDA funding in the Mediterranean. As well as research activities, the European Commission (EC) has assigned substantial funding through structural programmes. A Cross-Border Cooperation (CBC) Programme for the Mediterranean Sea Basin has also been defined which is funded by the ENPI, and the European Regional Development Fund (ERDF). The funding available for 2007-2010 was €583 million, which included €275 million from the ENPI and €308 million from the ERDF (Data from Euromed Expert Group Report). This is not the time to judge the impact or efficiency of these decisions, but it is important to point out that the EU has a strong commitment in the region and it comes as no surprise to see that the research activities form part of this political and cooperation framework.

In the Barcelona Process a number of policy instruments have been designed: the Monitoring Committee on S&T policy (also known as MoCo); the introduction of science and technology in the Association Agreements between the EU and the Mediterranean Partner Countries (MPCs), signed in the context of the ENP; the activities in Brussels of the International Cooperation division (INCO); some policy-oriented projects funded to develop the latest science, technology and innovation systems in the region (ASBIMED and ESTIME, as well as other projects on forecasting and innovation in MPCs); a series of specific 'instruments' specially designed for international cooperation in science (INCONET, BILAT, ERAWIDE, SICA…); and the creation of a network of National Contact Points for EU-MPC scientific collaboration.

With regard to research and education, political commitment was shown for the former at a Euro-Mediterranean Ministerial Conference on Higher Education and Research held in Cairo in June 2007,[3] which stressed the need to move toward the creation of a "Euro-Mediterranean Research and Innovation Area" by:

- modernising the R&D policies in the MPCs
- supporting institutional capacity building
- enhancing the participation of the MPCs in the Framework Programme (FP), while taking into account their particular needs and mutual interests and benefits
- promoting innovation in the MPCs by enhancing the exploitation of society and industry's Research and Technology Development (RTD) outputs
- favouring researcher mobility

These objectives were given fresh emphasis at the annual meetings of the Euro-Mediterranean Monitoring Committee for RTD (MoCo) which outlined the principles of "demand-driven" and "impact-driven" EU-MPC cooperation based on "co-ownership" and "co-funding." As a result of these evolutions, the EC now underlines the need for a 'renewed partnership' in science, technology and innovation.

Collaborations as Seen through Co-Publications in the Region

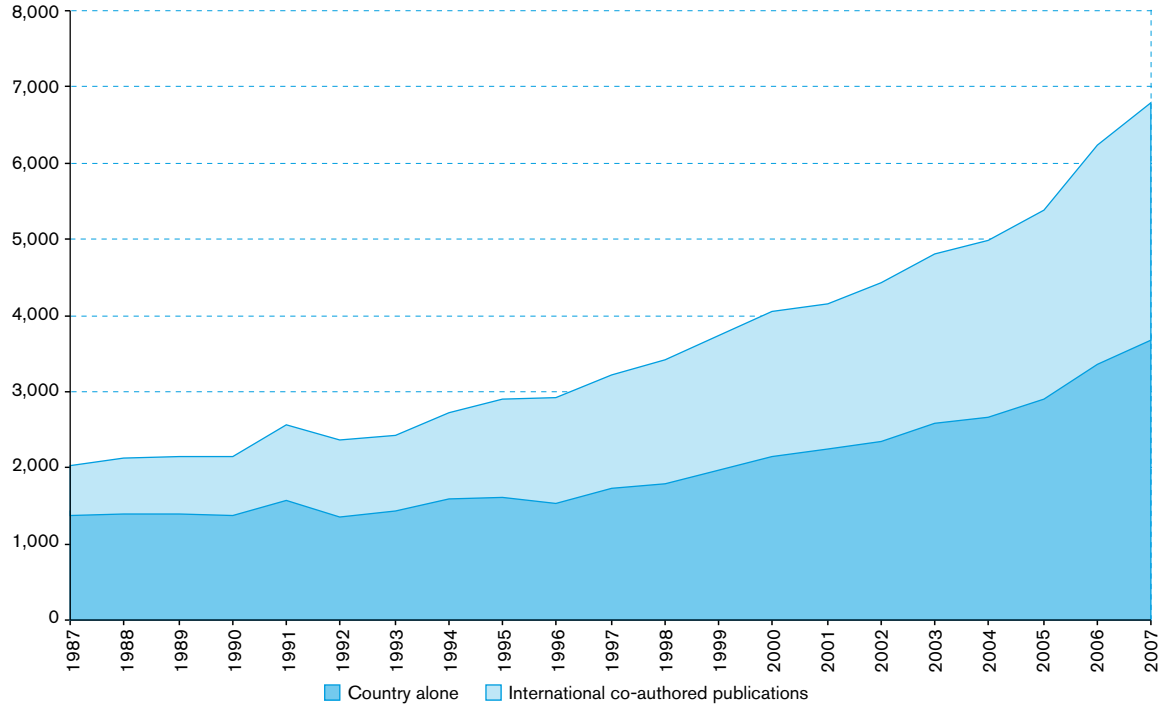
A simple way to measure scientific collaborations – although neither complete nor the only way – is by measuring co-authored articles (Gaillard, J., 2010a). Co-publications in the region, as seen from the southern and eastern sides of the basin, are shown in Chart 33. As we can see, the overall production has grown considerably and co-publications from most countries with researchers from the EU[4] have grown in even higher proportions.

This is true of all countries, but co-authorship patterns are very different from one country to the oth-

[3] See Cairo Declaration: http://ec-europa.eu/research/iscp/pdf/cairo_declaration.pdf

[4] Analysis done on the 17 first EU Member Countries.

CHART 33 **Publications and Co-Publications of Some Non-European Countries of the Mediterranean Region**



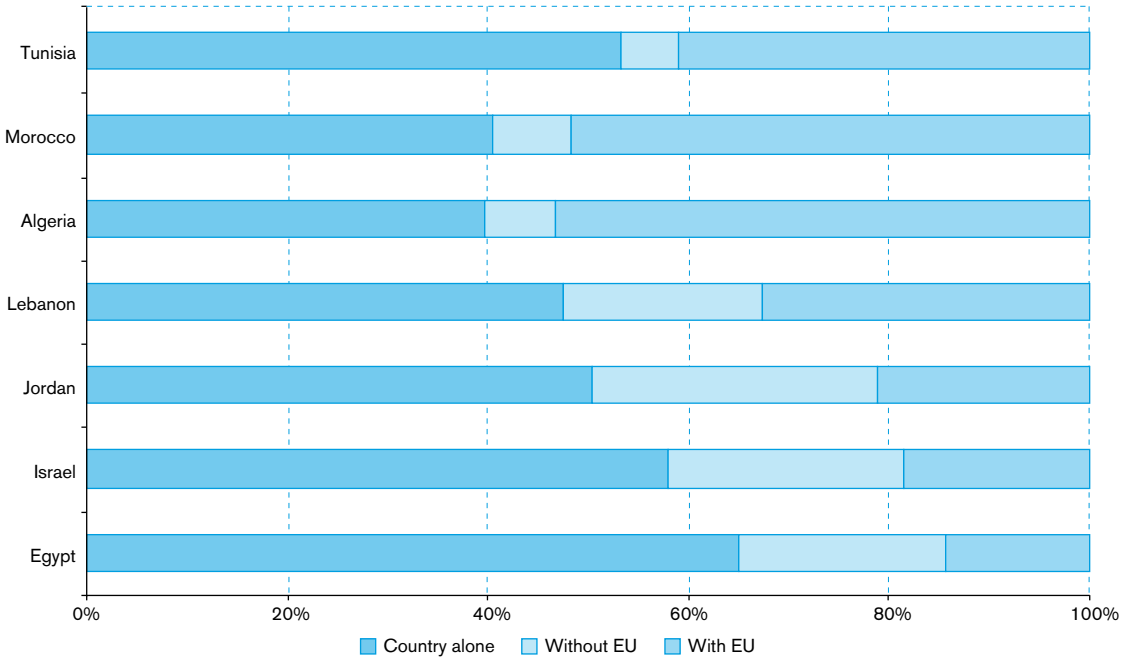
Source: SCI Extended - Thomson Reuters. Treatment PL Rossi, IRD. This chart contains the publications of Morocco, Tunisia, Algeria, Egypt, Jordan, Lebanon, Syria and Israel.

er. Egypt (with 35% of co-publications) in 2007 still has a low proportion of co-publications, while Israel has a very open scientific community with 42%. Smaller countries like Jordan (49%) and Lebanon (52%) have higher levels of co-publications with researchers from foreign countries. Maghreb countries also have higher proportions, mainly with France. Tunisia, the region's fastest growing country in scientific production, has the lowest level of co-publications (47%) of the Maghreb countries; while Morocco and Algeria, with a proportion of 60% of co-authored articles, could be considered to be too open to cooperation. When growing, co-publications tend to diminish relatively (but not in absolute terms). In fact, the overall pattern of French-speaking Maghreb countries is similar: co-publications with France have grown but proportionally less rapidly than overall production, and new partners are appearing from outside of Europe (mainly from the US and Canada) and from inside (Spain, Italy and Germany).

It is interesting to note that the specialisation pattern of these countries' publications, largely oriented towards chemistry, physics and engineering, is different from European countries. They also favour mathematics, mainly in the Maghreb and Lebanon, and, in contrast, under-publish in life sciences (biology, bio-medicine) (see ESTIME report and Waast and Rossi (2010)). Israel, Tunisia and Lebanon are exceptions in the SEM countries, since they have a relatively strong medical and biomedical base. This orientation in favour of basic biological and bio-medical research is also the general tendency of many European countries. Moreover, European countries seem to deploy more research activities in 'basic' science, whereas SEM countries seem quite clearly to prefer technologically-oriented and applied research, as confirmed by the MIRA Survey[5] on International Collaborations (Chart 35). Thus the expectations of SEM countries' researchers are more "applied" and technologically-oriented than those of European researchers. The same survey also shows that access to equipment is a stronger motivation for SEM researchers than their European counterparts.

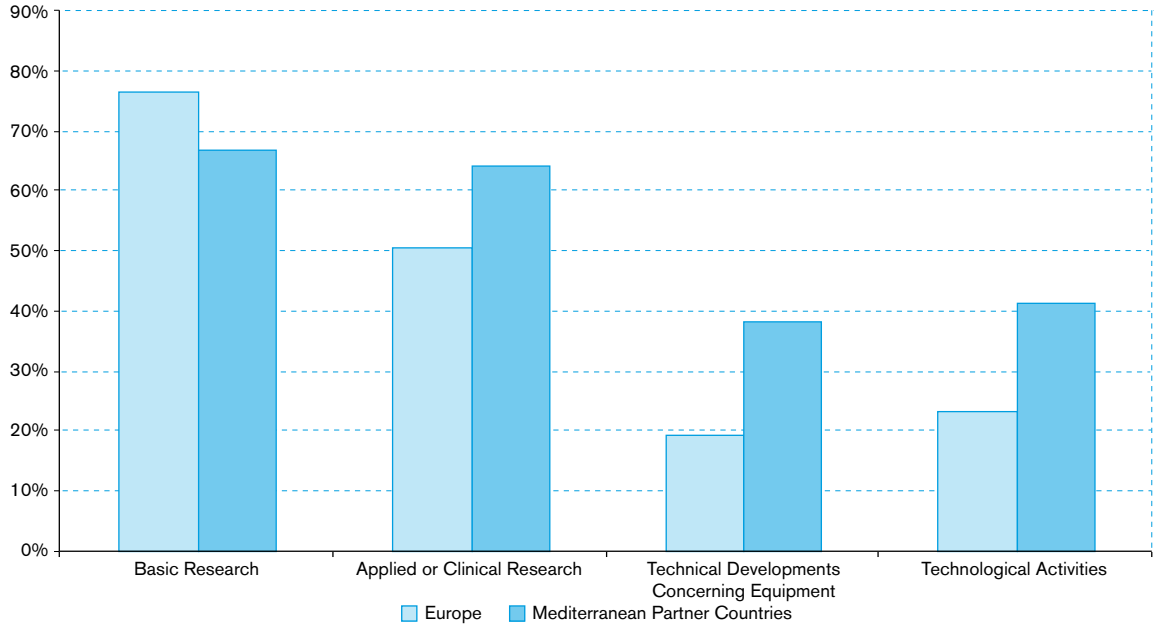
[5] Based on 4,187 responses, 2004 from European countries and 2,183 from Mediterranean countries of a representative sample, this survey was carried out as part of the MIRA project, www.miraproject.eu

CHART 34 **Publications and Co-Publications of Some SEM Countries with or without EU Partners (2007)**



Source: SCI Extended - Thomson Reuters. Treatment PL Rossi, IRD.

CHART 35 **Type of Research in Research Collaborations (MIRA Survey)**



Source: MIRA Survey Percent responses to the question: "*Could you indicate the relative importance of each type of research in your collaborations?*" as "important" and "major contribution to this type of research" (unpublished report, MIRA project)

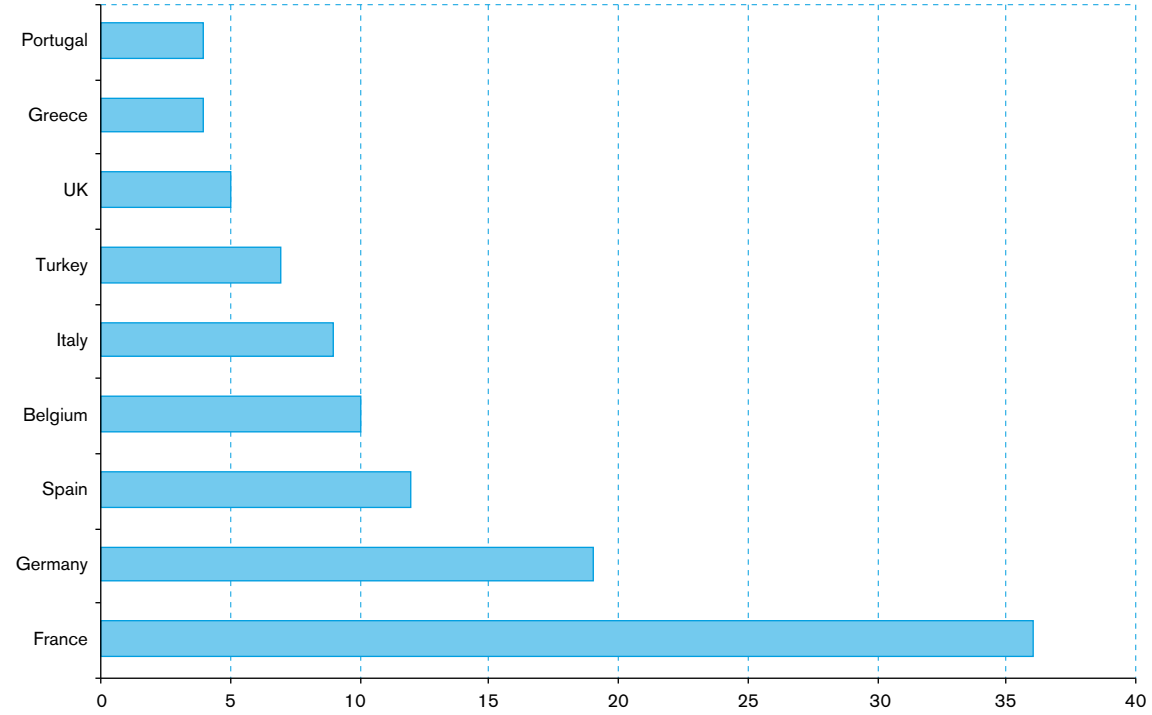
These specialisation patterns are very important for two reasons: a) countries usually tend to reinforce their specialisation over time rather than diversify, and b) research and technological development are activities that are "path-dependent," thus feeding on previous work and accumulated competences.

Participation in Cooperation Programmes

Bilateral Cooperation between European Countries and Mediterranean Non-European Countries

Bilateral cooperation concerns activities (in research or other fields) that involve two countries

CHART 36 **Bilateral Cooperation Agreements as Seen from the Side of European Countries: Number of Cooperation Agreements with SEMCs**



Source: ASBIMED Final Report. The Chart represents 124 agreements as of June 2006.

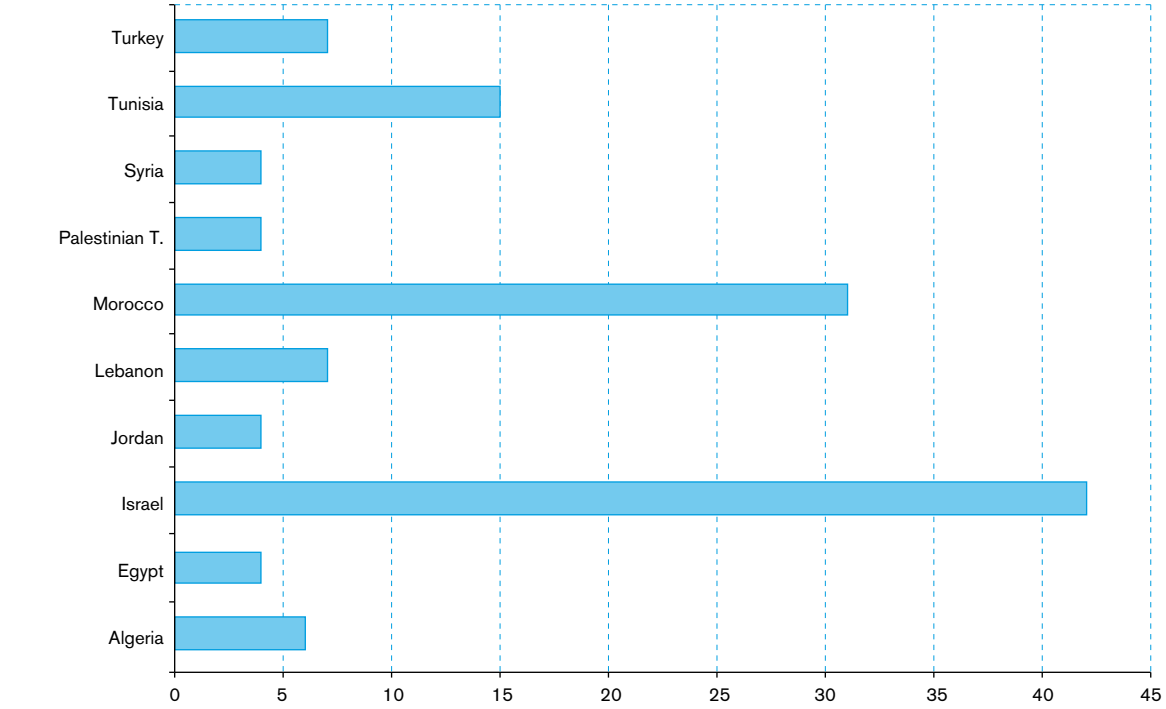
under a legal framework. Usually some general cooperation agreement exists, at a "higher" diplomatic level, and specific agreements are later proposed and signed as the needs arise. Chart 36 shows the number of bilateral agreements after a census made in 2007 (Rodríguez-Clemente, R. et González-Aranda, J.M., 2007). It tells the story of cooperation agreements in science and technology that were still in force at the time of this survey. This is a one-off survey that has not been renewed. The number of these agreements (124 agreements) is relatively high and there are certainly more of them. Most agreements are those made by public entities, involving universities and governmental structures, but many more agreements that are signed between universities for example, or between private entities on both shores of the Basin are absent from this statistic. One of the difficulties concerning these agreements is their scope and their duration. The agreements are usually not very specific: they just name a domain and some general conventions on possible means that can be mobilised (mobility of researchers, students, co-direction of doctoral thesis, budgeting and so on). As can be seen, the main players are France, Germany, Spain, Belgium and Italy. It is worth mentioning that France has a tradition of signing framework agreements – not only in the Mediterranean region – and that its research institutes (CNRS, IRD, INRA…) that are active in the region are public research institutes, whereas other countries usually mobilise universities.

On the side of the SEM countries, Israel and Morocco dominate this area, followed by Tunisia. Algeria, Lebanon (mainly with France) and Turkey have more or less the same number of agreements. Morocco has been trying since the late nineties and early 2000 to prioritise research (Kleiche, Waast 2008 et 2009). Moreover, as mentioned, Morocco has a history of collaborations with France, but is now extending its cooperation to other European countries and to Canada. Morocco is driving a policy of close relationships with Europe mainly through 'Twinning projects': one of these twinnings concerns Science and Technology and another concerns Intellectual Property Rights

EU-Sponsored Research Programmes

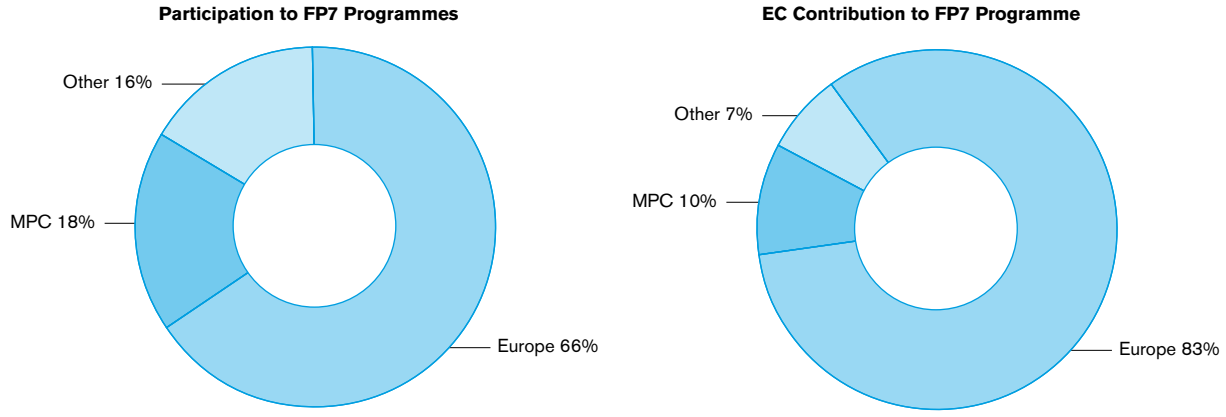
At the project level, research is mainly funded through the 7th Framework programme. A recent

CHART 37 **Bilateral Cooperation Agreements as Seen from the Side of Partner Countries: Number of Cooperation Agreements with European Countries**



Source: ASBIMED Final Report. 124 Cooperation agreements.

CHART 38 **EU-Funded Projects under the FP7 Programme: Participation and European Commission Contribution**

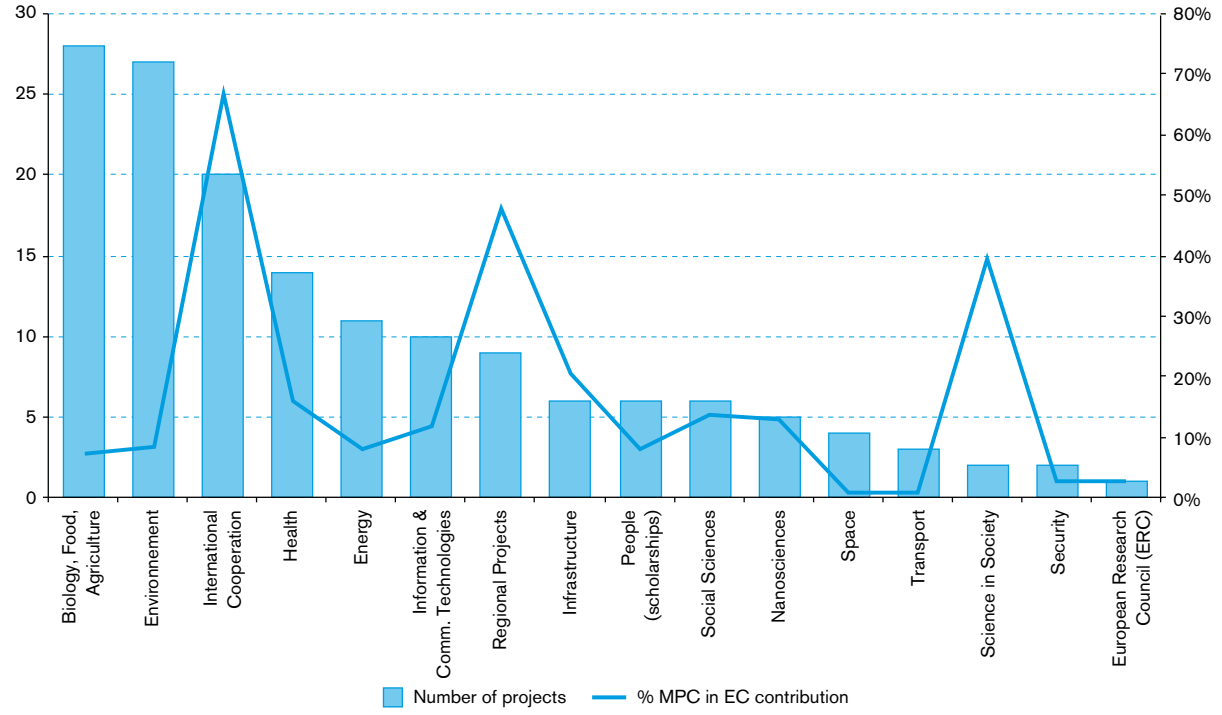


Source: CORDIS database as of Nov 2011. 151 projects for a total amount of €426 million of which MPCs represent €43 million.

report[6] indicates a total amount of €430 million in 168 projects in the region. But this amount covers the expenditures of both European and Mediterranean units. On a slightly more limited sample concerning 151 projects we have determined the distribution of funds as is shown in Charts 38 and 39. Mediterranean countries receive €43 million (10%) from €426 million. The percentage of participation would be even smaller if we put aside the "institutional" or capacity-building projects that are not research projects but policy-oriented platforms, as is the case of international cooperation projects (known as "INCOnets", "BILATs" and "ERAWIDE" projects).

[6] European Commission, *International Cooperation with Mediterranean Partner Countries in FP7 - Project synopses*. Brussels: DG Research and Innovation (EUR 25015 EN), March 2012.

CHART 39 **EU-Funded Projects under the FP7 Programme: Participations and EC Contribution by Theme**



Source: CORDIS database as of Nov 2011. 151 projects for a total amount of €426 million of which MPCs represent €43 million.

Thus, FP7 projects are mainly aimed at funding European teams working with Mediterranean partner countries. This seems to be a coherent outcome for an instrument that was designed to serve European research. However, we are still a long way from the principles that have been outlined in the Euro-Mediterranean common research policy.

Research fields where active cooperation takes place can be easily identified (Fig 7). It should be noted that the domains where the EU contribution received by the MPCs is higher does not correspond to the number of projects by domain. This is an important result because it denotes a discrepancy between what is programmed and considered important by the EC and the actual participation of the non-European partner countries.

When looking backwards on the whole process, which involved a substantial amount of time and resources, the exchanges between the EU and Mediterranean countries have remained at a political level and there has been little leverage effect with stakeholders outside of governments or public institutions. Simultaneously, the diplomatic effort that has been deployed under the umbrella of the Union for the Mediterranean has been rather slow and has not had the boosting effect that was expected from such a wide-reaching policy framework.

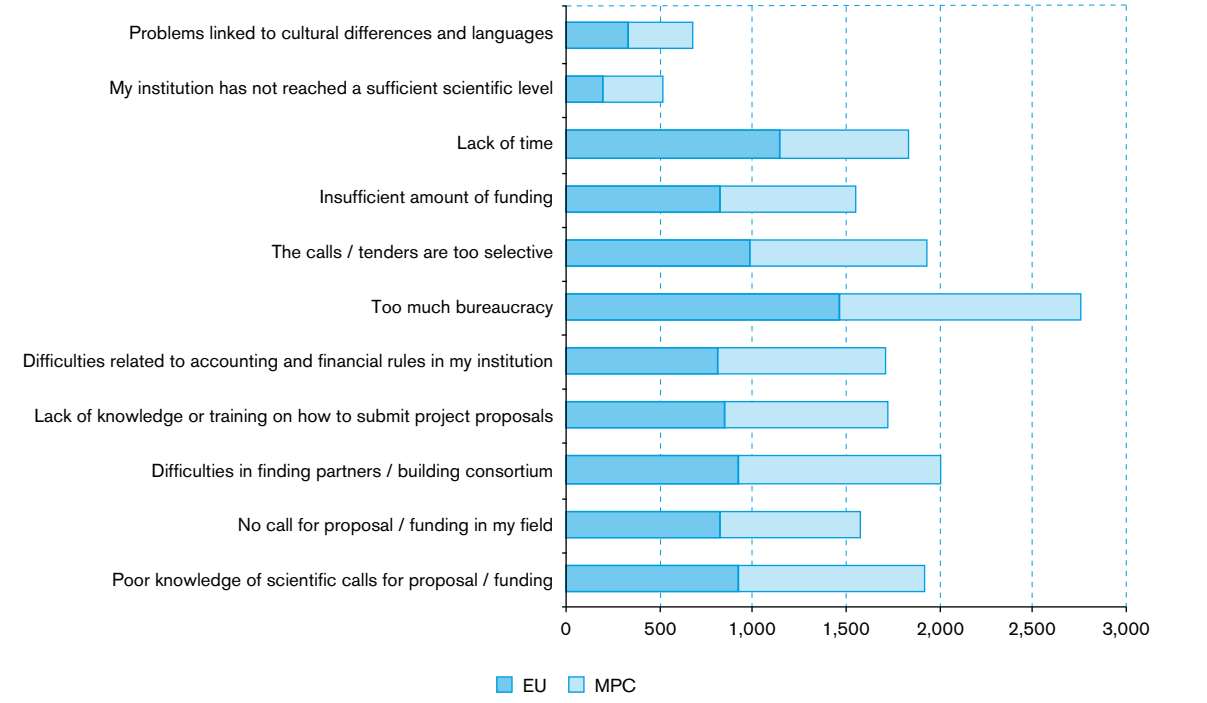
TABLE 11 **Framework of Collaboration of Scientists from SEMs**

Framework of Collaboration	N	%
Without Official Framework	1,104	58.5%
Bilateral Cooperation	920	48.8%
International Project	461	24.4%
EU Project	402	21.3%
Foreign Public Project	234	12.4%
Foreign Private Project	51	2.7%
Arab Funded Project	90	4.8%
Total Responses to the Question	1,887	

Source: MIRA survey on collaborations - Multiple answers possible.

In order to understand the relative importance of these types of collaboration frameworks we can refer to the results of the MIRA survey (www.miraproject.eu) on scientific collaborations. As can be seen in Table 11, more than half of the scientists questioned mention that their collaborations have taken place outside of an official framework. Practically half of the respondents also mention that they have collaborated within a bilateral framework. EU projects account for one fifth of the responses. The survey also suggests that 61% of Europeans and 49% of Southern and Eastern Mediterranean scientists are responding to calls for projects,

CHART 40 **Main Factors Limiting Participation to International Projects**



thus making project funding a common practice.
As stated recently in a semi-official document,[7] "A pending issue is how to connect the two core components of this cooperation: bilateral cooperation activities between EU Member States and MPCs, and actions funded by the European Union through various means, mainly the ENPI and the EU Framework Programme (FP) for Research. A clear political mandate is needed to advance in the search for synergies, as there is a generalised view that the tools and resources available to scientific cooperation policies do not yield the expected results." (Coordination of research… p. 2) The MIRA survey confirms this statement. Chart 40 shows the opinions expressed by researchers from both European and Mediterranean Partner Countries concerning the factors limiting their participation in international scientific calls for proposals/funding.
As can be seen, 'bureaucracy' is considered the main burden and, paradoxically, is believed to be a more limiting factor in Europe than in Mediterranean Partner Countries. Nonetheless, on the whole, all scientists, from the north and south, believe there is too much influence from the administration. Besides this aspect, it is clear that partnerships are not very easy to create, let alone manage.

Conclusion: an Unfit Ideal

There are several reasons for this unsatisfactory situation of Euromed cooperation in science. Firstly, there is a series of structural aspects concerning the role of research. Research is still not a priority for most SEM countries, nor for the European Union. As the ESTIME project found (Arvanitis, R., 2007), with the notable exceptions of Tunisia (among Arab countries), Turkey and Israel, most research teams have a hard time obtaining the necessary legitimacy in their institutions, usually universities, which are devoted to training rather than research. The MIRA survey, which offers data on the time devoted to both research and teaching and allows us to draw comparisons between researchers from European and Mediterranean countries, is quite illuminating. In Europe, there are more researchers devoted solely to research, and among university researchers, there are more peo-

[7] In the background paper of the EU-Med Conference (2-3 April 2012):

ple spending more time on research. On the contrary, researchers from SEMCs on average spend more time on teaching, administrative tasks and clinical practice.

For the EU, as the UfM has shown, research is among the very few areas where one finds actual and effective linkages and real cooperation between the northern and southern shores of the Mediterranean; although, these are rather thinly spread and still not as widely accepted as they should be.

It might be more satisfactory to focus on policy rather than the abovementioned "structural" difficulties. As we have seen, highly demanding needs are necessary to enhance EU-Med cooperation in science and technology. As far as EU-Med research cooperation is concerned, everything shows the need to design a *regional programme for science, technology and innovation* where the different components could be fitted into a global strategy. Building on the successful experience of some EU-sponsored bilateral programmes, a dedicated regional initiative that would aim at developing the collective capacity to address socioeconomic challenges would significantly contribute to the achievement of a shared vision. To the benefit of the EU, it is necessary to stress that the Commission is actively seeking a way to implement such a regional programme today as demonstrated by the conclusions of the last Euromed Conference on Research and Innovation, which took place in April 2012 in Barcelona. Moreover, a clear need has been expressed in various political arenas (interministerial meetings, MoCo, bilateral programmes, etc…) in finding a bridging mechanism between the needs of Southern and Eastern Mediterranean and EU countries concerning innovation.

Integrating European partners and MPCs in a common research and innovation strategy could also be aimed at creating a Euro-Mediterranean Innovation Space (Pasimeni, et al., 2007).[8] It would be in line with the commercial activities between both sides of the Mediterranean: more than 50% of the trade of the MPCs is with the EU, and for some countries the EU represents the destination of more than 70% of their exports. Europe is the largest direct foreign investor (36% of total foreign direct investment) and the EU is the region's largest provider of financial assistance and funding, with nearly €3 billion per year in loans and grants. Moreover, recent surveys on industrial innovation in Morocco and Tunisia show that industry is aware of innovation and sustainability issues. More generally, Maghreb countries have been very actively engaged in testing these policy measures that support networking of competences (Arvanitis, R. et M'henni, H., 2010).

But the most important reason why research and innovation should be developed jointly in a long-term strategy lies in the specialisation patterns of Southern and Eastern Mediterranean countries (SEMCs); any strategy needs to build on these capabilities and not only on those developed by European countries.

This Euro-Mediterranean innovation space should thus create shared research-oriented activities on both sides of the basin. Whatever its name or political backing, hope should be placed in creating such a regional initiative that could play an important role in addressing the urgent demands of the population, youth and the aspirations for more democratic societies on all sides of the Basin.

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[8] See MIRA project www.miraproject.eu for recent evolutions of this EMIS.

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